

R. M. ZIMMERMAN.

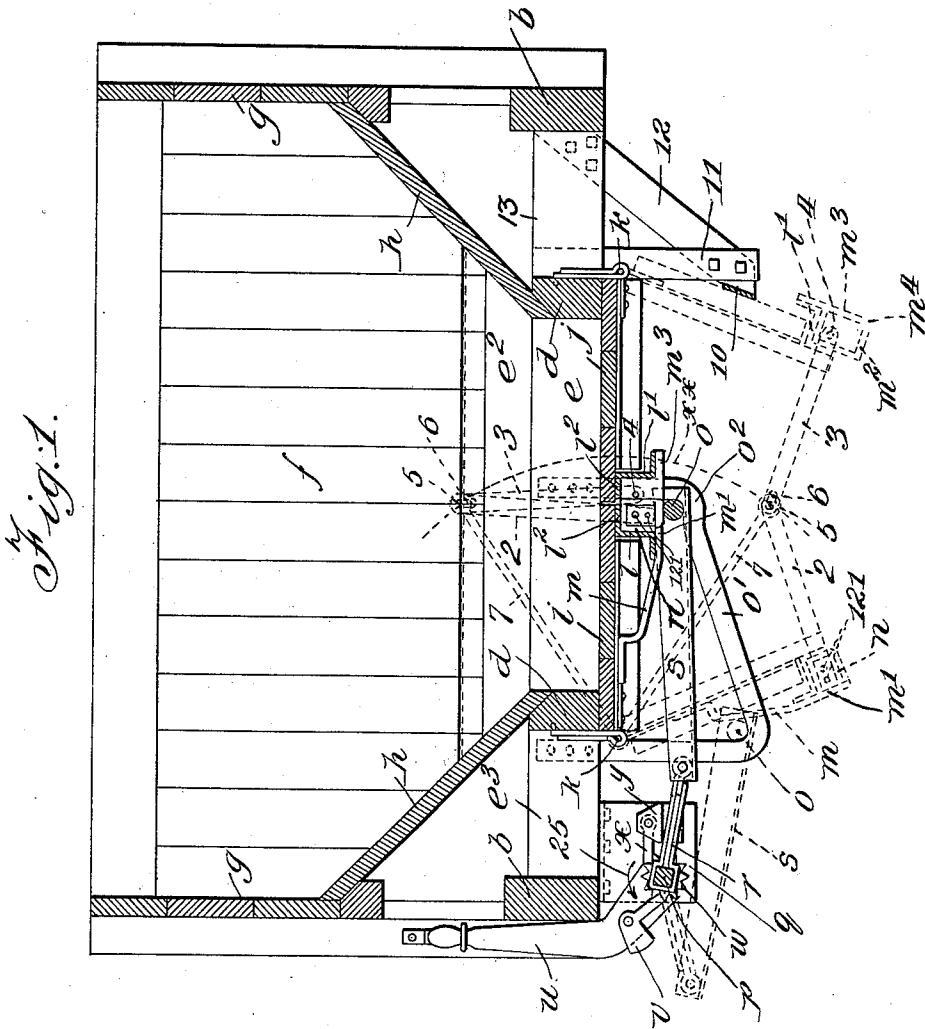
DUMP CAR.

APPLICATION FILED AUG. 15, 1910.

Patented Nov. 14, 1911.

3 SHEETS—SHEET 1.

1,008,443.



Witnesses
Alvin B. Batcher
John A. O'Keefe

Robert Montague Zimmerman
 Inventor
 By Attorney
Robert A. Brown

R. M. ZIMMERMAN.

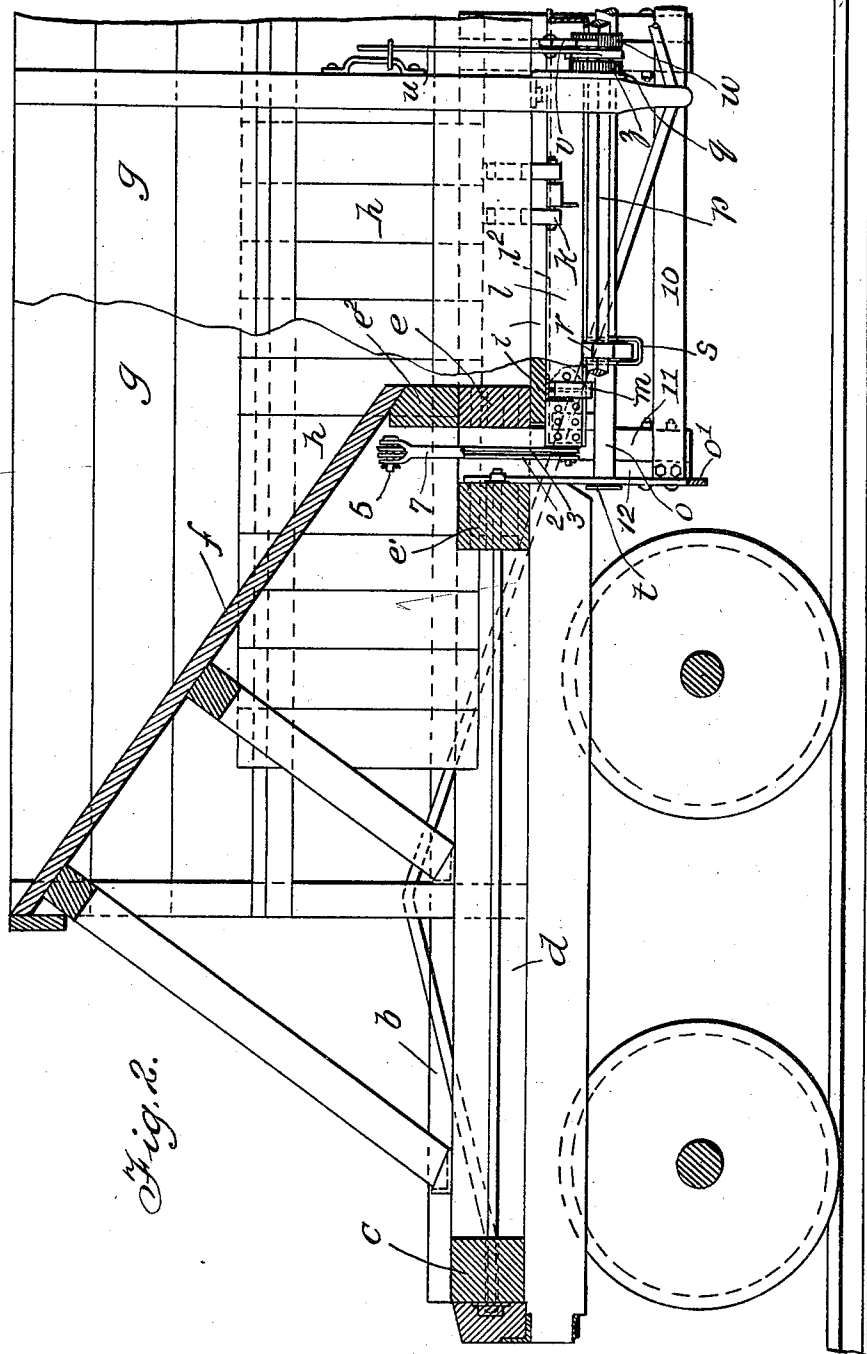
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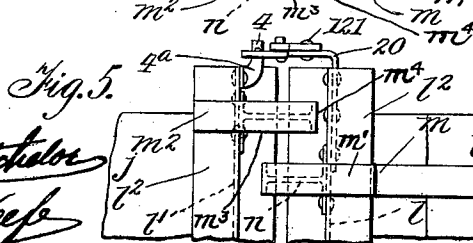
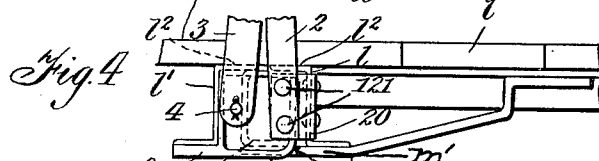
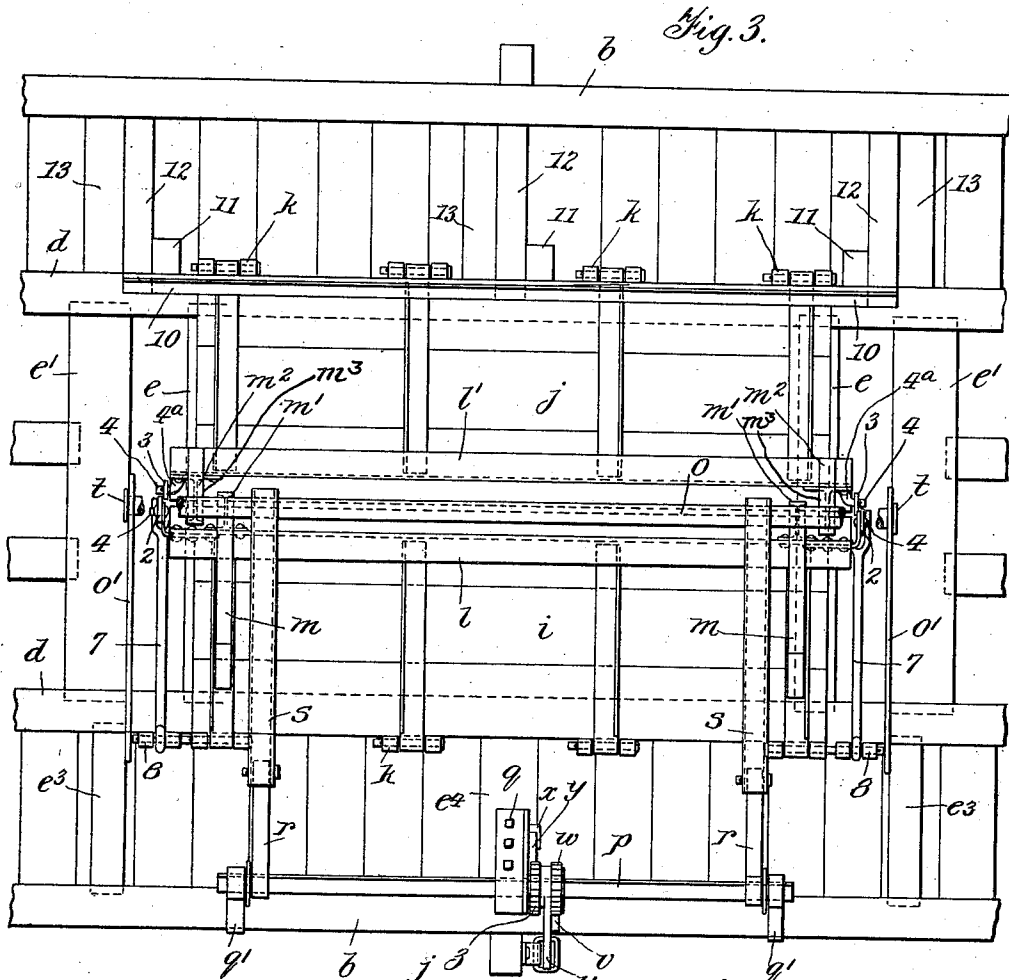
By Attorney
John W. Swan

R. M. ZIMMERMAN.
DUMP CAR.
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1,008,443.

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3 SHEETS—SHEET 3.



Witnesses
Albert Ketcher
John A. Ketcher

Robert Montague Zimmerman
Inventor
By Attorney
Oliver H. Mann

UNITED STATES PATENT OFFICE.

ROBERT MONTAGUE ZIMMERMAN, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO
NATIONAL DUMP CAR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF
MAINE.

DUMP-CAR.

1,008,443.

Specification of Letters Patent.

Patented Nov. 14, 1911.

Application filed August 15, 1910. Serial No. 577,197.

To all whom it may concern:

Be it known that I, ROBERT MONTAGUE ZIMMERMAN, of the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Dump-Cars; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates particularly to dump cars of the type having fixed bodies presenting a single hopper-like discharge opening and gravity discharge doors hinged to the side edges of the said opening, and the invention may be said to consist of the construction, combination, and particular arrangement of parts hereinafter described and pointed out in the claims.

For full comprehension, however of my invention reference must be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate the same parts and wherein—

Figure 1 is a transverse vertical section view of a car constructed according to my invention; Fig. 2 is a longitudinal section of one end of the car, parts thereof being shown in elevation; Fig. 3 is a bottom plan view of the middle portion of the car; Fig. 4 is a detail of the free sides of the doors with the latter in closed position; and Fig. 5 is a bottom plan view thereof.

In the car illustrated the body comprises a floor frame consisting of a pair of side sills *b* and end sills *c*, longitudinal intermediate sills *d*, and auxiliary sills *e*, *e'* situated transversely between the sills *d* and a pair of transverse railing pieces or fillers *e²* resting one on each of the sills *e*; and the superstructure carried by this floor frame comprises incline end hopper walls *f* and side walls consisting of vertical and inclined portions *g* and *h* respectively, the longitudinal intermediate sills *d* and transverse fillers *e²* having the hopper walls fastened thereto and forming the frame of the discharge opening of the car. The doors *i* and *j* are hinged as at *k* to the sills *d* forming the opposite sides of the discharge opening and are reinforced at their free sides by Z-bars *l* and *l'* having the flanges *l²* thereof, by which they are secured to the doors, extending toward such free sides, thus providing a space between the free edges of the doors and the webs of the Z-bars, such spaces ac-

commodating parts of the door locking mechanism to be presently described. The door *i* is provided on its underside near each end with a transverse rail *m* inclining downwardly therefrom toward the free side thereof and terminating in a portion *m'* substantially parallel to the door, such portion being secured to and supported by the Z-bars *l* and extending beyond the same to a point about in vertical line with the edge of the door, and being braced by a casting *n* located therebetween and the flanges *l²* of the Z-bars.

Secured to the Z-bars *l'* of the doors *j* are a pair of castings *m²* extending beyond the edge of the door *j*. The lower sides of these castings *m²* are slightly below the level of the portions *m'* of the rails when the doors are in their closed position, and constitute bearing faces *m³* corresponding in position, when the doors are closed, to such portions *m'*, these castings having their lower outer corners *m⁴* rounded off to form cams adapted to be engaged by the door operating shaft to be presently described.

The door operating mechanism comprises a laterally movable shaft *o* supported on rails *o'* situated at opposite ends of the door frame and secured to the transverse sills *e'* and spacers *e³* extending between the side sill *b* and intermediate sill *d*, such rails being upwardly inclined from the hinged side of such door toward the center of the car and terminating at a point below the level of the bearing face *m³* (when the doors are in closed position) the end portions *o²* of the rails being bent at an angle to the main portions thereof to present a diminished angle of convergence therebetween and the bearing faces *m³* of the casting *m²*.

The door *j* when in its open position is stalled by an abutment 10 carried by diagonal arms 12 secured to the floor frame of the car and braced against the weight of the door by braces 11 which are secured to spacers 13 (corresponding with the spacers *e³* at the opposite side of the car).

The shaft *o* is caused to travel sidewise up and down the supporting rails *o'* by an oscillatory shaft *p* situated below the level of the doors when closed and supported in bearing brackets *q* and *q'*, the bracket *q* being secured to a filler *e⁴* between the side and intermediate sills *b* and *d* respectively, the brackets *q'* being secured to the side sill.

The shaft p is connected to the shaft o by a pair of crank arms r rigidly secured thereto near the ends thereof and pivotally connected to the ends of pitmen s of channel cross-section the opposite ends whereof are connected to the shaft o . The shaft o is secured against lateral movement by heads t formed on the ends thereof and engaging the rails o .

The oscillatory shaft p is operated by a lever u fulcrumed thereto and carrying a weighted pawl v which engages a ratchet wheel w rigid upon the shaft while a detent pawl x supported by a bracket y secured to the bearing bracket q engages a second ratchet wheel z also rigid on the shaft to lock the latter against reverse rotation.

The means for transmitting a lifting force from the door moved by the shaft to the other door comprise links 2, 2, and 3, 3, located beyond the opposite ends of the doors, the links 2 being fixed by a pair of bolts or rivets 121 at their lower ends to angular bracket 20 (Figs. 4 and 5) fastened to the web of the Z-bar l on door i , the rigid connection of the links 2 to the door i causing the movement exerted by shaft o , upon such door to be converted into a lifting force exerted by the upper ends of the links 2. The links 3 are pivoted at their lower ends to pins 4 having widened ends 4^a fastened to the web of Z-bar l' on door j ; the upper ends of the corresponding links 2 and 3 being pivoted together by pins 5 thus completing the operative connection between the links 2 and doors j , such pins passing through slots 6 in the links 3 and being carried by links 2. In order to relieve the links 2 of undue strain a pair of tension links 7 are connected at one end to the pins 5, and at their other ends to brackets 8 fastened to the sills d at points beyond the ends of the discharge opening, these links acting to brace the upper ends of the links 2 during the operating of the doors.

Operation: When the doors are open, as shown in dotted lines in Fig. 1, and it is desired to close them the lever u is operated to rotate shaft p and crank arm r in the direction shown by the arrow 25, thus moving the shaft o sidewise, by means of the pitmen s , up the inclined rails o' , and causing it to bear against the rails m and raise door i . As the door i is raised the links 2 are forced ahead of it and owing to the lower ends of these links being rigidly secured to the brackets 20 their upper ends are caused to follow the path indicated by the dotted line $x-x$, the links 3 causing the door j to move in unison with the door i and be also raised. As the doors approach their closed position the castings m^2 project underneath the door i , the shaft o as it travels under the rail portions m' engaging the cams m^4 and raising the castings m^2 into engagement with the

underside of door i and finally wedges between the faces m^3 and the rail portions o^2 , thus holding both doors firmly in closed position, the slots 6 permitting movement of the door j under the direct bearing action of the shaft and independently of the link 2 on door i , such slots also relieving the links of the load upon the doors when closed. To open the doors the shaft p is operated in the opposite direction to cause the shaft o to move down the inclined rails o' thus allowing the doors to fall to full open position.

What I claim is as follows:—

1. In a dump car, the combination with a pair of doors and operating mechanism therefor including a laterally movable part, of a member carried by each door and projecting under the other door when the doors are in closed position, and means whereby such members are caused to be engaged by the laterally movable part, for the purpose set forth.

2. In a dump car, in combination, a pair of doors, means for causing such doors to move in unison, a laterally movable part, means for supporting such laterally movable part, a rail carried by one of the doors and adapted to be engaged by the laterally movable part, a member carried by the other door and adapted to engage the first mentioned door, and means for operating the laterally movable part to move it along the said rail and into engagement with the said member, for the purpose set forth.

3. In a dump car, in combination, a pair of doors, means for causing such doors to move in unison, a laterally movable shaft, a rail carried by one of the doors and adapted to be engaged by the laterally movable shaft, a member carried by the other door and adapted to engage the first mentioned door, such member being formed with a bearing face substantially parallel with the door, a rail supporting the laterally movable shaft and having its main length converging toward the said bearing face and having a portion inclined to the main length to present a diminished angle of convergence toward the bearing face, and means for operating the laterally movable shaft to move it into position between the bearing face and the last mentioned portion of the rail, for the purpose set forth.

4. In a dump car, in combination, a pair of doors, a laterally movable member supporting one of the doors and adapted when operated to move across the underside thereof to operate such door, a link rigidly secured at one end to one of the doors, a second link pivotally connected at one end to the first mentioned link and at its opposite end to the other door, and means for operating the laterally movable member.

5. In a dump car, the combination with a pair of doors, of door operating mechanism

located beneath the level of the doors when closed and comprising a laterally movable shaft for operating one of the doors, means effecting a connection between such door
 5 and the other door whereby the latter is raised by the first mentioned door such last mentioned means including a sliding connection.

6. In a dump car, the combination with
 10 the frame of the car and a pair of doors, of door operating mechanism located beneath the level of the doors when closed and comprising a laterally movable shaft for operating one of the doors, a pair of pivoted
 15 links uniting the doors, and means connecting the said pivoted links to the frame of the car.

7. In a dump car, the combination with a pair of doors hinged to the opposite sides of the car one of such doors having secured to the underside thereof inclined rails presenting portions substantially parallel to the door, of a pair of inclined supporting rails situated adjacent to the opposite ends of
 25 such door and presenting portions having an acute angle of inclination relatively to the door when in closed position, castings secured to the other door and adapted to project beneath the first mentioned door
 30 when such doors are closed; links operatively connecting the doors together, a laterally movable shaft on the supporting rails, and means for moving such shaft to cause it to act first on the rails secured to
 35 the door and secondly upon the castings secured to the other door, substantially as and for the purpose set forth.

8. In a dump car, the combination with a pair of doors hinged to the opposite sides

of the car, one of such doors having secured
 40 to the underside thereof inclined rails presenting portions substantially parallel to the door, of a pair of inclined supporting rails situated adjacent to the opposite ends
 45 of such door and presenting portions having an acute angle of inclination relatively to the door when in closed position, castings secured to the other door and adapted to project beneath the first mentioned door
 50 when such doors are closed, a pair of links rigidly secured at one end to the first mentioned door, a second pair of links pivotally connected at one end to the first mentioned links and at their opposite ends to the other door, a pair of bracing links connecting the
 55 first mentioned links to the car frame, a laterally movable shaft on the supporting rails, and means for moving such shaft to cause it to act first on the rails secured to the door and secondly upon the castings secured
 60 to the other door, substantially as and for the purpose set forth.

9. In a dump car, the combination with a pair of doors, of a laterally movable door operating and supporting shaft located beneath one of the said doors, the other door
 65 having a projection extending under the first mentioned door and adapted to be engaged by the said shaft to hold the second mentioned door closed.
 70

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

ROBERT MONTAGUE ZIMMERMAN.

Witnesses:

WILLIAM P. McFEAT,
 JOHN A. O'KEEFE.