

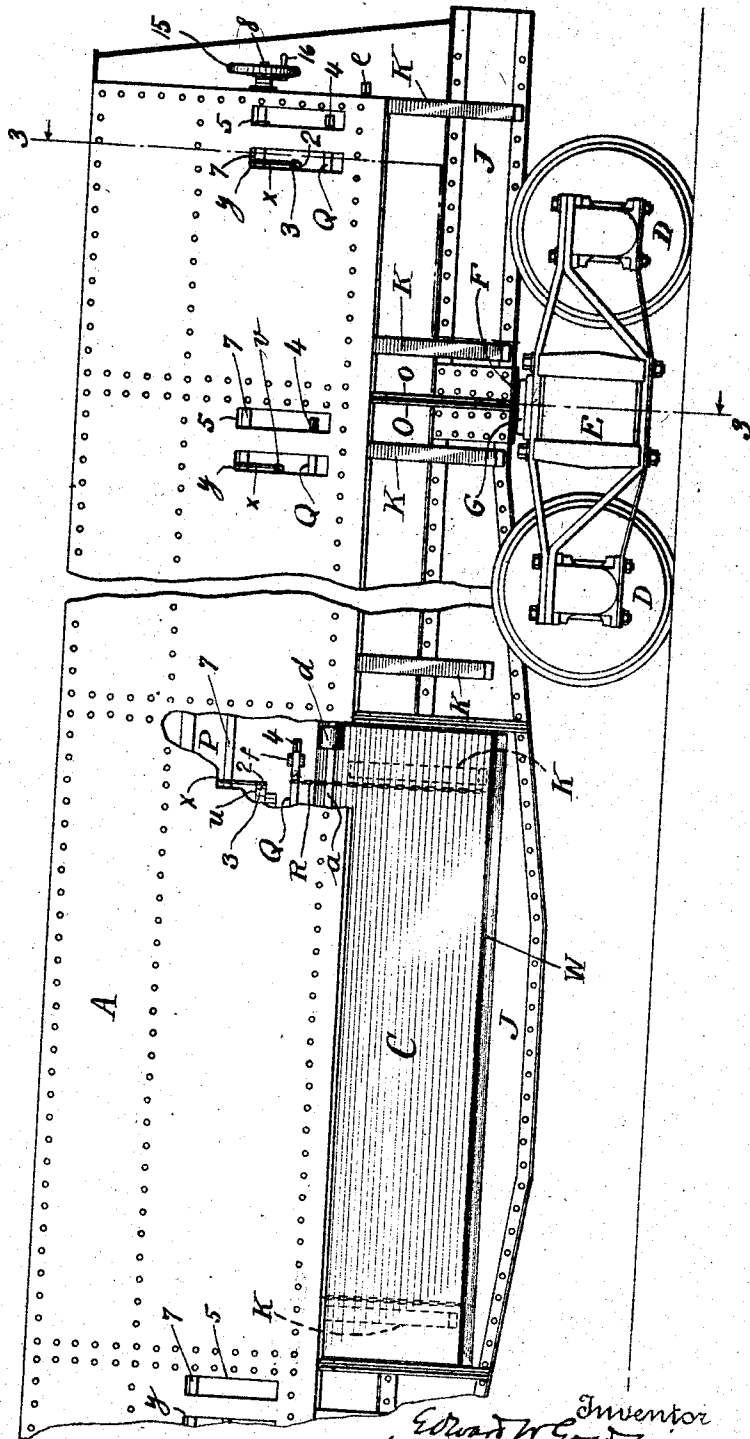
1,027,197

E. W. GOODWIN.
DROP DOOR OPERATING MECHANISM FOR DUMPING CARS.
APPLICATION FILED JUNE 23, 1910.

Patented May 21, 1912.

3 SHEETS-SHEET 1.

Fig. 1



Witnesses:
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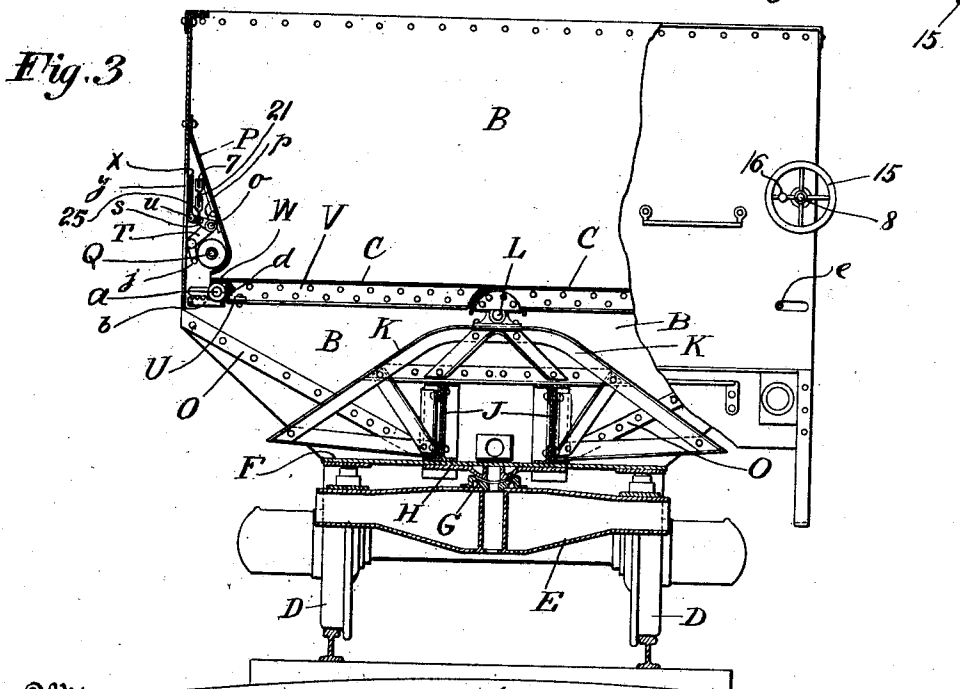
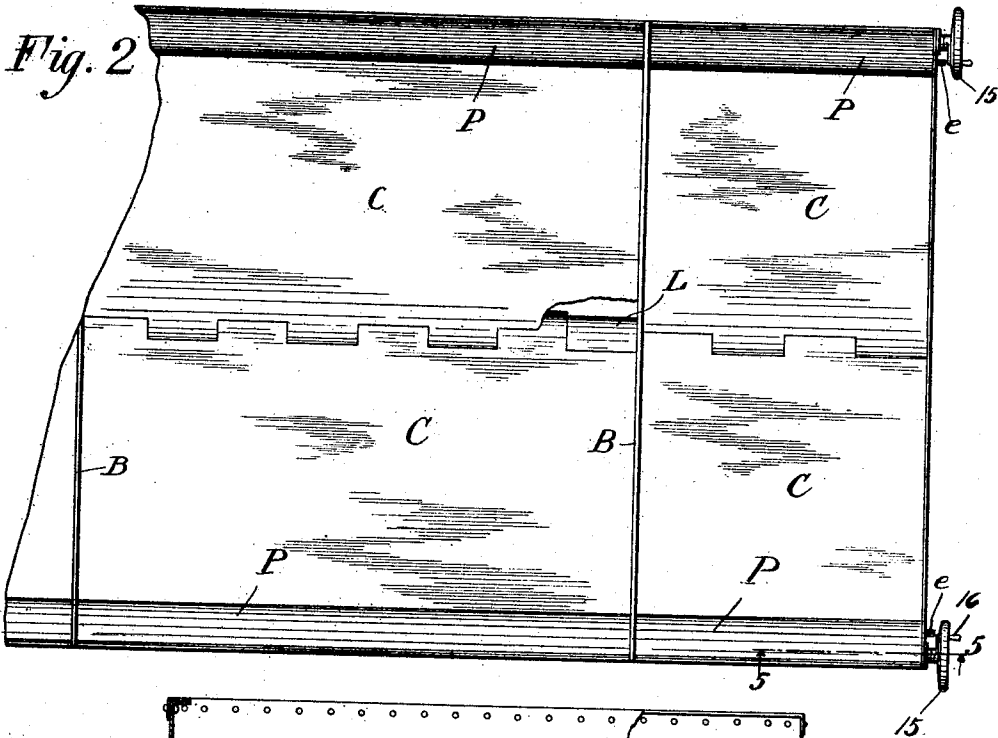
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3 SHEETS—SHEET 2.



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3 SHEETS-SHEET 3.

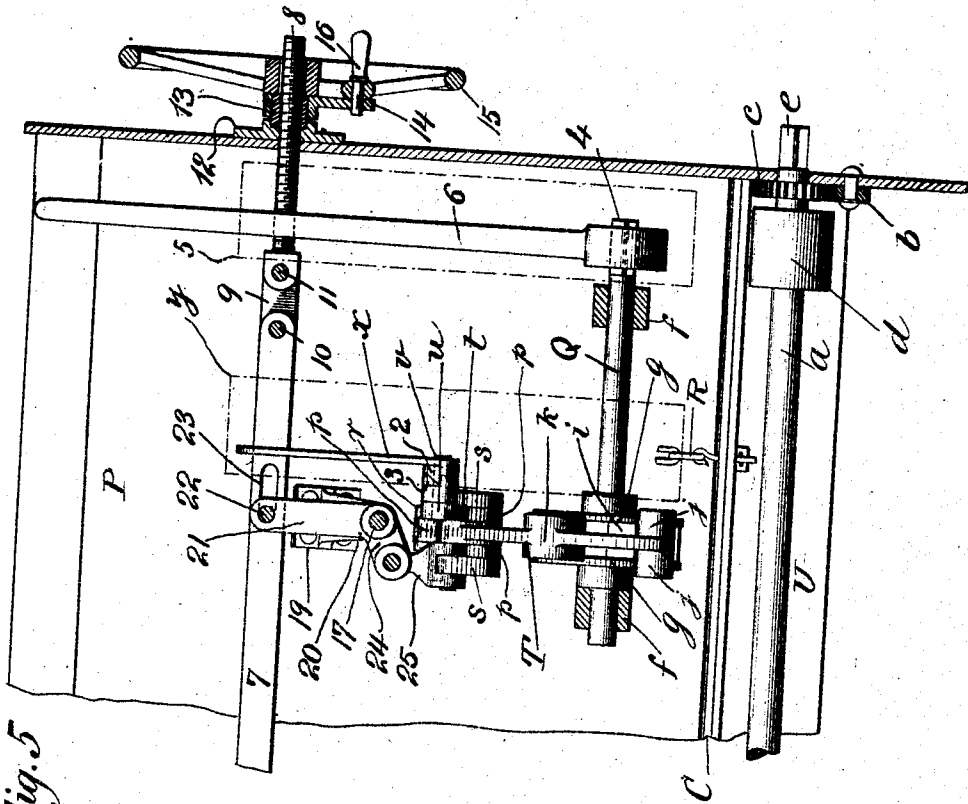


Fig. 5

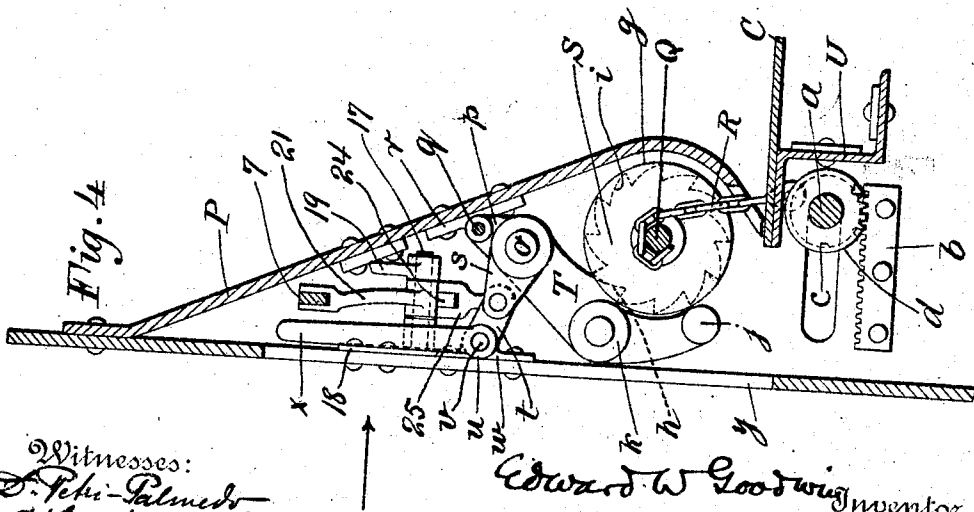


Fig. 4

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UNITED STATES PATENT OFFICE.

EDWARD W. GOODWIN, OF NEW YORK, N. Y., ASSIGNOR TO GOODWIN CAR COMPANY,
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DROP-DOOR-OPERATING MECHANISM FOR DUMPING-CARS.

1,027,197.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed June 23, 1910. Serial No. 568,429.

To all whom it may concern:

Be it known that I, EDWARD W. GOODWIN, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Drop-Door-Operating Mechanism for Dumping-Cars, of which the following is a specification, accompanied by drawings.

10 This invention relates to mechanism for operating the valves or drop doors of railway dumping cars or other dumping vehicles, and one of the objects of the invention is to enable the compartments of a car to be discharged either separately or simultaneously by means which insure the safety of the operators at all times and are easily and quickly manipulated with the least amount of effort.

20 Another object of the invention is to enable the drop doors for each compartment to be separately returned to closed position, without interference from the mechanism for simultaneously opening the doors.

25 Further objects of the invention will hereinafter appear, and to these ends the invention consists of apparatus for carrying out all of the above objects, embodying the features of construction, combinations of elements, and arrangement of parts having the general mode of operation substantially as hereinafter fully described and claimed in this specification and shown in the accompanying drawings, in which—

35 Figure 1 is a side elevation, partly broken away, of a railway dumping car embodying the invention; Fig. 2 is a top plan view of one end of the car partly broken away; Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1; Fig. 4 is an enlarged detail view partly in transverse section of the mechanism for operating the drop doors as shown at the left of Fig. 3; and Fig. 5 is a side elevation of Fig. 4, looking in the direction of the arrow, and partly in longitudinal section, showing the end of the car on the line 5—5 of Fig. 2.

Referring to the drawings, A represents the body of a railway dumping car having 50 compartments formed by the transverse bulk heads B, and each compartment is provided with the centrally hinged drop doors

C. The car trucks may be of any suitable construction comprising the wheels D and connecting parts supporting the truck bolsters E upon which are supported the body 55 bolsters F by means of the socket bearings G, and bearing plates H secured to the body bolsters. The center sill J may be formed of I-beams supported upon the body bolsters F and extending throughout the length of the car, upon which are carried the built up 60 needle beams K forming yokes for supporting the drop doors C when opened. The drop doors C are pivoted at L to the needle beams by any suitable form of non-leaking 65 hinge. The transverse bulk heads B over the trucks preferably extend downwardly below the drop doors C to the ends of the body bolsters F and are suitably secured to 70 the center sills and braced as by means of the braces O. The intermediate and end bulk heads B preferably extend to the bottom of the center sill J.

In a hopper bottom railway dumping car 75 of the type shown, for illustrating the invention, the sides of the compartments are provided with aprons P extending downwardly and inwardly to protect the mechanism for operating the drop doors C. The 80 operating mechanism is located within the spaces between the sides of the car and the aprons and comprises in this instance suitable ratchet detent mechanisms for operating the chain shafts Q upon which are 85 wound and unwound the chains R connecting to the outer ends of the drop doors C. The ratchet detent mechanisms are preferably controlled by power multiplying devices which release the ratchet wheel S and 90 hold the detent arms T to permit the drop doors to open under load, without interference from the detents, thus preventing the detents from accidentally engaging the ratchet wheels while the compartment is discharging and thereby insuring the safety of 95 the operators at all times. The power multiplying devices for controlling the ratchet detent mechanisms are preferably in the form of toggle acting levers, although any 100 suitable form of power multiplying devices may be used. Means are provided for separately operating the pairs of doors C of each compartment of the car and suitable

mechanism is connected with said discharging means for simultaneously discharging the compartments. Means are also provided for returning the doors of each compartment separately to closed position without interference from the mechanism for simultaneously opening the doors.

The drop doors C may be of any suitable construction, and are shown provided at the ends with the Z bars U connecting the sides V of the doors and forming lips W, under which creeping shafts *a* may be moved to lock the doors in closed position. These creeping shafts *a* preferably travel upon the stationary racks *b* by means of the toothed rollers *c* and the shafts *a* are provided with the enlarged portions *d* upon which the lips W of the drop doors C rest in closed position. The ends *e* of the shafts *a* extending beyond the end of the car are squared to receive a suitable crank or hand tool for operating purposes.

The chain shafts Q are supported in suitable bearings *f* which may be secured to the inner sides of the car body and the ratchet wheels S are provided with shroud flanges *g* lying at each side of the ratchet T. The detent bars T are provided with the detents *h* cooperating with the teeth *i* and these bars are preferably curved and provided with lugs *j* adapted to bear upon the shroud flanges *g* of the ratchets. The bars T may also be weighted at *k*. The detent bar T is pivoted at *o* to the short link *p* which is in turn pivoted at *q* to the bracket *r* suitably secured to the apron P. The normal position of the pivot *o*, when the ratchet is in locked position is somewhat inboard of the axis of the studs *j* so that the detent tooth *h* is urged by gravity into engagement with the ratchet wheel S. Furthermore, the knuckle of the toggle formed by the arm T and link *p* is normally slightly beyond the dead center line, so that the tendency of the parts is to be maintained in locked position under pressure from the ratchet wheel S under load.

Pivoted at *o* is the link *s*, the outer end of which is pivotally connected to the lever arm *t* extending inwardly from the hub *u* pivoted at *v* on the bracket *w* secured to the side of the car body. This hub *u* is provided with the removable operating handle *x* which may be operated by reaching through the opening *y* at the side of the car. The operating handle *x* is shown in this instance provided with a clutch member 2 adapted to cooperate with the clutch member 3 on the hub *u*. By pulling the lever *x* downwardly and outwardly the pivotal connection between the lever arm *t* and link *s* is raised, thereby breaking the toggle and moving the pivotal connection between the detent arm T and the link *p* upwardly, thus lifting the detent tooth *h* out of engagement

with the teeth of the ratchet S and permitting the drop doors to open under gravity. The lugs *j* at the lower end of the detent arm T travel on the shroud flanges *g* and the detent tooth *h* is quickly disengaged from the teeth of the ratchet wheel and maintained out of engagement as long as desired without danger of "kicking back". The ends 4 of the chain shafts Q as shown extend opposite the openings 5 in the sides of the car and are adapted to receive a ratchet wrench 6 for rewinding the chains and closing the drop doors C.

The mechanism for simultaneously opening the doors of the different compartments of the car is connected to the power multiplying devices controlling the ratchet detent mechanisms and in operating the doors simultaneously, the hand levers *x* should be preferably disconnected from the power multiplying devices at the clutch members 2 and 3, so that these handles will not be projected outwardly beyond the car body. As shown in this instance, bars or rods 7 extend longitudinally of the car adjacent the operating devices for the drop doors beneath the aprons P. Screw threaded ends 8 projecting beyond the end of the car are connected to the rods 7 by means of short links 9 pivoted at 10 to the rods 7 and pivoted at 11 to the screw threaded ends 8, so that slight vertical play of the rods 7 is afforded. The screw threaded ends 8 extend through the bearings 12 and are provided with the nuts 13 having arms 14, and each screw threaded end 8 is provided with a hand wheel 15 or other hand device loose upon the shaft and adapted to be connected to the arm 14, as by means of the pin 16. By turning the wheel 15 and nut 13 the rods 7 will be moved longitudinally of the car. Pivoted on shafts 17 supported by brackets 18 and 19 are bell crank levers 20, the longer arms 21 of which are provided with pins 22 engaging longitudinal slots 23 in the rods 7. The shorter arms 24 of the bell crank levers 20 are pivotally connected by links 25 to the links *s* of the power multiplying devices. In normal position the pins 22 lie at the inner ends of the slots 23 in the bars 7, so that by moving said bars longitudinally in a direction to rock the bell crank levers 20, the pivotal connection between the links *s* and *t* will be raised and the detent teeth *h* of the detent bars T simultaneously withdrawn from the ratchet wheels S. By this means all of the pairs of drop doors C may be simultaneously operated.

In rewinding the chains upon the chain shafts Q the detent teeth *h* travel over the teeth of the ratchet wheels and movement of the toggle acting devices is permitted by reason of the lost motion connection between the bell crank levers 20 and the longitudinal bars 7. Interference with the oper-

ation of rewinding is further avoided by the slight upward play permissible of the bars 7 at the short links 9.

I claim and desire to obtain by Letters Patent the following:

1. In a dumping car, the combination with the car body, of a series of pairs of drop doors, means for separately operating said pairs of doors and independently actuated mechanism connected with said operating means for simultaneously operating said doors.

2. In a dumping car having compartments, the combination of means for separately discharging said compartments, and independently actuated mechanism connected with said discharging means for simultaneously discharging said compartments.

3. In a dumping car, the combination with the car body having compartments and drop doors therefor, of means for separately discharging said compartments, independently actuated mechanism connected with said discharging means for simultaneously discharging said compartments, and means for separately returning the doors of each compartment to closed position.

4. In a dumping car, the combination with the car body having compartments and drop doors therefor, of means for simultaneously discharging said compartments, and means for separately returning the doors of each compartment to closed position, without interference from the means for simultaneously discharging the compartments.

5. In a dumping car, the combination with the car body, of a series of pairs of drop doors, ratchet detent mechanisms for operating said doors, power multiplying devices controlling said ratchet detent mechanisms, means for separately actuating said power multiplying devices to open the pairs of doors, and means for actuating said devices simultaneously to open the doors.

6. In a dumping car, the combination with the car body, of a series of pairs of drop doors, ratchet detent mechanisms for operating said doors, power multiplying devices controlling said ratchet detent mechanisms, means for separately actuating said power multiplying devices to open the pairs of doors, means for actuating said devices simultaneously to open the doors, and means for separately closing said pairs of doors.

7. In a dumping car, the combination with the car body, of a series of pairs of drop doors, ratchet detent mechanisms for operating said doors, toggle acting devices controlling said ratchet detent mechanisms, means for separately actuating said toggle acting devices to open the pairs of doors, and means for actuating said devices simultaneously to open the doors.

8. In a dumping car, the combination with the car body having compartments and drop doors therefor, of ratchet detent mechanisms for operating said doors, power multiplying devices for releasing and holding the detents to permit the doors to open without interference from the detents, means for separately actuating said power multiplying devices, and means connected with said multiplying devices for simultaneously actuating said devices.

9. In a dumping car, the combination with the car body, of a series of pairs of drop doors, means for separately operating said pairs of doors, separate mechanism connected with said operating means for simultaneously operating said doors and additional means for locking all of said doors closed.

10. In a dumping car, the combination with the car body, of a series of pairs of drop doors, ratchet detent mechanisms for operating said doors, power multiplying devices for controlling said mechanisms, levers for separately actuating said multiplying devices, longitudinally movable bars extending throughout the length of the car body, intermediate levers connected to said multiplying devices and having lost motion connections with said bars, and means for operating said bars to simultaneously actuate said multiplying devices.

11. In a dumping car, the combination with the car body, of a series of pairs of drop doors, ratchet detent mechanisms for operating said doors, power multiplying devices for controlling said mechanisms, levers for separately actuating said multiplying devices, means for disconnecting said levers from the multiplying devices, longitudinally movable bars extending throughout the length of the car body, intermediate levers connected to said multiplying devices and having lost motion connections with said bars, and means for operating said bars to simultaneously actuate said multiplying devices.

12. In a dumping car, the combination with the car body, of a series of pairs of drop doors, ratchet detent mechanisms for operating said doors, power multiplying devices for controlling said mechanisms, levers for separately actuating said multiplying devices, means for disconnecting said levers from the multiplying devices, longitudinally movable bars extending throughout the length of the car body, intermediate levers connected to said multiplying devices, and having lost motion connections with said bars, means for operating said bars to simultaneously actuate said multiplying devices, and means for separately closing said doors.

13. In a dumping car, the combination with the car body, of a series of pairs of

drop doors, ratchet detent mechanisms for operating said doors, toggle acting devices for controlling said mechanisms, levers for separately actuating said toggle acting devices, longitudinally movable bars extending throughout the length of the car body, intermediate levers connected to said toggle acting devices and having lost motion connections with said bars, and means for operating said bars to simultaneously actuate said toggle acting devices.

14. In a dumping car, the combination with the car body, of a series of pairs of drop doors; ratchet detent mechanisms for operating said doors, toggle acting devices for controlling said mechanisms, levers for separately actuating said toggle acting devices, means for disconnecting said levers from the toggle acting devices, longitudinally movable bars extending throughout the length of the car body, intermediate

levers connected to said toggle acting devices, and having lost motion connections with said bars, means for operating said bars to simultaneously actuate said toggle acting devices, and means for separately closing said doors.

15. In a dump car, drop doors pivotally mounted on the car body, a ratchet detent mechanism for operating the doors and means for locking the detent mechanism and holding the doors in the closed position, the means being held in the locking position by the weight of the doors on the detent mechanism.

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

EDWARD W. GOODWIN.

Witnesses:

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H. G. KIMBALL.