

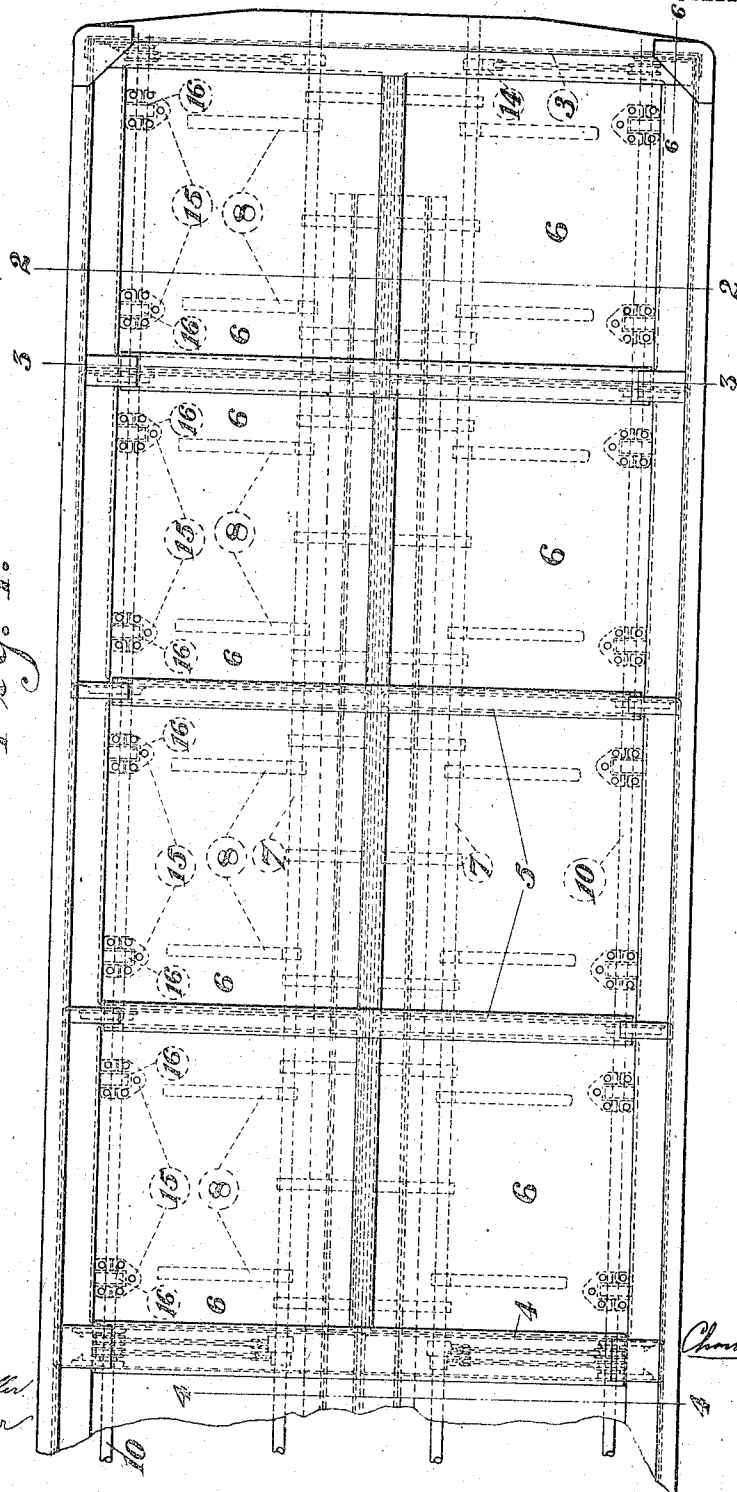
939,426.

C. A. LINDSTRÖM.
CAR DOOR OPERATING MECHANISM.
APPLICATION FILED APR. 8, 1909.

Patented Nov. 9, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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 4 SHEETS—SHEET 2.

Fig. 16.

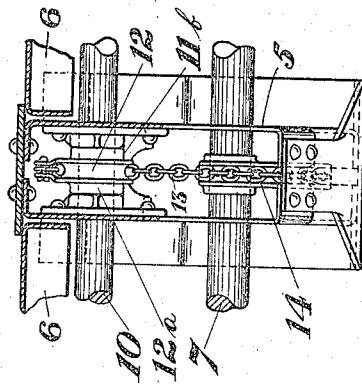


Fig. 7.

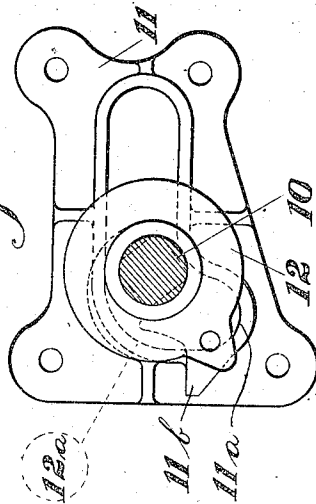


Fig. 2.

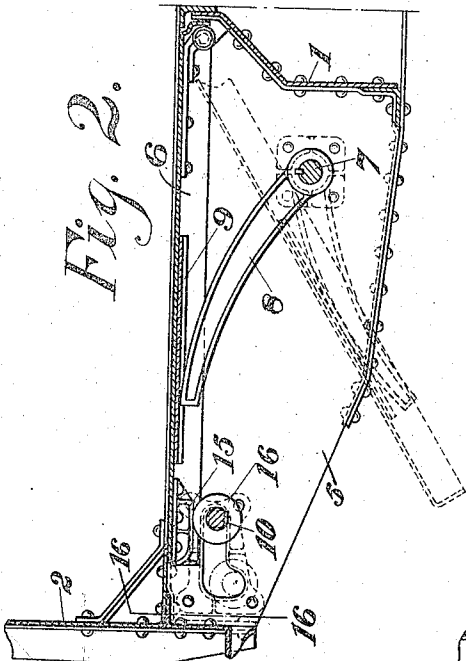
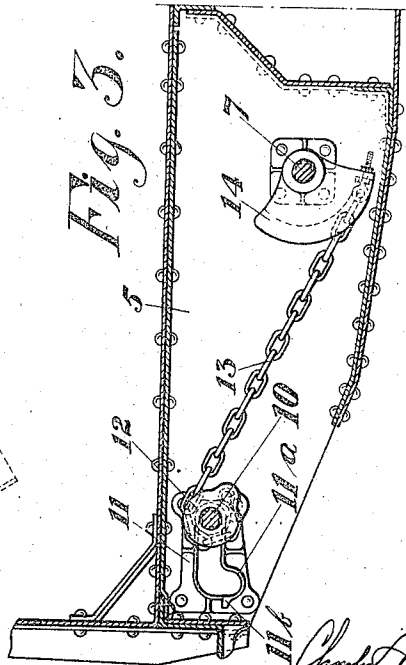


Fig. 3.



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Fig. 5.

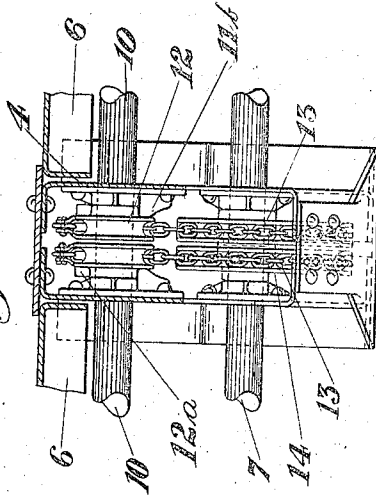


Fig. 4.

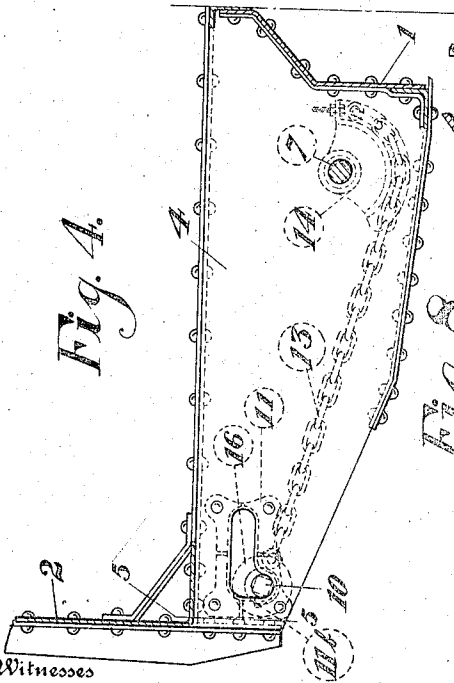


Fig. 8.

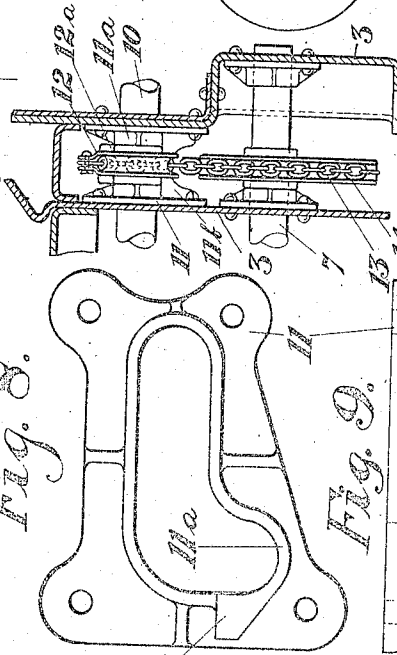


Fig. 10. Fig. 11. Fig. 12.

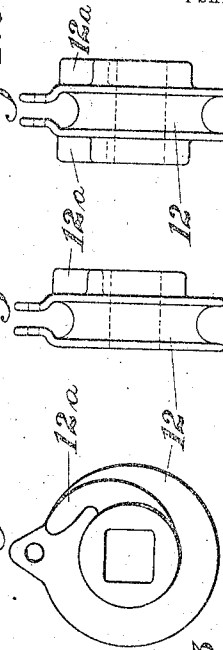


Fig. 9. Fig. 6.

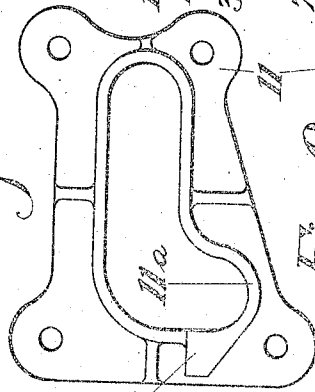


Fig. 9.

Fig. 6.

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4 SHEETS—SHEET 4.

Fig. 13.

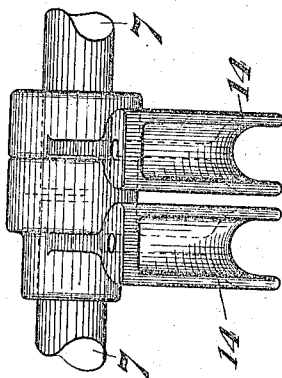


Fig. 14.

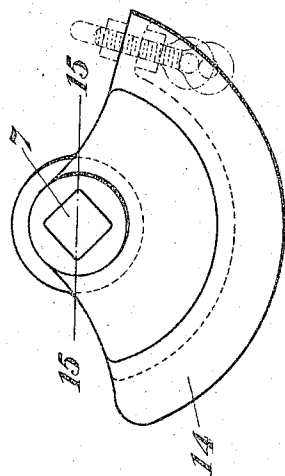
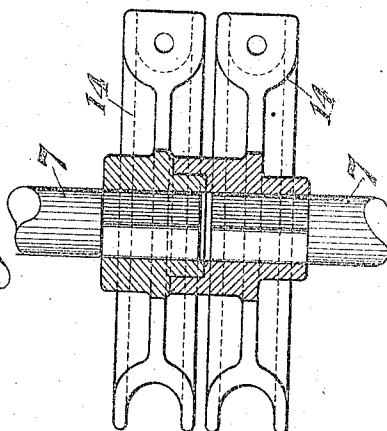


Fig. 15.



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UNITED STATES PATENT OFFICE.

CHARLES A. LINDSTRÖM, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO PRESSEL STEEL CAR COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

CAR-DOOR-OPERATING MECHANISM.

939,426.

Specification of Letters Patent.

Patented Nov. 9, 1909.

Application filed April 8, 1909. Serial No. 488,558.

To all whom it may concern:

Be it known that I, CHARLES A. LINDSTRÖM, a citizen of the United States, residing at Pittsburg, northside, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Car-Door-Operating Mechanism, of which the following is a specification.

An object of the present invention is to provide a door operating mechanism especially adapted for that type of freight cars known as general service cars in which the car bottom is flat, or nearly flat, and composed wholly, or almost wholly, of drop doors. Of course, the invention may be applied on one or any number of drop doors in any dump car.

A more specific object of the present invention is to provide a door mechanism and its details in which means is employed for raising the doors to closed positions, which does not extend across the free edge of the door at any time to interfere with the free discharge of the lading from the car, and, furthermore, to provide means for relieving the door-raising part of said mechanism from strain when the doors are in closed positions.

I will describe my invention as applied to a general service car in which the bottom of the car is flat, or nearly flat, and wholly composed of drop doors.

The invention is clearly, accurately and fully hereinafter described and shown in the accompanying drawings, in which like reference characters refer to like parts, and in which;

Figure 1 is a plan view of a part of a car of the type referred to embodying my invention. Fig. 2 is a transverse section through one-half of said car on the line 2—2, Fig. 1. Fig. 3 is a like view on the line 3—3, Fig. 1. Fig. 4 is a like view on the line 4—4, Fig. 1. Fig. 5 is a vertical section on the line 5—5, Fig. 4. Fig. 6 is a vertical section on the line 6—6, Fig. 1. Fig. 7 is a detail view of one of the shaft bearings, a section through the shaft and one of the shaft lifting pulleys, parts being broken away for sake of clear-

ness. Figs. 8 and 9 are detailed views of 50 one of the toothed slotted shaft bearings. Figs. 10, 11 and 12 show detail views of one of the shaft lifting pulleys. Figs. 13, 14 and 15 are detail views of the door lifting quadrants forming a part of the mechanism. Fig. 55 16 is a vertical section through a cross-bearer showing modified construction.

Referring now in detail to the drawings:— 1 represents the center sill construction of suitable formation, 2 the car side construction, 3 the car end sill, 4 the central cross-bearer of the car and 5 the cross-bearers intermediate the center cross-bearer and the end sill. These cross-bearers and the end sill are of suitable formation. The former 65 extends preferably, though not necessarily, only from the center construction 1 to the side construction 2. The end sill 3, of course, preferably extends entirely across the car.

6 are the car doors preferably hinged at the center construction 1 and discharging outwardly toward the side construction 2.

7 is a door raising shaft, there being preferably four to each car of the type referred to stationarily journaled beneath the doors nearer the hinged edges of the door than their free edges. Shafts 7 are suitably journaled in the cross-bearer of the car and extend from one end sill to the longitudinal center 80 of the car. Each of the shafts 7 is provided with one or more door raising arms 8 extending upwardly, when the doors are in closed positions, in a curved line and engaging wearing plates or shoes 9 on the under 85 side of the doors. The wearing shoes 9 engage the door raising arms 8 substantially at a tangent to said arms to provide, as far as possible, during operation a rolling action between the doors and arms, thus greatly reducing the friction. The means for operating shaft 7 is hereinafter described.

10 are door supporting shafts, preferably four to a car, each extending from end sill to longitudinal center of the car and operating 95 a plurality of doors and located in elongated slotted bearings 11 preferably at the outer ends of the cross-bearers, in the type of car

referred to, that is, relatively nearer the free edges of the doors than the hinge edges. Shafts 10 are connected preferably at each end, through means of pulleys 12 and chains 13 winding thereon, with quadrants 14 mounted on shaft 7, so that when shaft 10 is rotating a pull is exerted on quadrants 14 turning shaft 7 and raising arms 8 and through arms 8 raising the doors to closed positions. Bearings 11 are provided with notches or recesses 11^a at their outer ends in which shaft 10 rests when in position for operating shafts 7, but not in door supporting position, these notches or recesses being designed to prevent an inward translation of shaft 10 before the doors are closed. While in these notches or recesses 11^a, shaft 10 merely rotates and exercises a door raising function through the medium of chains 13 and shafts 7. Each of the pulleys 12, located at the end of shaft 10, is provided with a tooth or cam device 12^a adapted to engage a tooth or cam device 11^b on the bearing 11 to lift shaft 10 out of the notch or recess 11^a, after a limited preliminary rotation of the pulley 12, sufficient in extent to turn shaft 7 sufficiently to raise doors 6 to closed positions. After the shaft 10 has been raised in this manner, further winding of the chain 13 on the pulley 12, causes by drawing, a translation of shaft 10 bodily across the free edges of doors 6 to a position beneath the outer or free edges of the doors 6 in which position the shaft 10 relieves the arms 8 of the load-weight or strain on the doors when the car is loaded or the weight of the doors when the car is empty.

The shaft 10 engages doors 6 through the medium of serrated tapered shoes 15 and collars 16, the former being secured to the under side of the forward edges of the doors 6, the latter being rigidly mounted on the shaft 10. Forcing the shaft 10 inwardly, through the slots of the bearing 11, forces the collars 16 against the tapered outer ends of the shoes 15, which has the effect of wedging the doors 6 home or finally adjusting them in their closed positions, in addition to relieving the door raising means from strain.

The amount of chain wound upon the pulleys 12 previous to the engagement of the teeth 11^b and 12^a is equal substantially in length to the amount of chain bearing against the quadrants 14, in the position occupied by the quadrants and shown in dotted lines in Fig. 4 when the doors are in lowered positions. When the shaft leaves the notches or recesses 11^a owing to the fact that the arms 8 are in their uppermost positions, the doors having been closed, further winding of the chain 13 upon the pulleys 12, of course, draws the shaft toward the transverse center of the car. The construction of the several parts embodied in the mech-

anism herein described, of course, may be varied in details so long as they perform the functions for which they are intended. In the drawings I have shown the quadrants, at the center of the car, as inter-engaging so that one quadrant forms a bearing for the other, since there is no relative lateral movement or translation of these quadrants in the operation of a car embodying this mechanism and of the type referred to. Any suitable means may be employed for rotating each of the shafts 10. In the drawings no means has been shown for this purpose but it is understood that a suitable device is to be employed for rotating this shaft. If desired, a quadrant 14 and a pulley 12 may be located at one or more points intermediate the end sill and the longitudinal center of the car on their respective shafts. This structure is illustrated in Fig. 16 where a quadrant 14 and a pulley 12 are shown mounted on shafts passing through both sides of a cross-bearer.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a dump car, a discharge door, a bodily movable and rotatable shaft for first closing said door and then moving into position to hold said door in closed position, a recess in the car underframe for holding said shaft in door closing position and cam means operable upon rotation of said shaft to force the latter out of said recess.
2. In a dump car, the combination with a drop door in the car underframe and a bodily movable shaft connected to a device in engagement with said door to operate the latter, of a shaft retaining recess formed in said underframe, cam means independent of the connection between said shaft and door, operable upon rotation of said shaft to force the latter from said recess to permit bodily translation of said shaft and means for rotating said shaft.
3. In a dump car, the combination with a drop door in the car underframe and a bodily movable shaft connected to a device in engagement with said door to operate the latter, of a shaft retaining recess formed in said underframe, toothed devices independent of the connection between said shaft and door arranged to operate after limited preliminary rotation of said shaft to force the latter from said recess to permit bodily translation of said shaft and means for rotating said shaft.
4. In a dump car, the combination with a drop door in the car underframe and a bodily movable shaft connected to a device in engagement with said door to operate the latter, of a shaft retaining recess formed in said underframe, a projection mounted on said shaft independent of the connection be-

tween said shaft and door and arranged to engage the underframe after limited preliminary rotation of said shaft to remove the latter from said recess to permit bodily translation of said shaft and means for rotating said shaft.

5. In a dump car, having a suitable underframe and a drop door mounted on said underframe, a slotted bearing formed with a shaft retaining recess and a projection adjacent said recess, a bodily movable shaft adapted to rest in said recess and connected to a device in engagement with said door and a projection adapted to rotate with said shaft and after limited preliminary rotation of said shaft to engage the projection on said bearing to force said shaft from said recess to permit bodily translation of said shaft and means for rotating said shaft.

6. In a dump car, the combination with a drop door and a shaft suitably connected with said door to raise the latter, of a quadrant mounted on said shaft and a chain connected to said quadrant and a second shaft adapted to wind said chain to operate first mentioned shaft and raise the door.

7. In a dump car, the combination with a door and a shaft for closing said door connected therewith, of a chain for operating said shaft and a second shaft for operating said chain adapted to move into position to hold said door when in closed position.

8. In a dump car, the combination with a drop door and a shaft for raising said door and suitably connected therewith, of a chain for operating said shaft and a bodily movable shaft for operating said chain and adapted to be moved beneath the outer edges of said door to relieve the first mentioned shaft from load.

9. In a dump car, the combination with a drop door, of a shaft stationarily journaled beneath said door, an arm mounted on said shaft and extending tangentially of the door, a quadrant rigidly mounted on said shaft, a chain for operating said quadrant and a bodily movable shaft for operating said chain and adapted to be moved to a position beneath the free edge of said door to relieve said first mentioned shaft and its connections from load.

10. In a dump car, the combination with a drop door mounted in the car underframe, of a shaft stationarily journaled in the car underframe beneath said door, arms for raising said door rigidly mounted on said shaft, a quadrant for operating said shaft, a chain for operating said quadrant, a bodily movable shaft journaled in the underframe, said underframe having recesses in one portion thereof to receive and retain said bodily movable shaft against movement, said shaft being adapted to operate said chain and adapted to rest in said recesses while

operating said chain to raise the door, means operable upon rotation of said bodily movable shaft for removing the latter from said recesses when the door is closed and suitable connection between said bodily movable shaft and the under side of the door when closed to relieve the stationarily mounted shaft and connections from load-weight when the door is closed.

11. In a dump car, a discharge door, an arm for closing said door, a quadrant for operating said arm, a rotatable bodily movable shaft for first closing said door, then moving into position to hold said door in closed position, a recess for holding said shaft in door closing position, means operable upon rotation of said shaft to force the latter out of said recess and suitable connection between said shaft and arm.

12. In a dump car, a plurality of discharge doors, shafts for raising said doors, a pair of shaft operating devices mounted on said shafts and one of said devices forming a bearing for the other and means for operating said shaft operating devices.

13. In a dump car, a plurality of discharge doors, a plurality of shafts for operating said doors and having adjacent ends, a shaft operating device on each of the adjacent ends of said shafts, one of said devices and its shaft forming a bearing for the other of said devices and its shaft and means for operating said devices independently of each other.

14. In a dump car, a discharge door, a shaft for closing said door and extending beyond the side edge thereof, a quadrant for operating said shaft mounted on said shaft at its end, a bodily movable shaft for supporting said door in closed position and also extending beyond the side edge of said door, a pulley on said shaft at its end and a cable connecting said pulley and quadrant.

15. In a dump car, a plurality of adjacent discharge doors, a pair of aligned shafts for closing said doors, each extending beyond the side edge of its door toward the other, a shaft operating device mounted on the end of each shaft, one of said devices forming a bearing for the other, a pair of shafts for supporting said doors in closed positions, each extending beyond the side edge of its door toward the other, and a connection between each door supporting shaft and its door closing shaft for operating, one by the other.

16. In a dump car, a plurality of discharge doors, a pair of shafts for operating said doors and means on the end of one shaft forming a bearing for the end of the other shaft.

17. In a dump car, the combination with a discharge door, of a shaft for operating said door, a quadrant for operating said

shaft and an arm on said shaft shaped to provide a tangential engagement with said door.

18. Car door mechanism comprising in combination with a door, a lifting shaft, means operated thereby for closing the door, said shaft being movable by said door closing means into supporting position when the door is raised and means independent of

said door closing means for initiating a movement of said shaft into door supporting position.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES A. LINDSTRÖM.

Witnesses:

FRANK E. MILLER,

HARRY CUNNINGHAM.