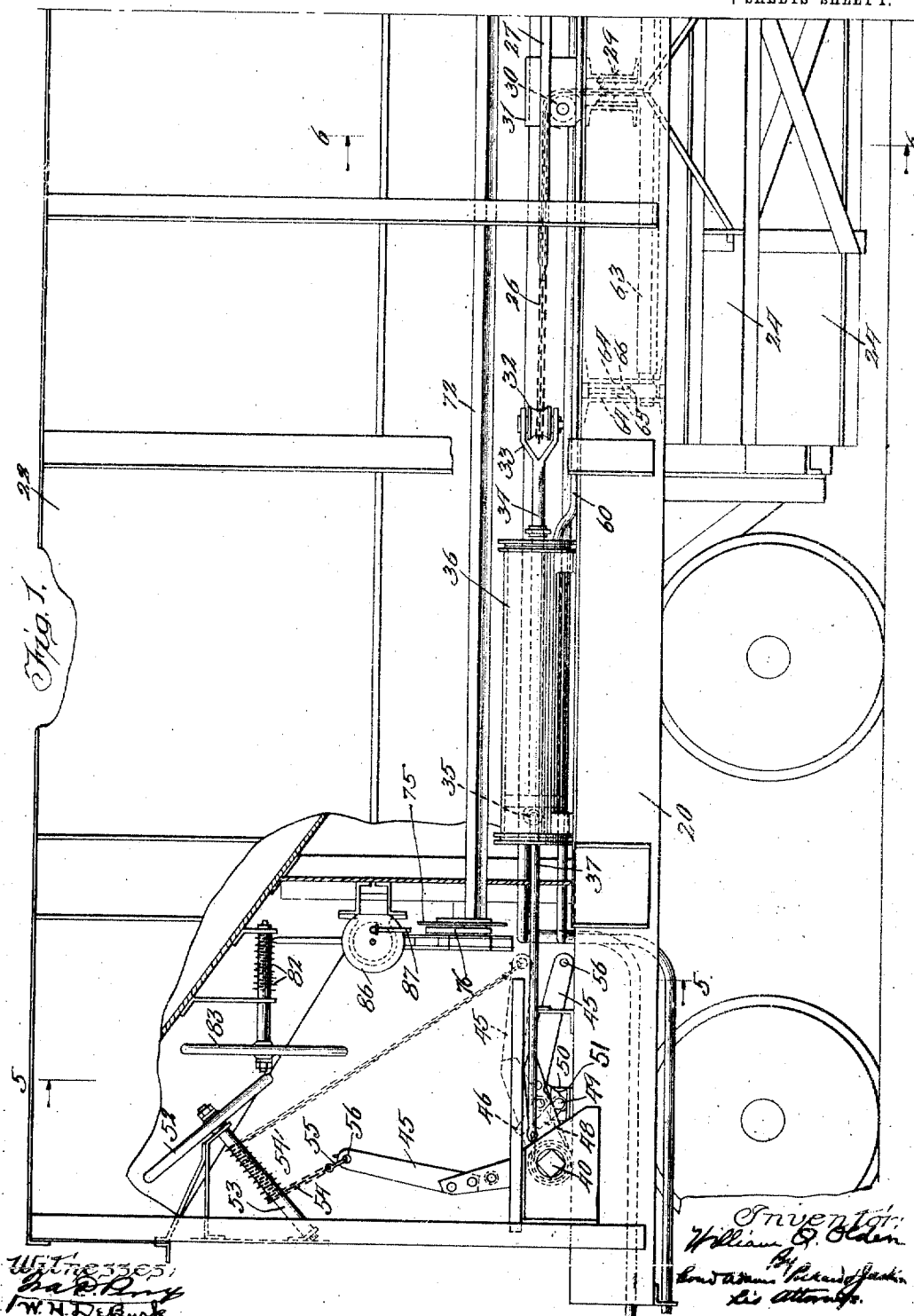


DUMP CAR.

Patented Aug. 15, 1911.

7 SHEETS—SHEET 1.

1,000,753.



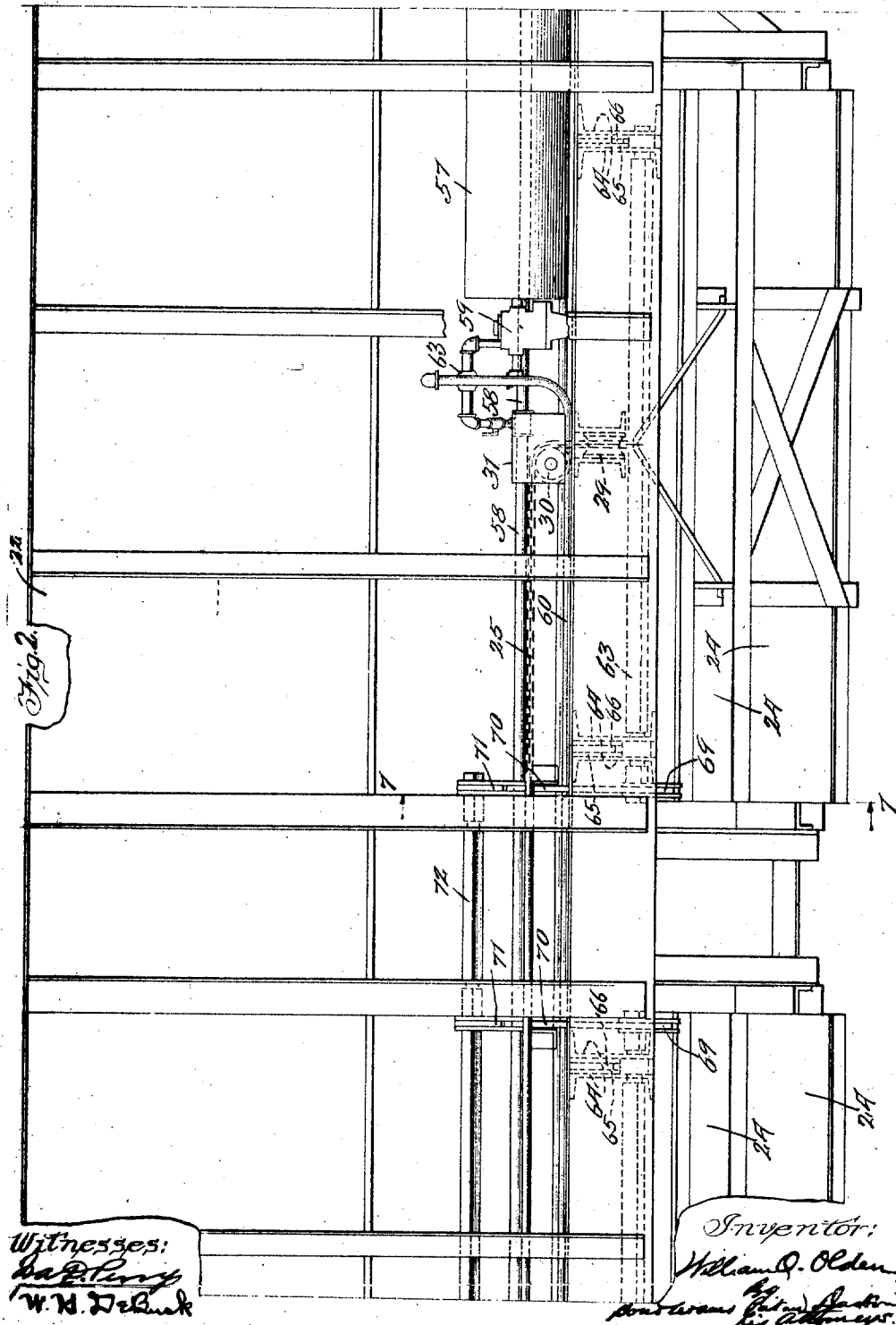
W. Q. OLDEN.
DUMP CAR.

APPLICATION FILED DEC. 1, 1909.

1,000,753.

Patented Aug. 15, 1911.

7 SHEETS—SHEET 2.



W. Q. OLDEN.

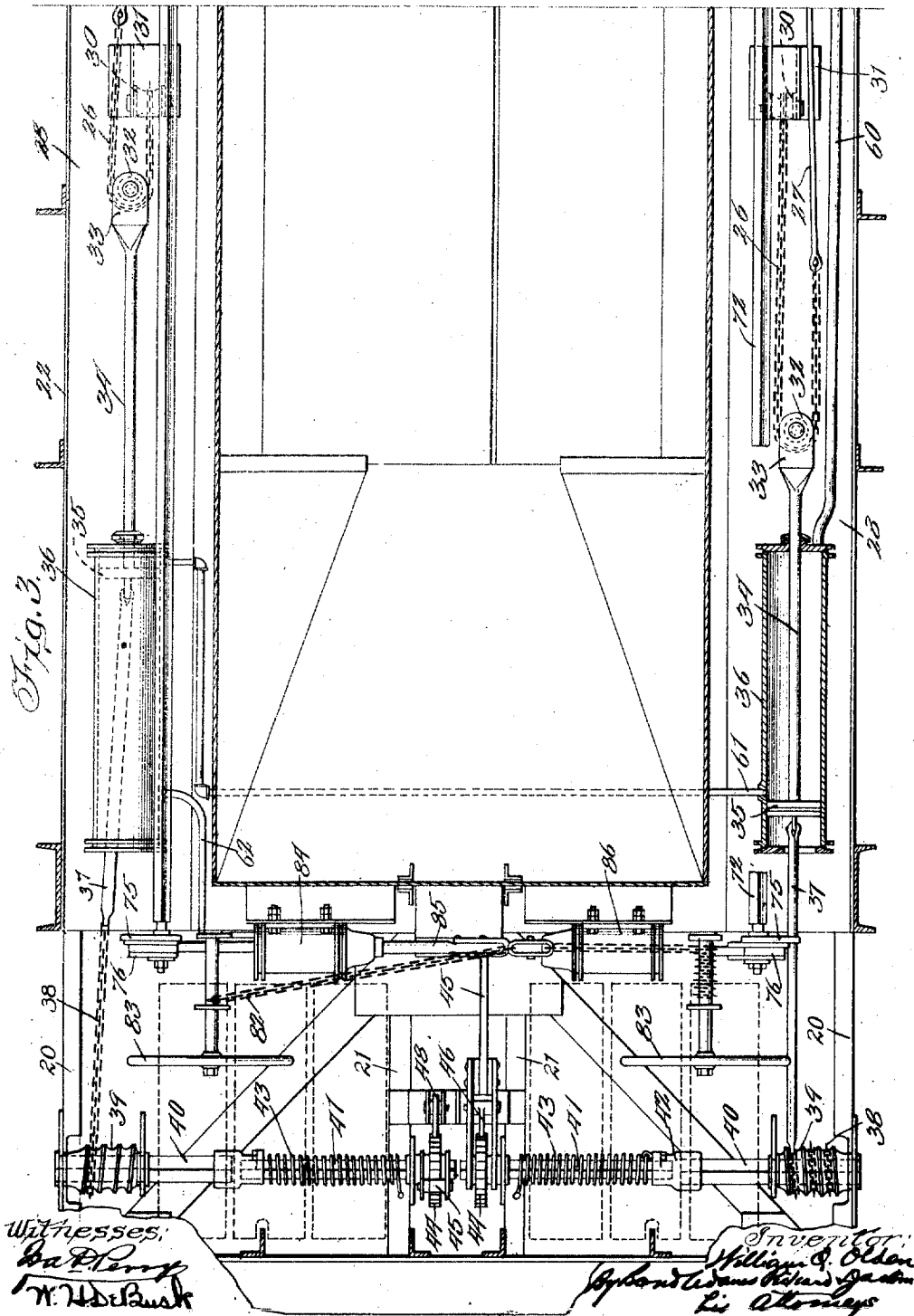
DUMP CAR.

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Patented Aug. 15, 1911.

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W. Q. OLDEN.

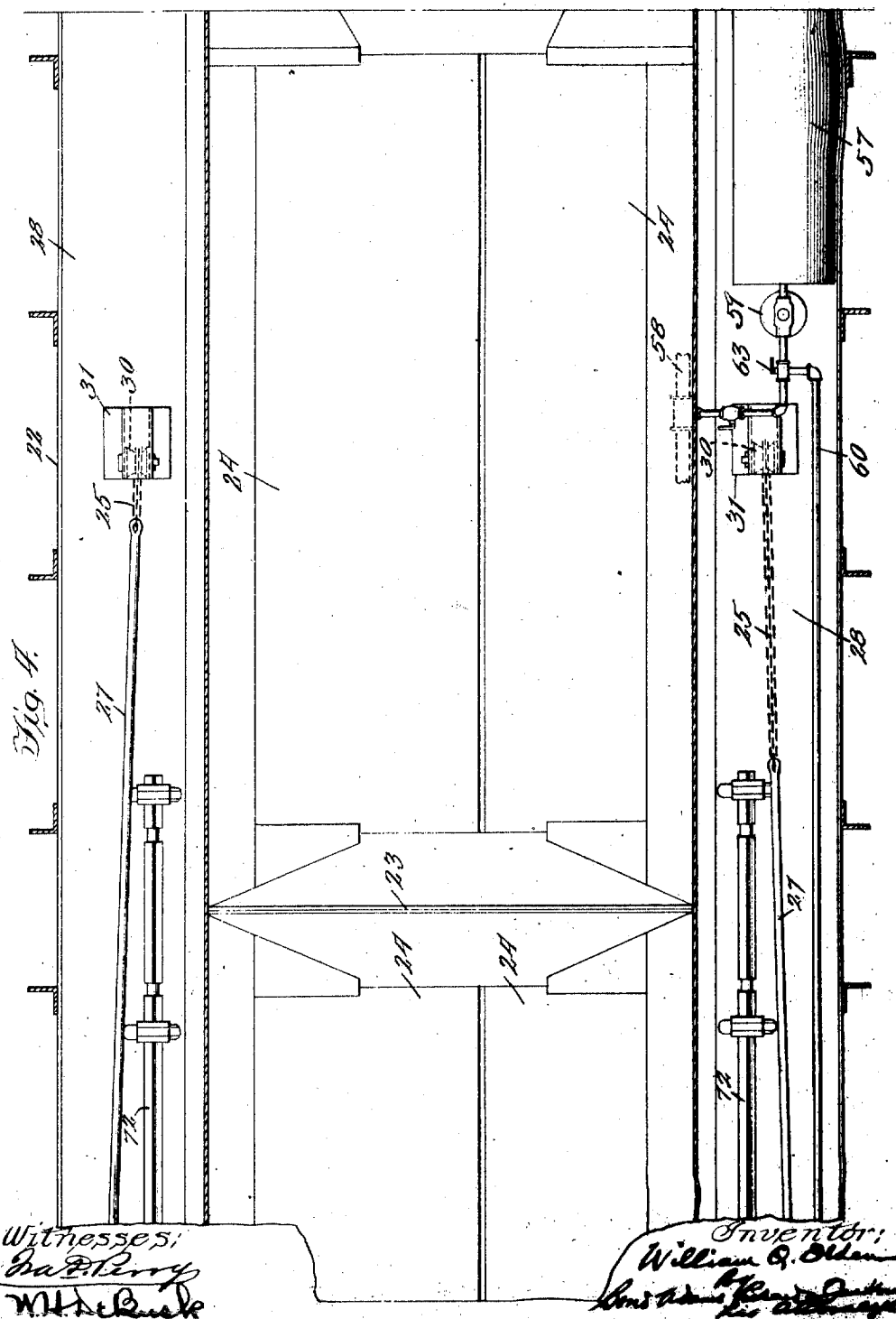
DUMP CAR.

APPLICATION FILED DEC. 1, 1909.

Patented Aug. 15, 1911

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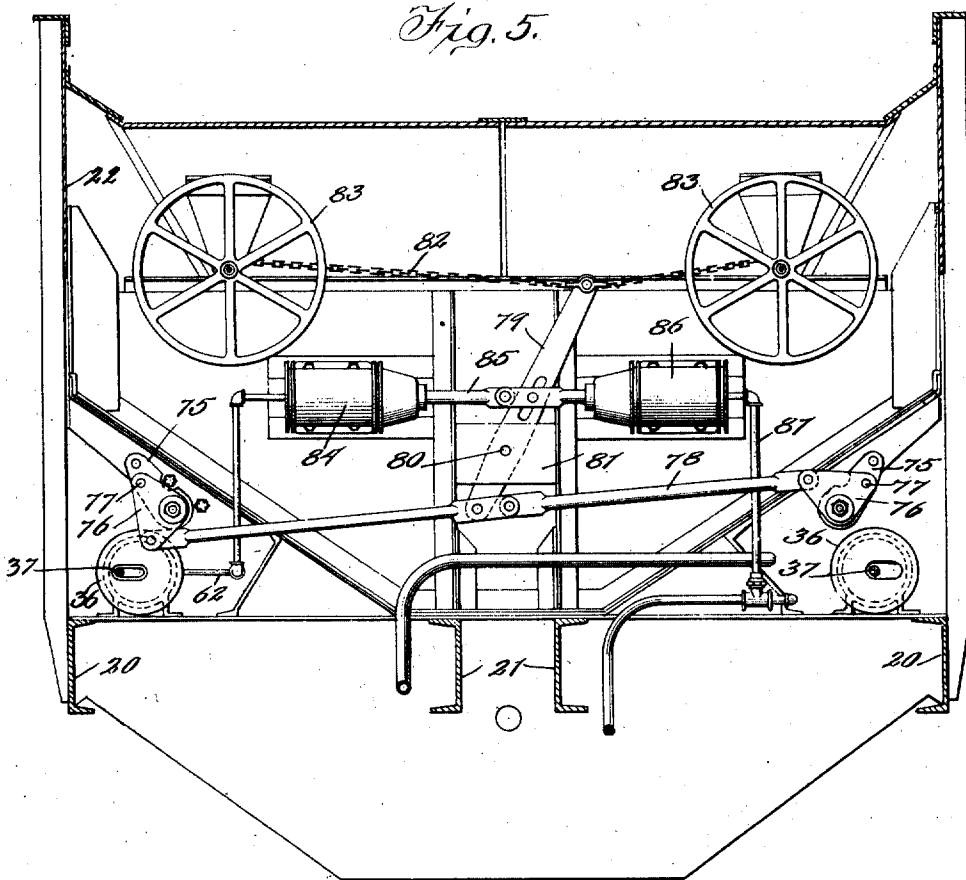
DUMP CAR.

APPLICATION FILED DEC. 1, 1909.

1,000,753.

Patented Aug. 15, 1911.

7 SHEETS—SHEET 6.



Witnesses:
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DUMP CAR.

Patented Aug. 15, 1911.

7 SHEETS—SHEET 6.

Fig. 6.

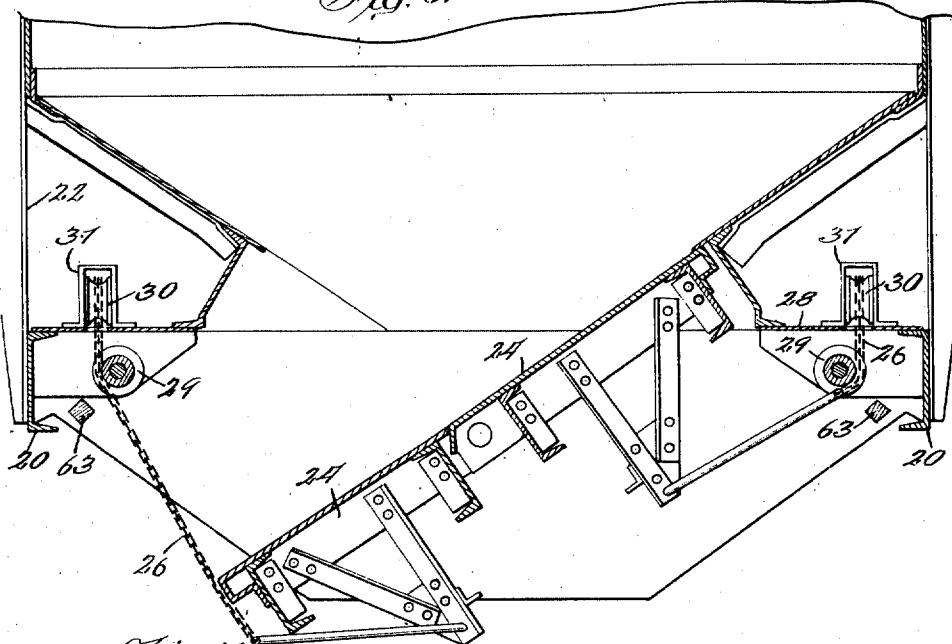
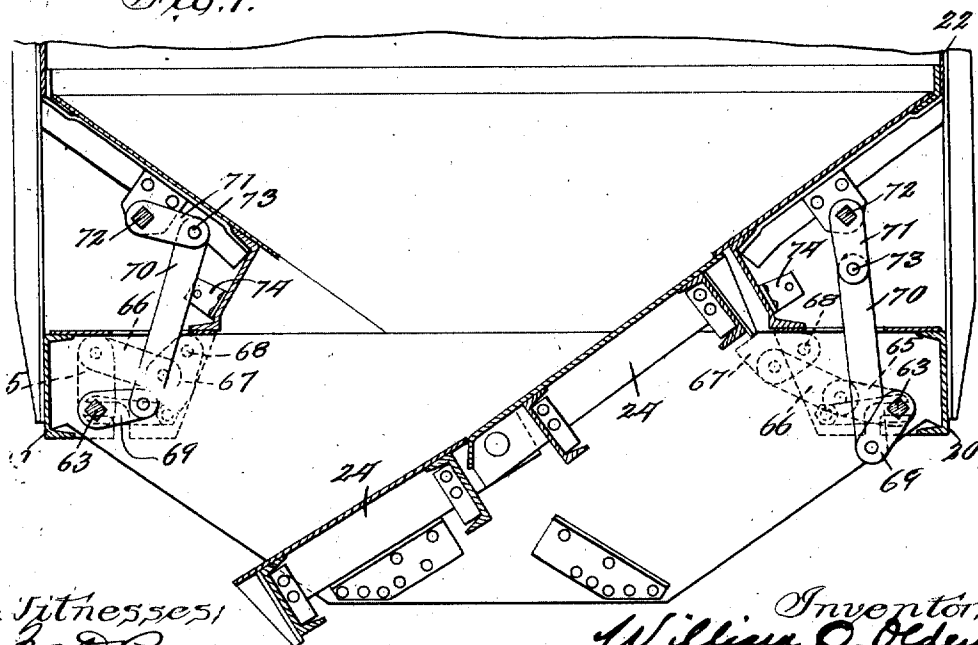


Fig. 7.



Fitnesses,
bad temp
W.H. & Busk

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1,000,753.

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APPLICATION FILED DEC. 1, 1908.

Patented Aug. 15, 1911.
7 SHEETS—SHEET 7.

Fig. 8.

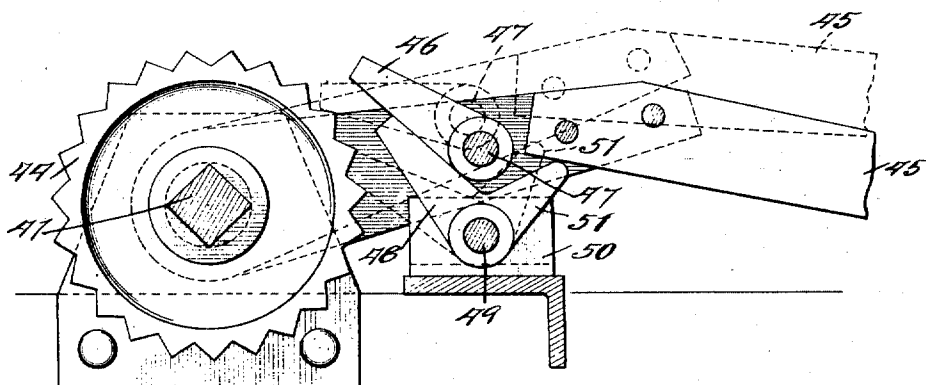


Fig. 9.

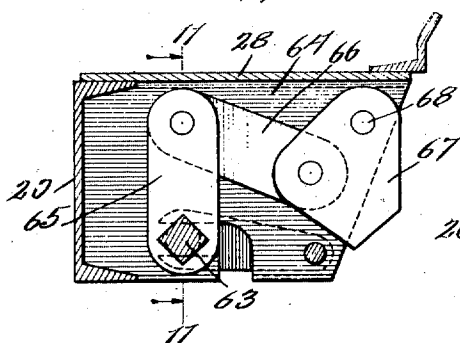


Fig. 10.

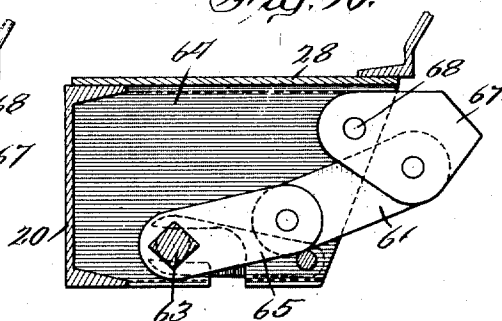
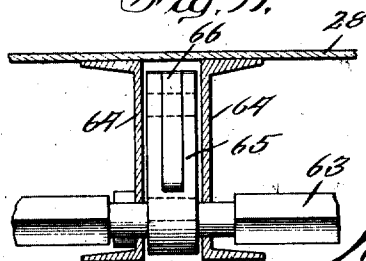


Fig. 11.



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UNITED STATES PATENT OFFICE.

WILLIAM Q. OLDEN, OF JOLIET, ILLINOIS—

DUMP-CAR.

1,000,753.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed December 1, 1909. Serial No. 530,742.

To all whom it may concern:

Be it known that I, WILLIAM Q. OLDEN, a citizen of the United States, residing at Joliet, in the county of Will, State of Illinois, have invented certain new and useful Improvements in Dump-Cars, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in dump cars of the same general type shown and described in Letters Patent No. 929,104, dated July 27, 1909, granted upon my application, in which, as there shown, the car-body is provided with two large hopper-like chambers the lower ends of which are closed by a plurality of swinging doors so arranged as to discharge material toward opposite sides of the car.

One of the leading objects of the present invention is to provide novel closing means to which all the doors at a side of the car are connected and which will compel each of said doors to be brought to a perfect closing position and ready to be locked, and this too regardless of whether the doors move exactly in unison or, by reason of the lifting chains being attached unequally or for other cause, some one or more of the doors comes to a full closing position after the other door or doors has or have been closed.

Another object is to improve the locking mechanism employed in connection with the swinging doors whereby any of the doors or any number of such doors may be quickly and readily disconnected from the mechanism that is employed for simultaneously unlocking the doors to allow of material being dumped, so that such door or doors will remain closed while the remainder of the doors at that side of the car will be unlocked by the operation of the general locking mechanism referred to.

It is a further object of the invention to provide improved means for locking all of the doors immediately after they have been raised into closed position, and in the event that the doors are raised by the air-pressure devices referred to, to automatically move such locking mechanism by air pressure.

I accomplish these stated objects as well as improve generally the construction and operation of dump cars of the type mentioned by the devices and combinations of devices shown in the drawings and herein- after specifically described.

That which I believe to be new will be pointed out in the claims.

In the drawings:—Figures 1 and 2 together constitute a side elevation of a car embodying my improvements, a portion of the car-body being broken away in Fig. 1 to illustrate some of the operating mechanism located at the end of the car, and the other end portion of the car being omitted in Fig. 2. Figs. 3 and 4 together constitute a plan view,—some parts being in section,—of so much of the complete car as is shown in Figs. 1 and 2. Fig. 5 is a section through the car-body at the line 5—5 of Fig. 1 and showing in elevation some of the door operating mechanism. Figs. 6 and 7 are vertical cross-sections taken respectively at lines 6—6 of Fig. 1 and 7—7 of Fig. 2. Fig. 8 is an enlarged detail, being a side elevation of the lever and pawl-and-ratchet means employed to raise by hand the doors at one side of the car. Fig. 9 is a detail of one of the door latches and a part of the mechanism for operating the same, the latch being in inoperative position. Fig. 10 is a view of the same parts shown in Fig. 9 but with the latch projected into the position it will occupy when holding a door in closed position. Fig. 11 is an edge view of the devices of Fig. 9, the supporting parts for such devices being in section,—the section being taken on line 11—11 of Fig. 9.

Referring to the several figures of the drawings, in which corresponding parts are indicated by like reference characters,—20 indicates the side sills of the car, preferably formed of heavy channel pieces, and 21 indicates the central sill, made also as shown of channel pieces spaced a distance apart as shown in Fig. 5. As stated in the said Letters Patent, No. 929,104, the central sill is not continuous from end to end, as it does not extend across the delivery openings in the bottom of the car.

22 indicates the body of the car.

The car is divided centrally, as shown in Fig. 4, by partition 23, thus forming two large compartments having sloping sides and ends. The bottoms of these compartments are normally closed by two doors for each compartment, the doors being indicated by 24. The doors are hinged along the central line of the car, as shown, and are preferably constructed as fully described in my said form patent. To the doors at each

side of the car is attached a flexible connection which as shown consists of two chain sections 25—26 and an intermediate rod section 27. One end of each chain section is 5 attached in any suitable manner to one door, the other ends of the chain sections being attached to the ends of the rod sections as shown. The attachment to the doors is preferably through the intervention of a hinged 10 bail, as shown, and as described in my said former patent. Instead of forming the flexible connection of two chain sections and the intermediate rod section, it is obvious of course that a continuous chain might be 15 employed, but inasmuch as the central portion does not have to pass around any pulleys, I prefer to interpose the rod section as being less liable to stretching or distortion than chain links.

20 That portion of the flexible connection formed by the chain section 25 passes up through a suitable opening in the usual long plate 28 that extends from end to end of the car at the side of the car and over a suit- 25 ably-journaled pulley 29 and thence over a pulley 30 at right angles to the pulley 29 so as to direct the chain toward that end of the car where the operating mechanism is located. The pulley 30 is preferably covered by a suitable housing 31. The other 30 end of the flexible connection referred to,—namely the chain section 26, in like manner is led over a pulley 29 and around a pulley 30, and, as clearly shown in Fig. 3, is looped 35 around a pulley 32 which is journaled in a yoke 33 at the end of a rod 34, which, in the construction shown, is the rod of a piston 35 movable in a cylinder 36. At the opposite side of this piston 35 is connected 40 another rod 37 which has attached at its opposite end a chain 38 adapted to be wound upon a drum 39 extending transversely of the car. This drum is mounted upon a shaft 40 suitably supported in bearings. 45 The shaft 40 in the construction shown is locked end to end to another shaft 41 by means of a suitable socketed casting 42. The shafts 40 and 41 therefore in effect are a single shaft and might if desired be made 50 of a single piece, although I find it a practical advantage to make it in two parts as described. Around the shaft member 41 is a strong coiled spring 43 having one end secured to the coupling connection 42 and its 55 other end secured to a fixed part of the car frame. The tendency of this spring is to keep the chain 38 coiled on the drum 39. The inner end of the shaft section 41 is adjacent to the longitudinal center of the car, as clearly shown in Fig. 3, and it has fixedly 60 secured to it near that end a ratchet-wheel 44.

45 indicates a lever, loosely journaled upon the shaft 41, the lever in the construction shown being bifurcated so as to straddle

the ratchet wheel 44. As shown, this lever is not made of a single piece but the handle portion lies between the two members that straddle the ratchet-wheel 44 and is riveted 70 to such parts, suitable filler blocks being interposed between the handle portion and the bifurcated end members, as clearly shown in Fig. 3. An ordinary one-piece bifurcated lever of course could be used. 75 Between the forked ends of this lever 45 and a short distance from the ratchet-wheel 44 is journaled at 47 a pawl (see Fig. 8) 46, adapted to engage the teeth of the ratchet-wheel 44 and turn such ratchet-wheel when 80 the lever is raised, the pawl of course sliding over the ratchet-teeth when the lever is being depressed. Immediately below the pawl 46 when the lever is depressed, is pivotally secured a locking dog 48, the pivot 85 of the same being indicated by 49. This pivot 49 is supported in a fixed bracket 50. The dog 48 at the opposite side of the pivot is provided with a short upwardly-projecting arm 51 which is adapted to be contacted 90 by the lower edge of the lever 45. When the lever 45 is raised, as is indicated in Fig. 8 in dotted lines, so as to remove it from contact with the arm 51, the dog 48 will fall into position against the ratchet-wheel 44 to lock the same against backward rota- 95 tion, the pawl 46 at the same time falling into position to cause a rotation of the ratchet-wheel as the lever continues to be turned upward. When the lever is moved downward sufficiently far to come in con- 100 tact with the arm 51, the dog 48 will be forced out of locking engagement with the ratchet-wheel 44, and, as it rises, will turn the pawl 46 also out of engagement with the ratchet-wheel, leaving the ratchet-wheel 105 free to rotate backward to permit the doors 24 to drop. This lever 45 is employed to raise the doors at one side of the car by hand power, the hand power being applied through a hand wheel 52 fixed on the end 110 of a shaft 53 journaled in suitable supports, as clearly shown in Fig. 1. To this shaft 53 is secured one end of a chain 54, the other end of which chain is equipped with a hook 55 that is adapted to be readily inserted in 115 and withdrawn from a hole 56 in the lever 45 near the free end thereof.

To sufficiently wind the chain 38 upon the drum 39 so as to insure the complete 120 closing of the doors, the lever 45 must be moved up and down several times, according to the construction illustrated, and it is therefore important that the chain, when fully let out from the shaft 53, be not long 125 enough to permit the lever 45 to be swung down sufficiently to contact with the arm 51 of the dog 48, because, if that happened, the said dog would be released from locking en- 130 gagement with the ratchet-wheel as before described and allow the partially raised

doors to fall. It will be understood that by thus reciprocating the lever 45 through the operation of the hand wheel 52, the chain 38 will be wound up on the drum 39, drawing toward the drum the rods 37 and 34, as well as the piston interposed between them and drawing also the flexible connection consisting of the chain sections 25—26 and the interposed rod section 27. These chain sections 25 and 26, connected as they are to the front ends of the two swinging doors, necessarily pull those doors toward a closed position, and, assuming that the doors are of the same weight, that the chain sections are of the same length, and that each door moves toward closing position with the same amount of frictional resistance, both doors will be brought into raised position practically at the same time. If, however, these conditions with reference to each door are not equal for any cause, one door will be brought to a closed position ahead of the other, but, by the construction provided wherein one chain section is looped around a pulley that travels lengthwise of the car, the door that lags behind in its closing,—whether due to its chain section having become unduly elongated from use, or because of undue frictional or other resistance,—must be brought to an absolutely tight closing position the same as the other door because the pulley 32 will rotate sufficiently during its bodily movement toward the end of the car to permit of a drawing up of the chain section attached to the slower-moving door so as to insure such slower-moving door coming to place, and this too without in any wise releasing the upward pull necessary to hold the other door in position. This feature I consider of great value, as it does away with the necessity of maintaining the lifting chains always of exactly the same length.

The mechanism so far described is duplicated at each side of the car, and it is necessary when raising these doors by hand as just described to separately operate the two sets of mechanism for raising the doors at the two sides. I contemplate, however, the raising of the doors when desired by power, and to that end I have provided air mechanism which I will now describe.

57 indicates a reservoir suitably secured in place on the car and supplied with air from the usual train pipe 58 through a triple valve 59, the connection being the same as in the use of the ordinary air-brakes. A reduction of air in the train pipe 58 causes air to flow through the pipe 60 into the cylinder 36, forcing the piston therein back until a port near the inner end of such piston is uncovered allowing the air to escape therethrough into a cross-pipe 61 from whence it is conducted into another cylinder 36 at the opposite side of the car and forcing

ing back therein the piston 35 in that cylinder. When that piston has been forced back to the limit of its stroke, all four doors of the car will have been tightly closed by the successive pulls exerted on the two flexible connections already described. When the piston 35 that last acts to close the doors on its side of the car has about reached the limit of its inward stroke, it uncovers a port that permits the air to rush into a pipe 62, from which it is conducted to one of a pair of cylinders suitably mounted near the end of the car and whose function will be hereinafter described. A four-way valve 63 permits the reservoir 57 to be cut out and the apparatus used as in straight air brakes.

I provide locking mechanism for securing the doors in their closed position, the same being of substantially the same character as that described in my said former Patent, No. 929,104, but differing from what is described in that patent in that provision is made for permanently securing the locking mechanism of any one or more of said doors from being affected by the turning of the rock-shaft. The locking mechanism referred to is described as follows:—63 indicates a shaft, preferably angular in cross-section, as shown, except at its bearing portions, one of such shafts being provided for each door and being of a length substantially the same as the length of the door. Each of these shafts is suitably journaled near its ends in a pair of brackets 64 formed of short sections of channel-iron that are secured near the inner face of one of the side sills 20. The portion of the shaft 63 between the channel-iron pieces 64 is squared or angular, as indicated in Fig. 11, and to this squared portion is secured one end of a link 65 between the forked upper end of which is pivotally attached another link 66, which at its other end is pivotally attached to an irregular-shaped block 67 that constitutes the holding latch proper, said latch itself being pivoted to a pin 68, the ends of which are secured in the channel-iron supports 64. The links 65 and 66 together form a pair of toggle arms, as described in my said patent. As stated in said patent, there is a pair of these supporting channel-irons near each end of a door, and a latch and operating devices are provided in connection with each set of supports so that a door may be latched and firmly supported near each of its ends. At one end of each angular shaft 63 is secured a short link 69, to the other end of which is pivotally attached an arm 70, to the upper end of which arm is pivotally attached a link 71 that is in turn connected fixedly to a long rock-shaft 72, the rock-shaft being suitably supported, as for example as described in my said former patent, and projecting toward that end of the car where is located the door-operating mechanism that

has been described. The turning of this rock-shaft 72 throws the latches 67 that are controlled by it into and out of operative position, as is fully explained in my said patent. It is understood that the latching devices are duplicated for each side of the car.

In my said former patent, when a rock-shaft 72 was operated, the latching mechanisms for both door at one side of the car were simultaneously operated and had to be simultaneously operated. In my present construction, the latching mechanisms for both doors can be operated together, or, if desired, one door can be permanently locked in place so as to be unaffected by the turning of the rock-shaft 72, but such permanent locking of the one door will not affect the latching or unlatching of the other door. I accomplish this object by making the pivot 73 that unites the arm 70 and link 71 of each set of a removable pin and by providing a fixed bracket 74 at one side of the arm 70 through a hole in which can be passed a pin or other locking device and thereby firmly secure the arms 70 to said bracket. With the arm 70 and link 71 disconnected as suggested and the arm 70 locked in this manner to the bracket 74, it is evident that the turning of the rock-shaft 72 can have no effect upon the latch connected with the arm 70, and it is also evident that when said arm 70 is locked to the bracket 74 the latch 67 connected with said arm 70 cannot be disturbed and therefore the door will be, for the time being, firmly locked in place.

At the end of each rock-shaft 72 is fixedly secured a short crank arm 75, and also on the said rock shaft and lying next to the said crank arm is a bell crank lever 76, which, however, is not fixedly secured to the said shaft so as to rotate therewith but is free to rock independently thereof. This bell crank lever is provided, as shown, (see Fig. 5) with a hole 77 through which a pin is adapted to be passed and also through a corresponding hole in the crank arm 75, thus for the time being locking together said bell crank lever and said crank. To each bell crank 76 is pivotally attached one end of a long connecting rod 78.

79 indicates a vertically-disposed lever pivoted at 80 to a fixed support 81. At its upper end, this lever is suitably connected to a chain 82, the ends of which are secured to and adapted to wind upon the shafts of two hand wheels 83—83 located at the end of the car and near opposite sides thereof.

The two bell cranks 76 are similar, but are differently positioned upon their respective rock-shafts 72, whereby, upon the turning of the lever 79, they will be caused to simultaneously turn their respective rock-shafts, assuming that they are secured to their respective cranks 75 as described, so that the

latching mechanism at each side of the car will be simultaneously operated and in the same manner. It is evident that if it is desired to unlatch the doors at one side of the car only so as to dump only at that side, the bell crank lever at that side of the car will be locked to its adjacent crank 75, while the bell crank and crank arm at the opposite side will be disconnected. The disconnected bell crank will move freely back and forth but of course cannot have any effect on the rock shaft 72 at that side of the car.

By the construction described, it is further evident that not only can both doors at one side of the car be left locked while the others are being opened, but that by locking both bell cranks to their respective cranks 75 all of the doors can be simultaneously opened, or, by the proper disconnection from the latching mechanism of certain of the arms 70 and locking them to their respective brackets 74, any one or more of the doors on either or both sides of the car may be disconnected and removed from the effect of the general unlatching mechanism.

Having now described the manner of operating the latching mechanism by hand, I will proceed to describe how the same operation is performed by the power mechanism provided.

I have hereinbefore called attention to the fact that the air, after having moved both pistons in the respective cylinders 36, escapes through a pipe 62. From such pipe it passes into the rear end of one of a pair of cylinders arranged at the end of the car, the cylinder into which it passes being indicated by 84. This cylinder is provided with the usual piston whose piston rod 85 is suitably connected with the vertically-disposed lever 79, and hence as the piston is pushed out that lever 79 will be swung on its pivot 80, turning the respective cranks 76 through the cross rod 78, and, through the consequent movement of the rock-shafts 72, causing a latching of the doors, as before described. The other cylinder referred to is indicated by 86 and is provided also of course with a piston, the rod for which is the same rod 85 that is connected to the piston in the cylinder 84. The vertically-disposed lever 79 can be turned in the other direction to release the latches from locking position by the admission of air through a pipe 87, when desired.

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

1. In a dump car, the combination with two swinging doors at one side of the car, of a flexible connection secured to both of said doors, guiding devices over which said connection passes, one of said guiding devices being bodily movable, and means for moving said last-named device.

2. In a dump car, the combination with

two swinging doors at one side of the car, of a flexible connection secured to both of said doors, a fixed guide and a traveling guide over both of which said flexible connection passes, and means for moving said traveling guide.

3. In a dump car, the combination with two swinging doors at one side of the car, of a flexible connection secured to both of said doors, a fixed guide and a traveling guide over both of which said flexible connection passes, a cylinder, a piston therein, a piston rod, means for supplying air under pressure to said cylinder to move said piston, and means for connecting said piston-rod with said traveling guide.

4. In a dump car, the combination with two swinging doors at one side of the car, of a flexible lifting device connected with both doors, a traveling guide pulley engaging a loop portion of said lifting device, and means for moving said pulley.

5. In a dump car, the combination with a swinging door at each side of the car, of two cylinders each provided with a piston, means for connecting each door with a piston, and means for supplying air under pressure to one of the cylinders and after the piston therein has been forced back opening a port to conduct the air to the other cylinder, whereby the doors on opposite sides of the car are successively operated.

6. In a dump car, the combination with a swinging door and means for moving it into closed position, of a latch adapted to engage and hold the door closed, a rock-shaft suitably journaled in place near the side of the car and in proximity to such door, a link fast on said rock-shaft, an arm pivotally connected at one end by a removable pin to said link, means connecting said arm with said latch, and a device to which said arm is adapted to be attached when disconnected from said link.

7. In a dump car, the combination with a swinging door at each side of the car and means for moving them into closed position, of a latch for each door, rock-shafts suitably journaled in place near the sides of the car, means connected with such rock-shafts for operating the latches, arms fixedly secured upon the rock-shafts near the ends thereof, bell cranks loose upon the rock-shafts adjacent to said arms, means for removably attaching each bell crank to its adjacent arm, a rod connecting said bell cranks, and means for reciprocating said rod.

8. In a dump car, the combination with a swinging door at each side of the car and means for moving them into closed position, of a latch for each door, rock-shafts suitably journaled in place near the sides of the car, means connected with such rock-shafts for operating the latches, two arms secured upon the end of each rock-shaft, one of said

arms on each shaft being fast and the other loose on the shaft, means for removably connecting together a loose arm and a fast arm, a rod connecting said two loose arms, and means for reciprocating said rod.

9. In a dump car, the combination with a swinging door, of a latch for locking the same in closed position, a cylinder, a piston therein, means for supplying air under pressure to the cylinder, a connection between the piston and the door, a second cylinder with a piston therein, means for conducting the air from the first-named cylinder to the second-named cylinder after the door has been closed, and mechanism adapted to be operated by the said last-named piston to throw said latch into locking position.

10. In a dump car, the combination with a swinging door at each side of the car, of a separate latch for locking each door in closed position, two cylinders each containing a piston, means for connecting each piston with one of said doors, means for conducting air under pressure to one of said cylinders and from that cylinder to the other cylinder to cause a successive closing of the doors, and thereafter conducting the air from the last-named cylinder to a third cylinder provided with a piston, and means connecting said last-named piston with the several door latches.

11. In a dump car, the combination with a swinging door at each side of the car, of a separate latch for locking each door in closed position, two cylinders each containing a piston, means for connecting each piston with one of said doors, means for conducting air under pressure to one of said cylinders and from that cylinder to the other cylinder to cause a successive closing of the doors, and thereafter conducting the air from the last-named cylinder to a third cylinder provided with a piston, means connecting said last-named piston with the several door latches, and means for rendering the latching device at either side of the car inoperative without disturbing the operativeness of the other latch.

12. In a dump car, the combination with a swinging door, of air-operated means for closing the same, and air-operated means for thereafter locking the door.

13. In a dump car, the combination with a swinging door, of air-operated means for closing the same and other air-operated means connected with said first-named means for thereafter locking the door.

14. In a dump car, the combination with a swinging door at each side of the car, of air-operated means for successively closing the doors.

15. In a dump car, the combination with a swinging door at each side of the car, of air-operated means for successively closing the doors, a latch for each door and air-

operated means for throwing the latches into locking position.

16. In a dump car, the combination with a swinging door at each side of the car, of
5 air-operated means for successively closing the doors, a latch for each door, and air-operated means for simultaneously throwing the latches into locking position.

17. In a dump car, the combination with
10 swinging doors, of air-operated means for

closing the doors, a latch for each door, air-operated means for throwing the latches into locking position, and other air-operated means for withdrawing the latches from operative engagement with the doors.

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