

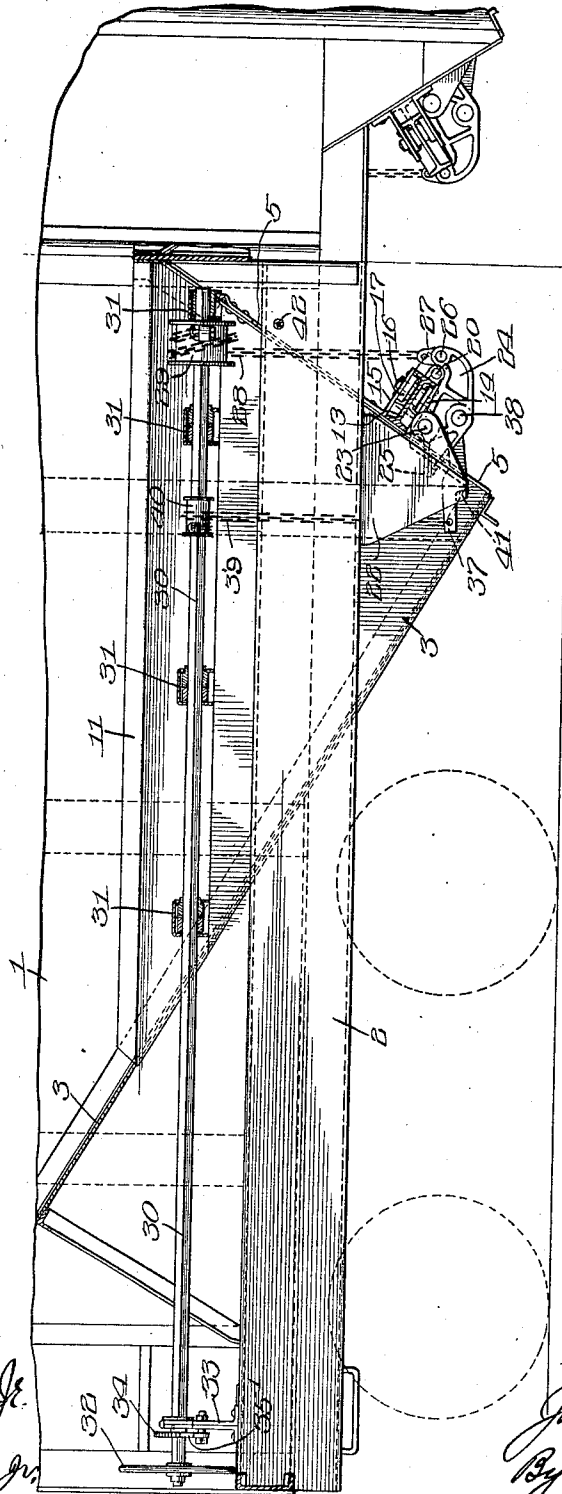
J. PEARSON.
DOOR MECHANISM FOR HOPPER CARS OR THE LIKE.
APPLICATION FILED DEC. 6, 1909.

1,030,204.

Patented June 18, 1912.

5 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
H. D. Donarusk Jr.
J. M. Nelson Jr.

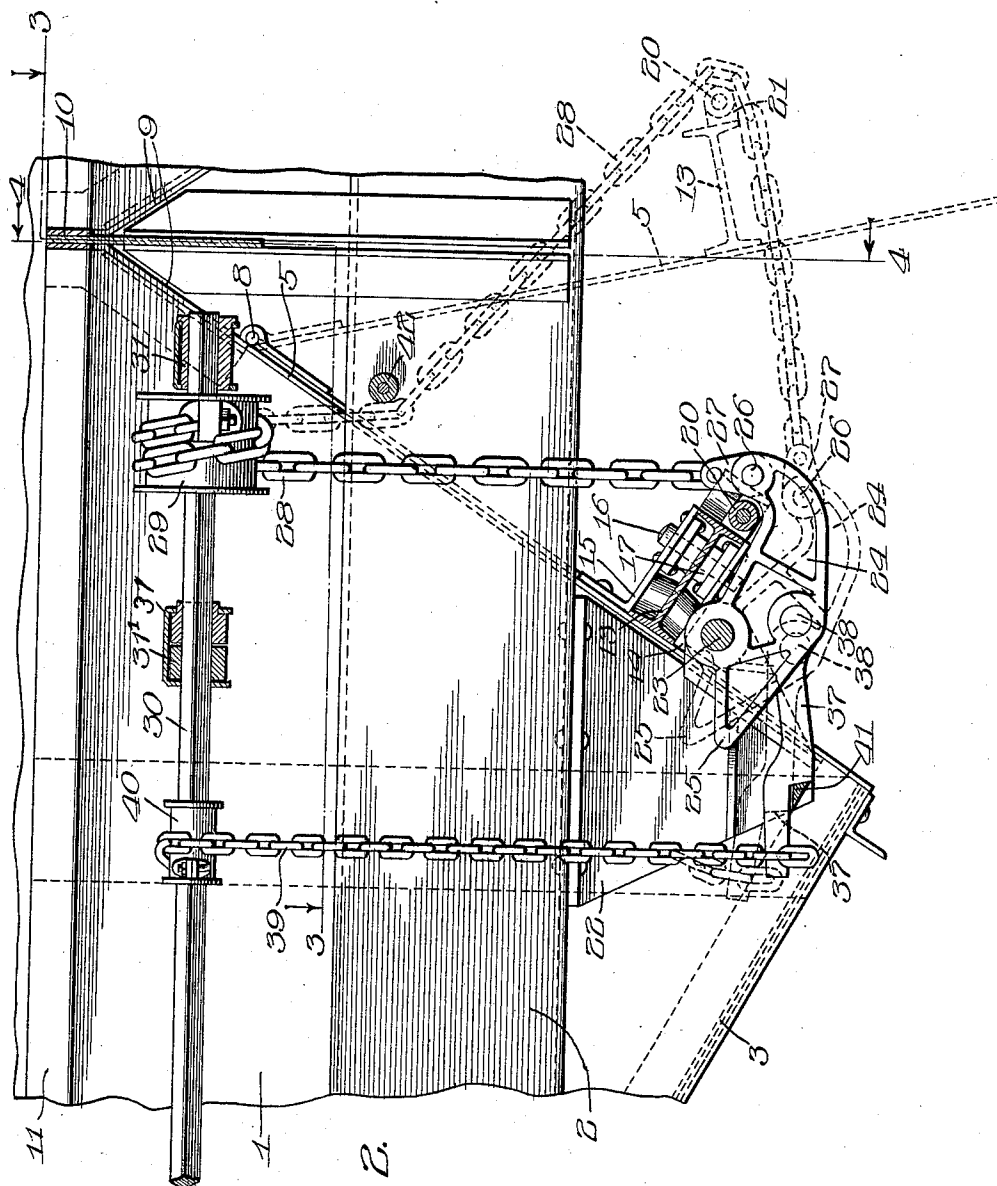
Inventor:
John Pearson
By Neil & Neil
attys

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5 SHEETS—SHEET 2.



Witnesses:
G. W. Donarusk Jr.
Geo. H. Nelson Jr.

NO. 2.

Inventor:
John Pearson
By Will & Hill
Attys

J. PEARSON.

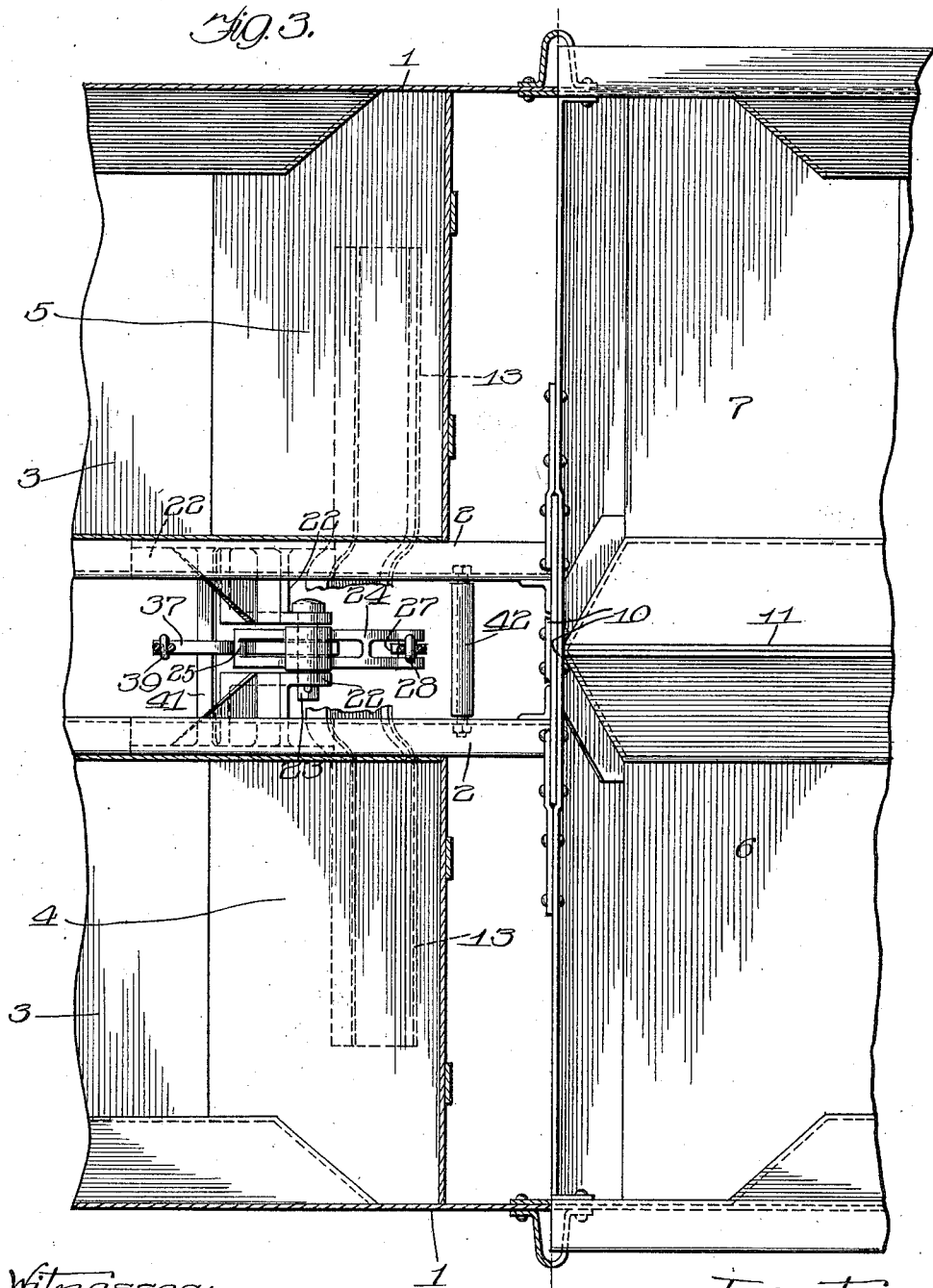
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5 SHEETS—SHEET 3.



Witnesses:
G. W. Donarusk Jr.
Geo. H. Nelson Jr.

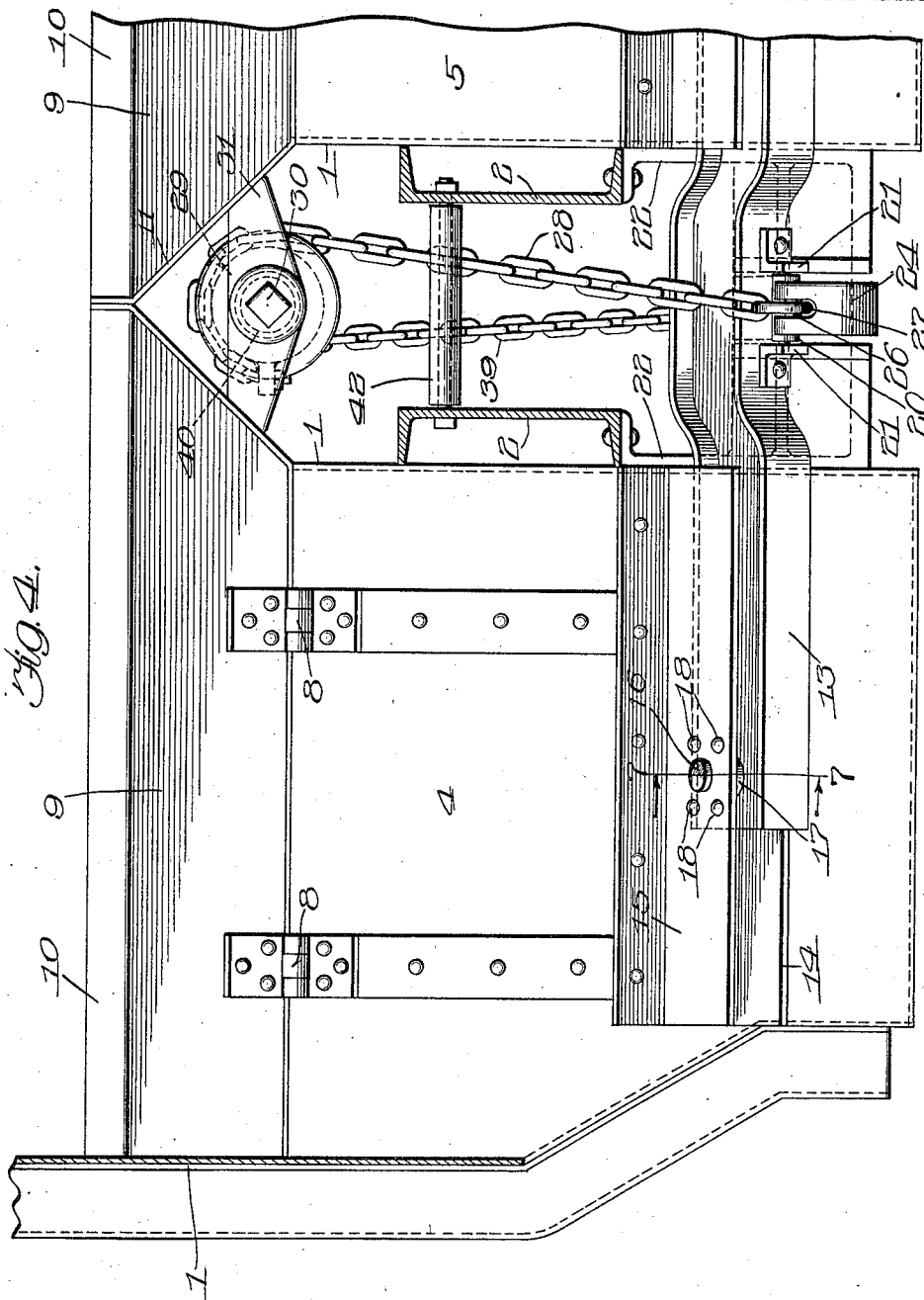
Inventor:
John Pearson
By Hill & Hill
Attys

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5 SHEETS—SHEET 4.



Witnesses:
 G. O. Donarus Jr.
 Geo. H. Nelson Jr.

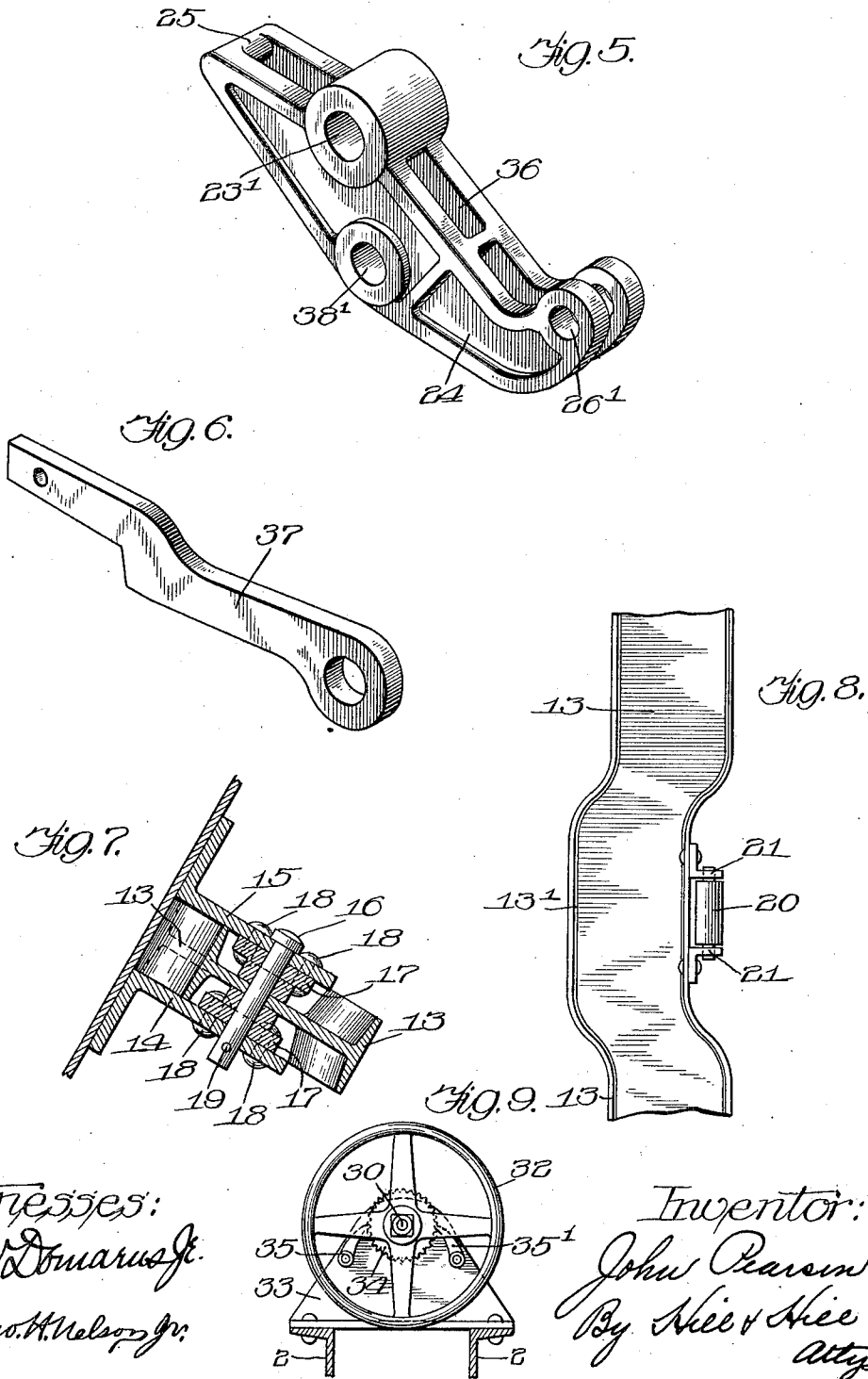
Inventor:
 John Pearson
 By Will White
 atty

J. PEARSON.
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5 SHEETS—SHEET 5.



Witnesses:
G. W. Donarusk Jr.
Geo. H. Nelson Jr.

Inventor:
John Pearson
By Nee & Nee
Atty

UNITED STATES PATENT OFFICE.

JOHN PEARSON, OF CHICAGO, ILLINOIS.

DOOR MECHANISM FOR HOPPER-CARS OR THE LIKE.

1,030,204.

Specification of Letters Patent.

Patented June 18, 1912.

Application filed December 6, 1909. Serial No. 531,655.

To all whom it may concern:

Be it known that I, JOHN PEARSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Door Mechanism for Hopper-Cars or the Like, of which the following is a description.

My invention belongs to that class of devices known as car door mechanism and relates more particularly to a dump door mechanism for hopper cars or the like, and has among its objects the production of a simple, efficient and satisfactory device of the kind described, positive in action, that may be used wherever found applicable.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings wherein like reference characters indicate like or corresponding parts, Figure 1 is a partial longitudinal sectional view of a portion of a hopper car, Fig. 2 is an enlarged sectional view and side elevation of my preferred form of mechanism, Fig. 3 is a plan of the locking mechanism taken substantially on line 3—3 of Fig. 2, Fig. 4 is a cross sectional view of a portion of the car on the line 4—4 of Fig. 2 and view in elevation of the door operating mechanism, Fig. 5 is a perspective view of the locking member 24, Fig. 6 is a perspective view of the latch member 37, Fig. 7 is a sectional view taken substantially on line 7—7 of Fig. 4, Fig. 8 is a top elevation of a portion of the beam 13, and Fig. 9 is a view in elevation of the winding shaft controlling means.

Referring to the drawings in which my preferred form of device is shown as applied to a hopper car, the car is not shown complete or in all its details, as these form no part of my invention, it being understood that the mechanism may be used on any preferred car construction to which it may be found applicable. The car body 1 is supported upon suitable trucks, not shown, suitable beams 2, 2 being preferably provided extending centrally lengthwise the car. As shown, the ends of the car are preferably inwardly inclined proximate to the center of the car, forming the car bottom, and 4, 5, 6 and 7 represent a plurality of doors suitably pivotally supported from the car body

as at 8. As most clearly shown in Figs. 1 and 2, the doors are preferably arranged so that they will be inclined to meet the bottom 3 when the doors are closed. The construction shown preferably comprises a pair of doors for each inclined end 3, and parts of the car body are represented by the numerals 9, 10, 11 and 12, which parts may be modified as desired.

In the construction shown one pair of doors is controlled from one end and the other pair from the opposite end and the construction being similar, a description of the mechanism for controlling one pair of doors will suffice for both. The doors 4 and 5, as before mentioned, are pivotally supported from the car body, as at 8, and connected by means of a beam 13, suitable mechanism being provided for returning and locking the doors in their closed position after they have swung back to discharge the load, as indicated by the position of door 5 in the dotted lines in Fig. 2. Each pair of doors is preferably provided with a suitable controlling mechanism, arranged to close and lock the same in the desired position, and with auxiliary mechanism arranged to positively lock the controlling mechanism for the door in operative position as well as to positively force the same out of operative position when desired. In the preferred construction this auxiliary mechanism is controlled by the same controlling means that controls the mechanism for closing and locking the doors. The beam 13 may be secured to the doors 4 and 5 in any suitable manner, preferably by means of angle bars 14 and 15 or their equivalent, same being pivotally secured thereto by means of pins 16, suitable bearing blocks 17 being secured to the beams 14 and 15 by means of suitable bolts 18 or their equivalent so that there is some flexibility in the connection. As shown, the beam 13 is preferably offset as at 13¹ (see Fig. 8) and provided with a roll 20 carried by brackets 21 or their equivalents for the purpose, the roll 20 cooperating with a suitable holding member and flexible controlling means therefor, as hereafter described.

Secured to the beams 2, 2 is a casting 22 which pivotally carries the locking or holding member 24. Any equivalent for the casting 22 may be provided. As shown, the member 24 is pivotally supported by means of a pin 23. The preferred form of lock-

ing or holding member is shown in Fig. 5, 23¹ representing a hole through which the pin 23 passes. One end of the member 24 is preferably extended as at 25, as will be more fully explained in the operation of the device. A winding shaft 30 is provided, the same being suitably supported by bearings 31 or their equivalents for the purpose, the shaft being provided with bearing members 31¹. The shaft 30 is preferably provided with a drum 29 to which is secured a chain or flexible member 28, the opposite end of the chain being secured to the member 24 by means of a pin 26 and link 27 or their equivalents for the purpose. As is obvious, when the chain is slacked and the door in the position shown by the dotted lines in Fig. 2, straining the chain will draw the door shut and draw up the holding member so that the weight of the door is carried by the locking or holding member 24, pin 23 and casting 22 which is carried by the beams 2, 2. Any suitable means may be employed to operate the shaft 30, as shown in Figs. 1 and 9 a wheel 32 is provided together with a ratchet 34, and pawls 35—35' carried by the support 33. The member 24 also carries what may be termed a controlling or latch member 37 pivotally secured thereto by means of a pin 38, which passes through the hole 38¹ (see Fig. 5). The end of the member 37 is connected by means of a chain 39 or an equivalent flexible member to the shaft 30, as shown to a drum 40 arranged on the shaft, but the same is oppositely connected relative to the chain 28, that is, so that winding or straining chain 28 will unwind chain 39 or vice versa. The member 22 is provided with an extension or part 41 arranged to cooperate with the end of the member 37, as will be more clearly explained in describing the operation of the device. A roll 42 may also be provided if desired, the same being preferably carried by the beams 2, 2.

The operation of the device may be briefly described as follows: Assuming that the doors 4 and 5 are in position substantially as shown in Figs. 1 and 2, the chain 28 being under a strain and the chain 39 slacked as shown. In this case the weight of the doors is carried by the holding member 24 through the pin 23, casting 22 from the beams 2, 2. Should the chain 28 break the member 37 by engaging the part 41 of the casting will prevent the member 24 from dropping and thereby release the doors. To open the doors and dump the load the shaft 30 is rotated to unwind the chain 28 thereby at the same time straining the chain 39 and thus drawing up the member 37 and unlocking it from the part 41. If the member 24 does not drop down from gravity then the engagement of the member 37 with the same at 25 will positively raise the end

25, forcing down the opposite end so that the weight of the door and load will cause the same to swing open substantially as indicated by the dotted lines in Fig. 2. The contents of the car are then discharged. Reversing the rotation of the shaft 30 strains chain 28, drawing the doors 4 and 5 shut and raises the member 24 to operative holding position and permits the member 37 to drop down and positively lock member 24 in operative position. It will thus be seen that the locking and unlocking of the door is positive and controlled by the winding shaft 30, but one operation being necessary to control or operate the doors.

Having thus described my invention it is obvious that various immaterial modifications may be made in the form, construction, arrangement and combination of parts herein shown and described, hence I do not wish to be understood as limiting myself to the exact form, construction or combination of parts shown or described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the kind described and in combination, a car body, a dumping door hinged to the car body, controlling means for said door, comprising a holding member pivotally mounted on the car body and arranged to cooperate with the free edge of the door when closed to maintain the same in closed position, a rotatable shaft, a flexible connecting member connected with said shaft and holding member, and arranged to coact with the free edge of the door, and means for controlling said holding member comprising a gravity locking latch pivotally carried by said member and arranged to cooperate with the car body, and a flexible connecting member secured to said rotatable shaft and to said latch.

2. In a device of the kind described and in combination, a car body, doors carried thereby, means for closing said doors and maintaining them in closed position including a hook shaped holding member, a winding shaft and a flexible member co-acting with the doors and secured to said shaft and holding member, and means for maintaining said holding member in operative engagement with the doors, or positively disengaging the same, comprising a gravity latch member pivotally carried by said holding member and arranged to cooperate with the car body, and means for operatively connecting said latch with said winding shaft.

3. In a device of the kind described and in combination, a car body, doors carried thereby, means for closing said doors, including a hook shaped holding member, a winding shaft and a flexible member arranged therebetween, and a gravity latch carried by said holding member, said latch

connected to and controlled by said winding shaft and arranged to positively force said holding member out of operative position upon the unwinding of said flexible member or positively retain the same in operative position.

4. In a device of the kind described and in combination, a car body, a plurality of doors carried thereby, a holding member carried by said car body, a winding shaft, and flexible means connecting said winding shaft and said holding member and an auxiliary flexible controlling member secured to said shaft and operatively connected to said holding member and arranged to work supplemental to said first mentioned flexible member in the opposite direction.

5. In a device of the kind described and in combination, a car body, having inwardly inclined ends terminating proximate to the center of the car, a pair of doors arranged at the termination of each of said ends, means for closing said doors and holding the same in their closed position, and auxiliary means for positively locking the door holding means in operative position comprising a gravity latch, and means for operating said latch to release the holding means when desired.

6. In a device of the kind described and in combination, a car body, having inwardly inclined ends terminating proximate to the center of the car, a pair of doors arranged at each of said ends, means for pivotally connecting said doors to form pairs, means for closing and holding said doors in their closed positions, including a winding shaft and gravity means controlled by said winding shaft for positively controlling said closing and holding means to open said doors.

7. In a device of the kind described and in combination, a car body, having inwardly inclined ends terminating proximate to the center of the car, a pair of oppositely inclined doors arranged at each of said ends, a locking member for each of said pairs of doors, controlling means for said locking members comprising a winding shaft and a flexible member operatively connecting said shaft and said locking member and auxiliary means controlled by said winding shaft for controlling said locking member comprising a flexible member operatively connecting said shaft and said member.

8. In a device of the kind described and in combination, a car body having inwardly inclined ends, a plurality of doors pivotally supported transversely the car at each of said ends, means for connecting said doors to form pairs, each of said pairs provided with a hooked locking member and controlling means for said locking member, including a plurality of flexible members and means for simultaneously operating said flexible members.

9. In a device of the kind described and in combination, a car body having inwardly inclined ends terminating proximate to the center of the car, a plurality of beams extending lengthwise through the center of the car, a winding shaft arranged lengthwise the center of the car, a door arranged on each side of said beams at each of said body ends, means for pivotally connecting the doors at each of said ends to form a pair, means for closing and locking said doors in their closed position, comprising a locking member carried by said beams, a flexible member secured to said locking member and to said winding shaft and controlling means for said locking member comprising a latch carried thereby and a flexible member connecting said latch and said winding shaft.

10. In a device of the kind described and in combination, a car body having inwardly inclined ends terminating proximate to the center of the car, a plurality of beams extending lengthwise through the center of the car, a winding shaft arranged lengthwise the center of the car, a door arranged on each side of said beams at each of said body ends, means for pivotally connecting the doors at each of said ends to form pairs, means for closing and holding said doors in their closed position, comprising a holding member carried by said beams, a flexible member secured to said holding member and to said winding shaft and controlling means for said holding member comprising a latch carried thereby and a flexible member connecting said latch and said winding shaft, said flexible member arranged to work supplemental to said first mentioned flexible member in the opposite direction.

11. In a device of the kind described and in combination, a car body, having inwardly inclined ends terminating proximate to the center of the car, a pair of oppositely inclined doors arranged at the termination of each of said inclined ends, each pair of said doors provided with closing and holding means, comprising a holding member carried by the car body, a winding shaft and flexible connecting means arranged between said holding member and said winding shaft, said flexible means arranged substantially back of said doors and an auxiliary flexible member operatively connecting said shaft and said holding member, said auxiliary flexible member arranged to be strained on the unwinding of said first mentioned flexible member.

12. In a dumping car, the combination of a car-body, a dumping door hinged to the car, a holding member hinged to the car and adapted to maintain the door in closed position, a flexible operating means connected to said holding member and co-acting with the door whereby actuation of said

flexible means closes the door and moves the holding member into position to keep the door closed, a gravity actuated latch cooperating with said holding member and adapted to maintain the latter in door locking position, and means to move said latch to release said holding member, substantially as described.

13. In a dumping car, the combination of a car-body, a dumping door hinged to the car, a holding member hinged to the car and adapted to maintain the door in closed position, a latch cooperating with said holding member to hold the latter in door locking position, and a common operating means to actuate said holding member and latch, said operating means co-acting with the door and adapted to close the latter and move the holding member into position to maintain the door closed, said operating means being also adapted to release said latch, substantially as described.

14. In a dumping car, the combination of a car-body, a dumping door hinged to the car, a holding member hinged to the car

and adapted to maintain the door in closed position, a latch cooperating with said holding member to keep the latter in door locking position, an operating shaft, a chain connected to said holding member and adapted to be wound on said shaft in one direction, and a second chain connected to said latch and adapted to be wound on the shaft in the opposite direction, whereby when the shaft is turned in one direction the holding member chain by cooperation with the door closes the latter and moves the holding member to door locking position, the shaft when turned in the other direction unwinding the holding member chain and winding up the latch chain to release the latch, substantially as described.

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

JOHN PEARSON.

Witnesses:

ROY W. HILL,
CHARLES I. COBB.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."