W. E. MOREY.

DOOR ACTUATING MECHANISM FOR GENERAL SERVICE CARS.

APPLICATION FILED MAY 5, 1913.

1,155,430. Patented Oct. 5, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

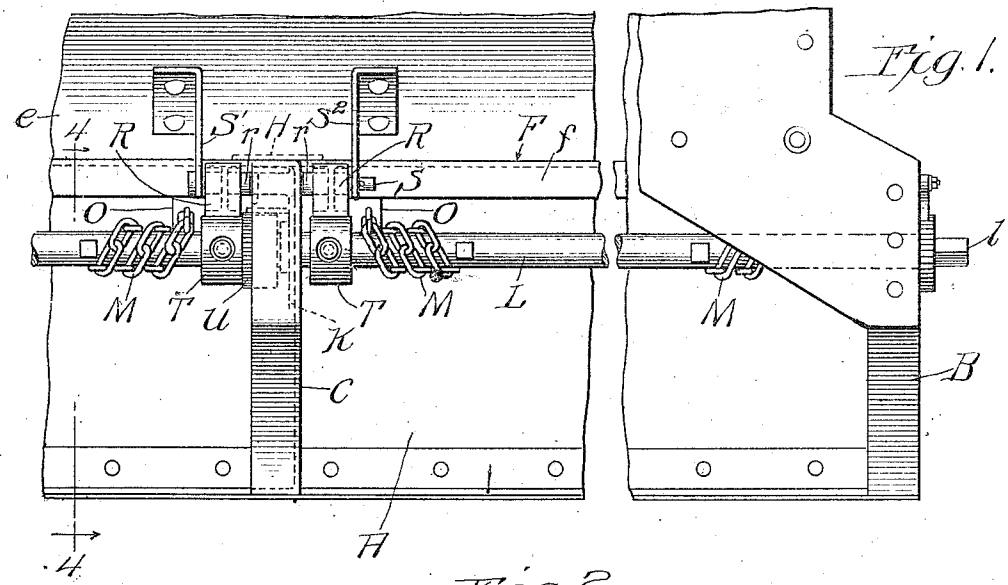
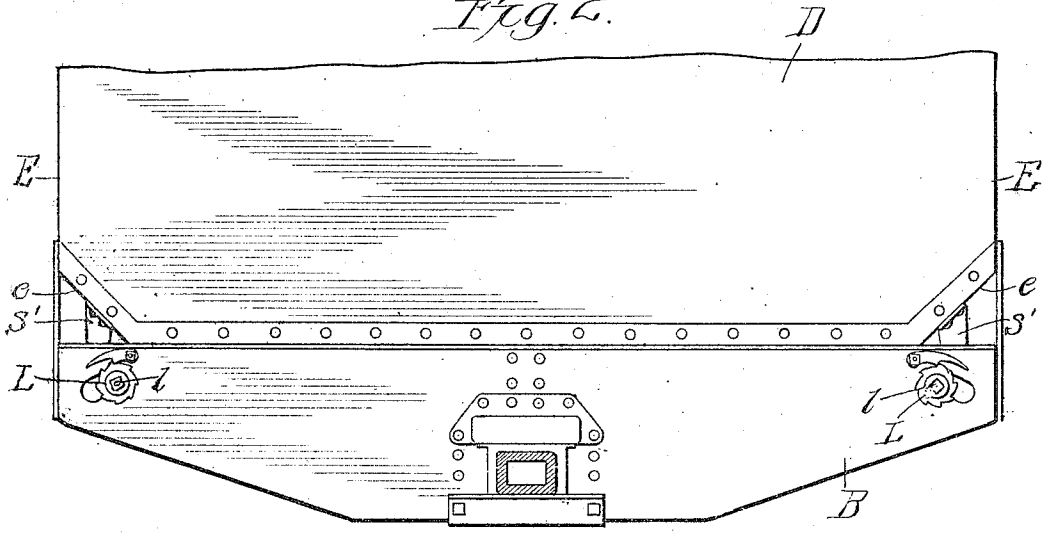



Fig. 2.




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2 SHEETS—SHEET 2.

Fig. 3.

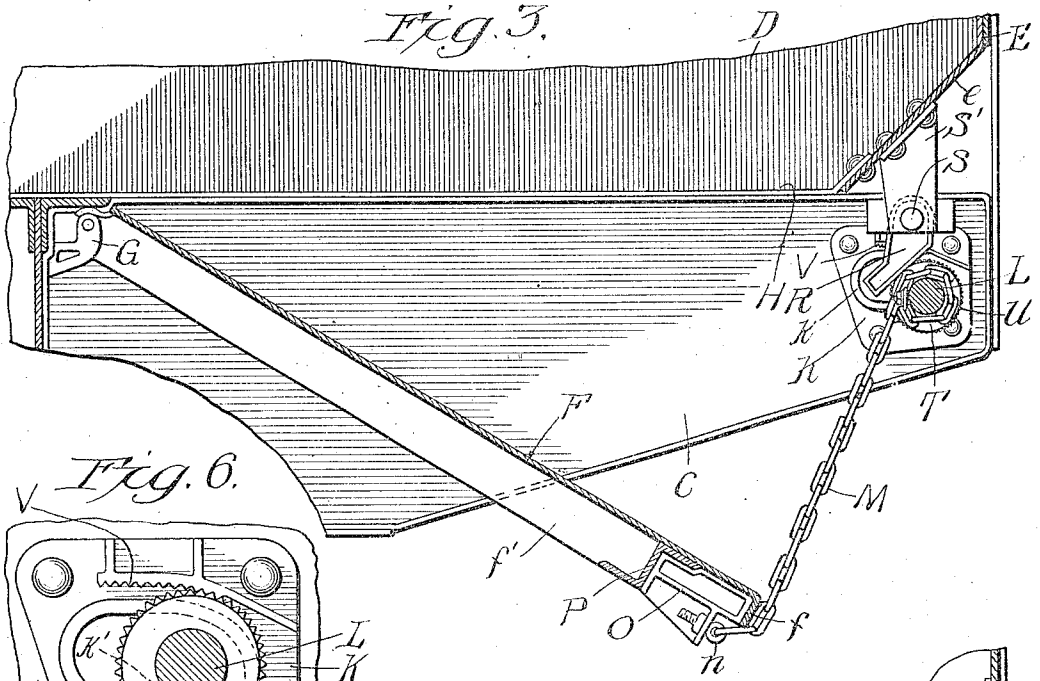



Fig. 6.




Fig. 4.

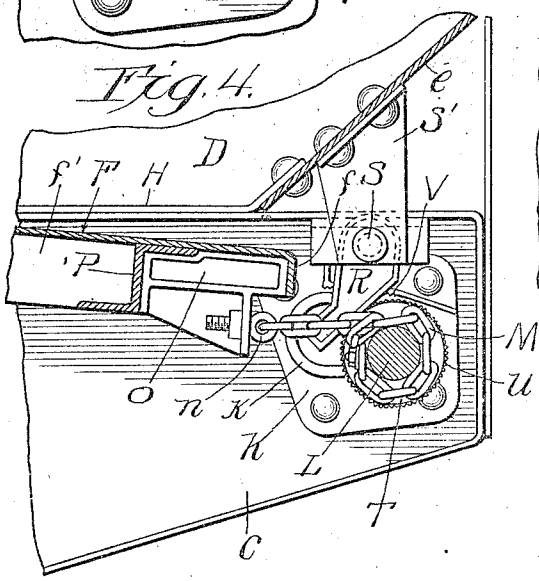
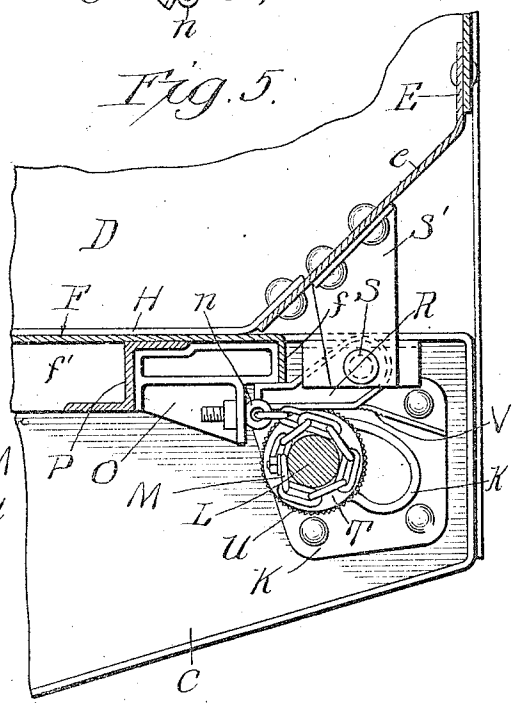



Fig. 5.




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# UNITED STATES PATENT OFFICE.

WILLIAM E. MOREY, OF CHICAGO, ILLINOIS, ASSIGNOR TO NATIONAL DUMP CAR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

## DOOR-ACTUATING MECHANISM FOR GENERAL-SERVICE CARS.

1,155,430. Specification of Letters Patent. Patented Oct. 5, 1915.

Application filed May 5, 1913. Serial No. 765,602.

*To all whom it may concern:*

Be it known that I, WILLIAM E. MOREY, 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-Actuating Mechanism for General-Service Cars, of which the following is a specification.

My invention relates in general to freight cars, and more particularly to door actuating mechanism for freight cars of the type known as "general service" cars.

The practicability of general service cars depends largely upon the efficiency of the mechanism for operating the drop doors which form the principal part of the car floor. It is essential that the operating mechanism should tightly close the doors to prevent leakage of the lading; should securely support the doors in closed position so as to avoid accidental dumping of the lading; and should permit the dropping of the doors to discharge the lading. It is further essential that the door operating mechanism should be strong and durable in construction and at the same time simple in operation.

The object of my invention is to provide an improved operating mechanism for the drop doors of freight cars, which will possess the desirable characteristics above referred to.

My invention will be more fully disclosed hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in a convenient and practical form, and in which—

Figure 1 is a side elevational view of a portion of one end of a freight car, parts thereof being broken away; Fig. 2, an end elevational view looking from the right in Fig. 1 on a smaller scale; Fig. 3, an enlarged cross sectional view showing a door in open position; Fig. 4, a detail view showing the door in the position to which it is raised by the winding of the chains on the shaft; Fig. 5, a view similar to Fig. 4, showing the door completely closed; and Fig. 6, a detail elevational view of one of the shaft supporting plates.

The same reference characters are used to designate the same parts in the several figures of the drawings.

Reference letter A indicates the center sill, which may be of any suitable construction, such, for instance, as of the "box girder" type.

B indicates the front sill of the car, and C one of the cross bearers or transverse members of the underframe.

D designates one of the end walls of the car, and E one of the side walls.

F indicates one of the drop doors which is pivotally supported by hinges G upon the center sill. The door F is adapted to be swung upwardly about its inner edge into a closed position flush with the plane of the floor of the car, or to be swung downwardly, to the position shown in Fig. 3.

H designates a fixed floor strip which overlies the transverse underframe member C and projects on the opposite sides thereof so as to form stops against which the adjacent side edges of the adjacent doors engage when closed.

A car of the construction above described is one well-known and does not in itself embody my invention, but is merely illustrated and described in order that the construction and operation of my improved door actuating mechanism may be fully disclosed. It will be obvious that my invention may be applied to cars of other specific constructions than that above described.

Secured to the outer end of each of the transverse members C of the underframe is a bearing plate K having formed therein a slot bounded by a flange *k*. The outer end of the slot is depressed so as to form a shoulder *k'* between the lower surface of such depressed portion and the lower wall of the remaining portion of the slot, as clearly shown in Fig. 6.

L designates a rotary shaft extending through the slots in the bearing plates K.

M designates chains connecting the shaft L with the free, or swinging, edge of the door F. Two chains are preferably provided for each door F, the shaft L preferably extending one-half the length of the car and adapted to operate a plurality of doors, such as F. The ends of the chain M are preferably secured to the doors through the medium of eye-bolts *n*, each of which is carried by a block O rigidly secured beneath the door adjacent its swinging edge. As shown in Fig. 3, each block O fits between the flange *f* depending from the swinging edge of the door and a Z-beam P which extends transversely of the door and serves to

strengthen the same. Each block O also preferably fits against the adjacent side flange $f'$ of the door.

R designates a pivoted latch, one of such latches being provided for supporting each side of each of the drop doors F. The latches R on the opposite sides of each transverse underframe member C may be conveniently supported, as shown in Fig. 1.

S′, S² designate brackets which are secured to and depend from the inwardly inclined portion $e$ of the car side E. A rod S is supported by the lower ends of the brackets S′ and S², and upon said rod are pivotally supported the upper ends of the latches R. In order to afford a more secure support for the rod S, a bracket $s$ is secured within the upper flange of the transverse underframe member through which the rod passes. Spacing collars $r$ preferably surround the rod S and are interposed between the latches R, R and the adjacent surfaces of the bracket $s$ and transverse underframe member C.

Secured to the shaft L in the planes of the latches R are collars T which are adapted to engage the latches and swing them beneath the outer edges of the doors when the shaft bodily moves inwardly, in a manner which will be more fully hereinafter described.

Fixed to the shaft L adjacent each bearing plate K is a toothed collar U which is adapted to engage with a toothed rack V carried by and preferably formed integral with the plate K.

The operation of my improved door actuating mechanism is as follows: When the door is in the open position shown in Fig. 3, and it is desired to close the same, a suitable lever is applied to the squared end $l$ which projects beyond the end sill B of the car underframe. The shaft L is thereby rotated in a direction to wind the chains N thereon. When the rotation of the shaft L has, through the winding of the chains thereon, lifted the door F to the position shown in Fig. 4, a further rotation of the shaft will cause it to move bodily inwardly, thereby swinging the latches R into the door supporting position shown in Fig. 5, in which they underlie the outer edges of the door, and preferably engage beneath the outer portions of the respective blocks O. The swinging of the latches into door supporting position is effected through the engagement with them of the collars T on the shaft L. The inward movement of the shaft L is effected not only by the winding of the chain thereon but also through the engagement of the teeth on the collars U with the teeth on the respective overlying racks V.

It will be observed that during the rotation of the shaft L in lifting the doors from the position shown in Fig. 3 to that shown in Fig. 4, it is supported in the depressed outer portions of the slots in the several brackets K through which it extends. The further rotation of the shaft L after the parts have assumed the position shown in Fig. 4 effects the inward movement of the shaft and coincidentally causes it to rise from the depressed portion of the slots through which it extends, into the portions of the slots which are at a higher level. This inward and upward movement of the shaft causes the latches R to wedge the doors tightly closed and to securely retain them in closed position, owing to the direct support afforded to the latches by the underlying shaft.

When it is desired to allow the doors to drop to discharge the lading, the shaft L is rotated in a direction to unwind the chains therefrom. The engagement of the teeth on the collars U with the teeth on the overlying fixed racks V causes the shaft to move outwardly within the surrounding slots in the plates K, and to rest within the depressed outer portions of such slots. This outward lateral movement of the shaft permits the several latches to swing downwardly from the position shown in Fig. 5 to that shown in Fig. 4, thereby permitting the free edge of the door to pass such latches and to fall to the full open position shown in Fig. 3.

From the foregoing description it will be observed that I have invented an improved door actuating mechanism for the drop doors of freight cars, which will not only close the doors but will wedge them tightly closed and securely support them in closed position. It will be further observed that my improved door operating mechanism is exceedingly simple in operation, as it involves merely the rotation of a single shaft in one direction to effect the closing and locking in closed position of the doors, and a rotation in an opposite direction to unlock the doors, and permit them to drop to open position.

What I claim is:

1. In combination with a car having a drop door, a rotatable shaft, a chain or the like operatively connecting said shaft and said door whereby rotation of the former will operate to close the latter, a latch member pivoted adjacent said shaft, the latter being operable during closing of said door to move said member beneath said door, and means to positively effect said last-named operation of said shaft, said means comprising a rack, said shaft being provided with a pinion member arranged to mesh and coact with said rack.

2. In a freight car, the combination with an underframe comprising longitudinal and transverse members, of a floor comprising drop doors, a rotary and bodily movable shaft supported by the underframe, chains

operatively connecting said shaft and doors to close the doors upon the rotation of the shaft, toothed collars fixed upon said shaft, stationary racks with which said collars engage to effect a bodily movement of said shaft longitudinally of the doors, and members actuated by the bodily movement of said shaft to support the doors in closed position.

3. In a freight car, the combination with an underframe comprising longitudinal and transverse members, of a floor comprising drop doors therein, a rotary and bodily movable shaft extending transversely of the path of movement of the doors, chains operatively connecting said shaft and doors to close the doors when the shaft is rotated, toothed collars fixed to said shaft, stationary racks with which said collars engage to effect a bodily movement of the shaft longitudinally of the doors, and pivoted latches depending into the path of movement of said shaft and actuated thereby to support the doors in closed position.

4. In a freight car, the combination with an underframe comprising longitudinal and transverse members of a floor comprising drop doors therein, a rotary and bodily movable shaft extending through elongated openings in the ends of the transverse members of the underframe, chains operatively connecting said shaft with the doors to lift the doors upon the rotation of the shaft in one direction and to permit them to drop upon the rotation of the shaft in the opposite direction, toothed collars fixed to said shaft, racks secured to the transverse members of the underframe above the slots therein through which such shaft extends, and pivoted latches depending into the path of said shaft, whereby the rotation of said shaft will wind said chains thereon and lift said shaft in position for the collars thereon to engage said racks and thereby bodily move said shaft toward the doors and swing said latches into position to support the doors.

In testimony whereof, I have subscribed my name.

WILLIAM E. MOREY.

Witnesses:
HENRY A. PARKS,
ANNA L. WALTON.