

No. 866,764.

PATENTED SEPT. 24, 1907.

J. McE. AMES.
TRANSPORTATION CAR AND THE LIKE.

APPLICATION FILED APR. 23, 1906.

3 SHEETS—SHEET 1.

Fig. 1

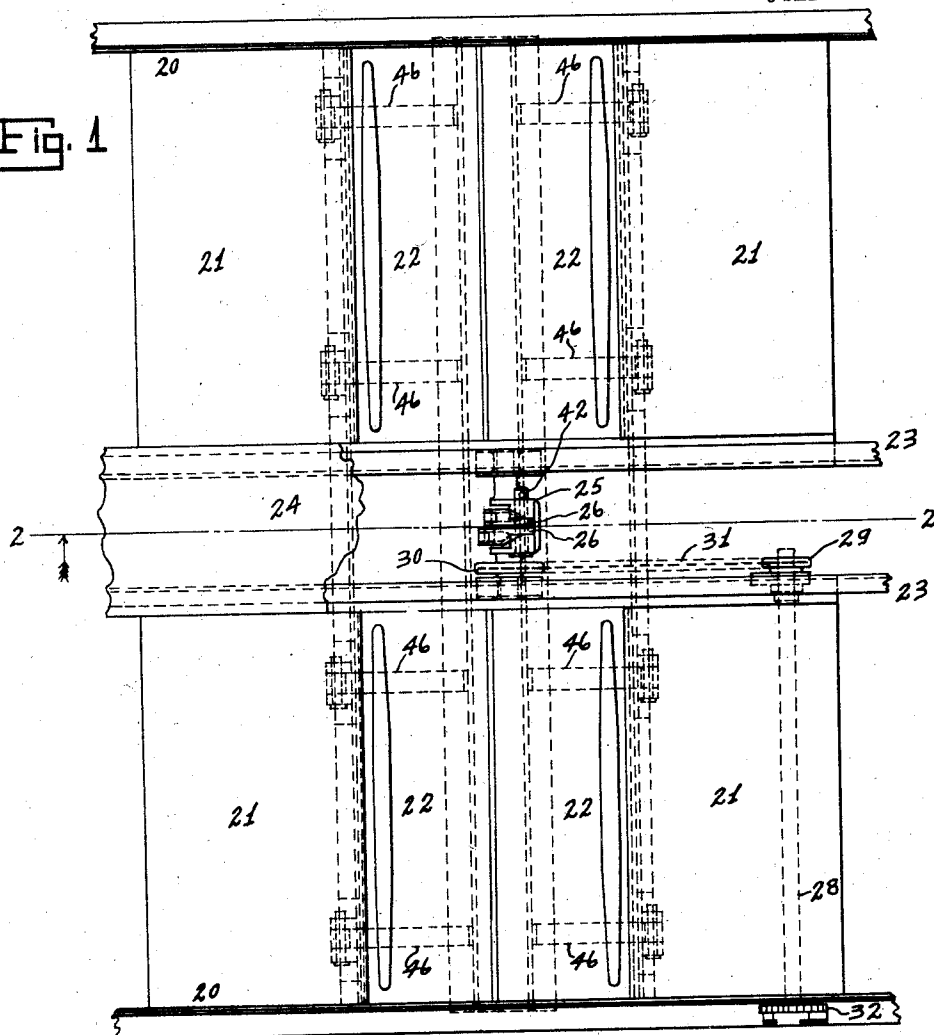
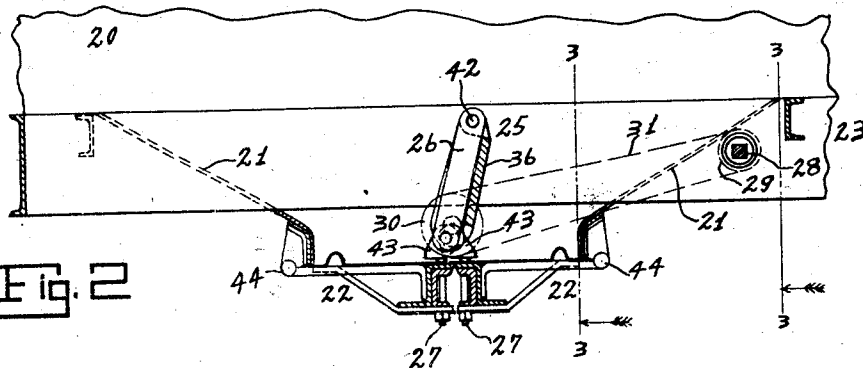


Fig. 2



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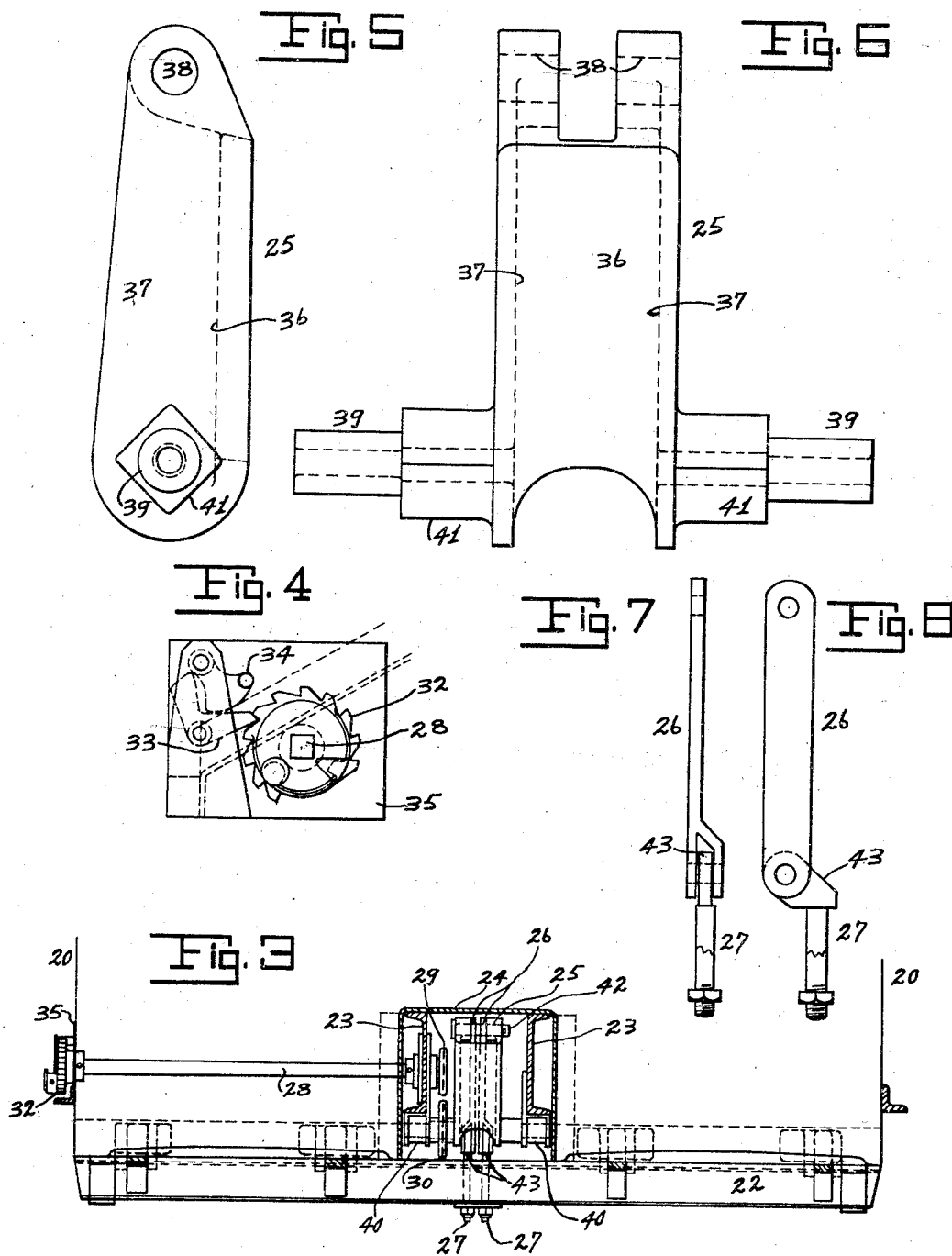
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3 SHEETS—SHEET 3.

Fig. 9

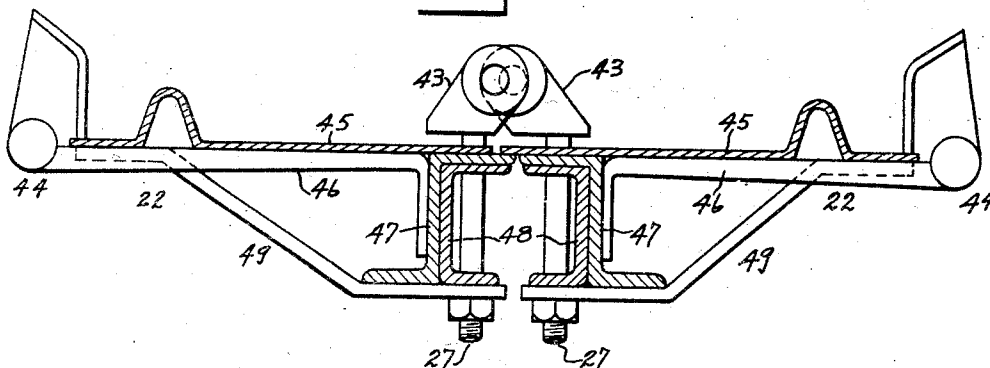


Fig. 10

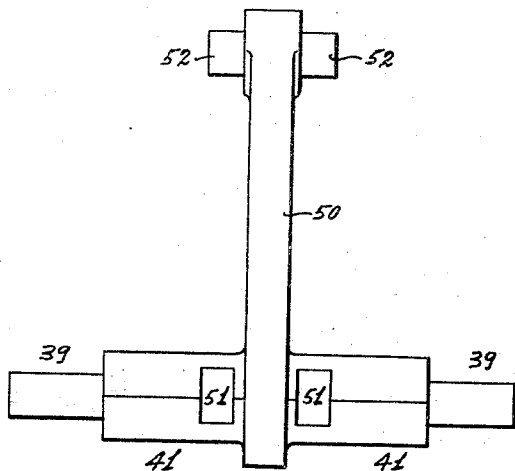
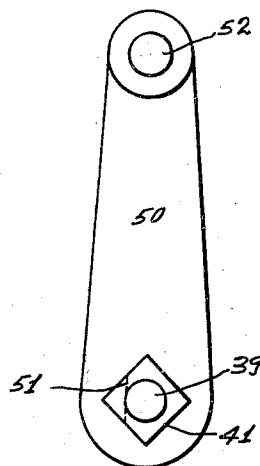


Fig. 11



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UNITED STATES PATENT OFFICE.

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TRANSPORTATION-CAR AND THE LIKE.

No. 866,764.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed April 23, 1906. Serial No. 313,174.

To all whom it may concern:

Be it known that I, JOHN McE. AMES, a citizen of the United States, and a resident of New Brighton, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Transportation-Cars and the Like, of which the following is a specification.

The invention relates to improvements in transportation cars and the like, and it consists in the novel mechanism hereinafter described for opening, closing and locking the discharge gate or gates at the bottom of the car.

The object of my invention is to provide an efficient, easily operated and durable mechanism for closing and opening the discharge gates of the cars and for locking said gates in their closed position, and in carrying out my invention I provide between the center sills or draft sills of the car a pivotally mounted crank-frame connected by links with the hinged gates and operate the same from a transverse shaft located at one side of the gates and below one inclined floor-section of the car, this shaft having on its outer end means whereby it may be rotated in either direction and at its inner end carrying a sprocket wheel which is connected by a chain with a sprocket wheel secured upon said crank-frame, whereby motion may be communicated from the said operating shaft to the said crank frame for opening and closing the discharge gates.

It is of advantage to locate the means for opening and closing the gates at a point removed from said gates and it also is advantageous to locate the operating shaft for the gates transversely of the car and below the floor thereof.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is a top view, partly broken away, of the middle portion of a gondola-type of car equipped with discharge gates and gate operating mechanism embodying my invention; Fig. 2 is a longitudinal section of same on the dotted line 2—2 of Fig. 1; Fig. 3 is a transverse section of same, taken generally on the left hand dotted line 3—3 of Fig. 2, but a portion of Fig. 3 being taken on the right hand dotted line 3—3 of Fig. 2 so as to disclose the operating shaft; Fig. 4 is a detached view of a bearing plate secured on the side of the car to receive the outer end of the operating shaft and the means provided thereat for locking said shaft when the gates are in closed position; Fig. 5 is a side elevation on an enlarged scale of the crank-frame shown in Figs. 1, 2 and 3 as located between the center-sills of the car; Fig. 6 is a face view of same; Fig. 7 is an edge view of one of the links by which the crank frame is connected with the gates; Fig. 8 is a side elevation of same; Fig. 9 is an enlarged sectional view corresponding with Fig. 2,

of the pair of gates detached from the car; and Figs. 10 and 11 are face and side views respectively of a modified form of the crank-frame.

I illustrate in the accompanying drawings, my invention applied to a familiar type of car adapted for carrying coal, coke and other substances, 20, 20 designating the sides of the car, 21, 21 downwardly converging or inclined floor sections leading to the discharge opening in the bottom of the car, 22, 22 the hinged gates for said opening, 23 the center-sills of the car, 24 the usual covering for said sills, 25 a crank-frame mounted between said sills and above said gates, 26 links pivotally secured at their upper ends to the upper end of said frame and at their lower ends to eye-bolts 27 respectively fastened to said gates, 28 a transverse operating shaft extending from one side of the car below one inclined floor section 21 to the space between said center-sills, 29 a sprocket wheel on the inner end of said shaft, 30 a sprocket wheel on said crank-frame, and 31 a chain connecting said sprocket wheels 29, 30 for imparting motion from said operating shaft to said crank-frame for opening and closing said gates, the outer end of said operating shaft being polygonal in outline (Fig. 4) to receive a wrench for actuating it and being equipped with a ratchet wheel 32, pawl 33 and locking dog 34 for locking said shaft when the gates 22 are in closed position, said ratchet wheel 32, pawl 33 and dog 34 being of familiar construction and illustrated in Letters Patent No. 801,459 granted October 10, 1905.

The operating shaft 28 is located to one side of the gates 22, where a person operating said shaft is not liable to become injured by the gates during their opening movement nor by any material discharged from the car, and said shaft 28 extends transversely below the inclined floor section 21 where it is out of the way and does not interfere with the proper discharge of the material from the car. The inner end of the shaft 28 has a bearing in one of the center-sills, and the outer end of said shaft has a bearing in a plate 35 applied to the sides of the car.

The crank-frame 25 is preferably an integral casting formed with a back 36, sides 37, an aperture 38 at its upper end to receive a pin, and trunnions 39 at opposite sides of its lower end to be journaled in bearings 40 secured to the center-sills 23. The trunnions 39 have polygonal sections 41 at their inner ends upon one of which is slipped the correspondingly shaped hub of the sprocket wheel 30. The aperture 38 in the upper end of the frame 25 extends transversely through the sides 37 and receives the pin 42 upon which the two links 26 are hung, said links (when the gates 22 are in closed position) being side by side between the sides 37 of said frame and bearing against the back 36.

The links 26 are plain bars and they extend below the axial center line of the trunnions 39 and are pivotally secured to the heads 43 on the eye-bolts 27, one of which is carried at the inner edge of one gate 22 and the other at the inner edge of the other gate 22, whereby one link 26 becomes connected with one of said gates and the other link with the other of said gates.

The gates 22 are hinged, at 44, at their outer edges, as usual, and comprise the metal plates 45, hinge-straps 46, Z-bars 47, channel-bars 48 (Fig. 9) and brace-bars 49. The plate 45 of the right hand gate 22 laps over upon the Z-bar 47 of the left hand gate, and this bar closes the space between the inner edges of the gate-plates 45, thereby preventing leakage between the inner edges of the gates when the latter are in closed position and the car is in transit. The eye-bolts 27 extend through the inner portions of the gates 22, as more clearly shown in Fig. 9, and the disposition of their heads 43 with respect to the links 26 is such as to insure the right hand gate, looking at Fig. 9, closing a little in advance of the left hand gate, so that the edge of the Z-bar 47 of the left hand gate may lap under the inner edge of the gate-plate 45 of the right hand gate. The complete overlapping of the inner edges of the gates I regard as an important feature, since the effectual closing of the joint between the inner edges of the gates saves a loss of the substance carried by the car and which loss has heretofore been a matter of annoyance.

In Figs. 1, 2, 3, 4 and 9, the parts are shown in the relative positions they occupy when the gates 22 are in closed position, said gates being then locked in closed position, first, by the locking of the operating shaft 28 by means of the ratchet 32, pawl 33 and dog 34, and, secondly, by the fact that the crank-frame 25 inclines to one side of a vertical line through the trunnions 39 and that the lower ends of the links 26 are pivoted on a center set off from the axial center of said trunnions and that the pull on said links by the closed gates tends to further incline said crank-frame, whereby said gates become effectually locked in closed position. The inner edges of the links 26, when the gates 22 are in closed position, have a bearing against the frame 25, which partly relieves the strain from the pin 42 and enhances the strength and efficiency of the structures.

To open the gates 22 the attendant will free the dog 34 from the pawl 33 and said pawl from the ratchet-wheel 32 and then turn the shaft 28 upwardly and toward the center of the car until, through the sprocket-wheels 29, 30 and chain 31, the crank-frame 25 has been moved from its inclined position shown to a similar position at the other side of a vertical center line through the trunnions 39, at which time the weight of the gates 22 and that of the load upon them will drive said gates to their full open position, the gates in this movement pulling the links 26 with them and causing the crank-frame 25 to turn downwardly. After the load has been discharged, the gates 22 will be closed by reversing the movement of the shaft 28 and thereby, through the sprocket wheels 29, 30 and chain 31, gradually restoring the crank-frame 25 to its upper position shown in Fig. 2, said frame 25 during its upwardly turning movement pulling on the links 26 and drawing the gates 22 upwardly to their closed position, one

gate slightly preceding the other so that the overlapping of the meeting portions of the gates may be effected. When the gates finally reach their closed position the crank-frame 25 will incline to one side of a vertical center line through the trunnions 39 and the links 26 will contact with and bear against a part of said frame as a stop and by their relation with said frame prevent the same from folding over unduly in its inclined position. The upper ends of the crank-frame and links by passing beyond a vertical center line through the trunnions 39, cause the locking of the gates in their closed position, and the gates may be further locked in closed position by the locking of the operating shaft 28 by means of the pawl 33 and dog 34.

In Figs. 10 and 11 I show a modified form of the crank-frame 25, this modification consisting mainly in substituting a central bar 50 for the three-sided frame shown in Figs. 5 and 6 and in allowing the links 26 to bear against recessed portions 51 of the trunnion-sections 41, when the gates are in closed position, instead of against the back of the frame in the manner shown in Fig. 2. In Fig. 10 the upper end of the bar 50 is shown as provided with studs 52 to receive the upper ends of the links 26, which, as shown, are substantially vertically disposed and straight.

My invention permits the safe and effectual operation and locking of the gates 22, the employment of a transverse operating shaft 28 at one side of the center of the car and away from said gates, the employment of very durable and simple crank and link mechanism disposed between the center sills of the car where they do not occupy valuable space, and the utilization of straight links 26. The crank-frame 25 is, preferably, one integral cast structure, and hence the parts for operating the gates are few and simple and so disposed as to afford the maximum convenience and efficiency.

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

1. A car having horizontally disposed hinged discharge gates, inclined floor sections leading thereto, and center-sills, combined with a crank-frame mounted above said gates and between said center-sills, substantially vertically disposed straight links pivotally secured at their upper ends directly to the upper end of said crank-frame and at their lower ends respectively to said gates, a sprocket wheel on said frame, a transverse operating shaft on one side of said gates and extending below one of said floor sections, a sprocket wheel on said shaft, and a chain connecting said sprocket wheels, said frame when the gates are closed being adapted to carry the upper ends of said links beyond the axial line of said frame, for locking said gates closed; substantially as set forth.

2. A car having horizontally disposed hinged discharge gates, inclined floor sections leading thereto, and center-sills, combined with a crank-frame mounted above said gates and between said center-sills, substantially vertically disposed straight links pivotally secured at their upper ends directly to the upper end of said crank-frame and at their lower ends respectively to said gates, a sprocket wheel on said frame, a transverse operating shaft at one side of said gates and extending below one of said floor sections, a sprocket wheel on said shaft, and a chain connecting said sprocket wheels, said frame when the gates are closed being adapted to carry the upper ends of said links beyond the axial line of said frame, for locking said gates closed, and said frame being an integral frame having trunnions at opposite sides of its lower end adapted to be secured by bearings to the lower edges of said center-sills; substantially as set forth.

3. A car having horizontally disposed hinged discharge gates, inclined floor sections leading thereto, and center-sills, combined with a crank-frame mounted above said gates and between said center-sills, substantially
 5 vertically disposed straight links pivotally secured at their upper ends directly to the upper end of said crank-frame and at their lower ends respectively to said gates, and means for operating said crank-frame to open and close said gates, said crank-frame when the
 10 gates are closed being adapted to carry the upper ends of said links beyond the axial line of said frame and said frame also affording bearing surfaces for said links when said gates are closed; substantially as set forth.

4. A car having horizontally disposed hinged discharge gates, inclined floor sections leading thereto, and center-sills, combined with a crank-frame mounted above
 15 said gates and between said center-sills, substantially vertically disposed straight links pivotally secured at their upper ends directly to the upper end of said crank-frame and at their lower ends respectively to
 20 said gates, and means for operating said crank-frame to open and close said gates, said crank-frame when the gates are closed being adapted to carry the upper ends of said straight links beyond the axial line of said frame,
 25 for locking said gates closed; substantially as set forth.

5. A car having horizontally disposed hinged discharge gates, inclined floor sections leading thereto, and center-sills, combined with an integral crank-frame com-

prising a back, sides and trunnions, substantially vertically disposed straight links located between said
 30 sides and pivotally secured at their upper ends directly to the upper end of said crank-frame and at their lower ends respectively to said gates, and means for operating
 35 said crank-frame to open and close said gates, said crank-frame when the gates are closed being adapted to carry the upper ends of said straight links beyond the axial line of said frame, for locking said gates closed; substantially as set forth.

6. A car having a discharge opening in its bottom and a pair of gates thereat hinged at their outer edges
 40 and adapted to overlap one upon the other at their inner edges when closed so as to leave no open space at said edges, combined with means for opening and closing
 45 said gates comprising a pivotally mounted crank, and links pivotally secured at their upper ends to said crank and at their lower ends respectively to said gates and adapted to cause one of said gates to slightly
 50 precede the other during the closing of the gates, for effecting the overlapping of the inner edges of the same; substantially as set forth.

Signed at New York city, in the county of New York and State of New York this 21st day of April A. D. 1906.

JOHN McE. AMES.

Witnesses:

THOMAS R. BROWN,
 CHAS. C. GILL.