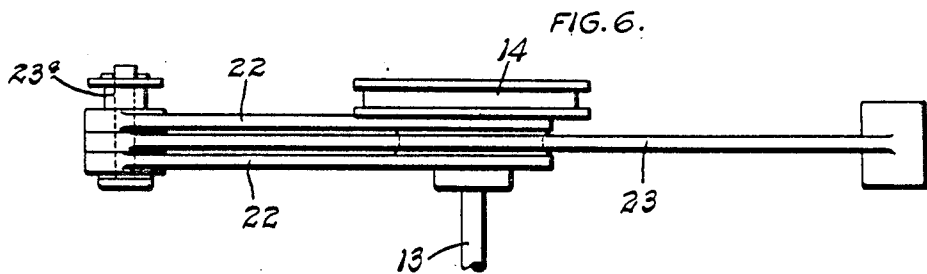
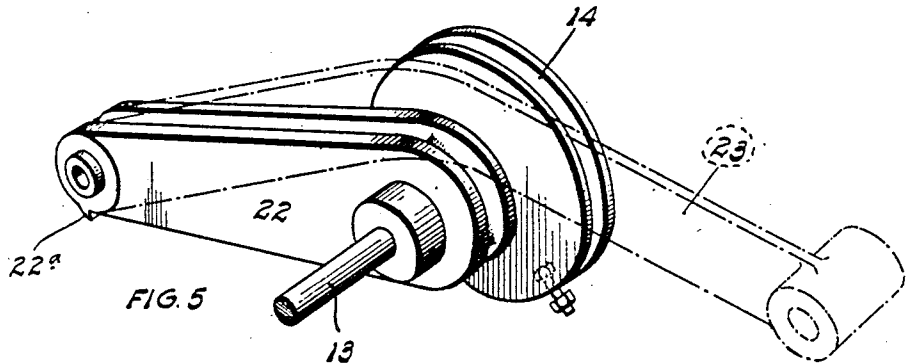
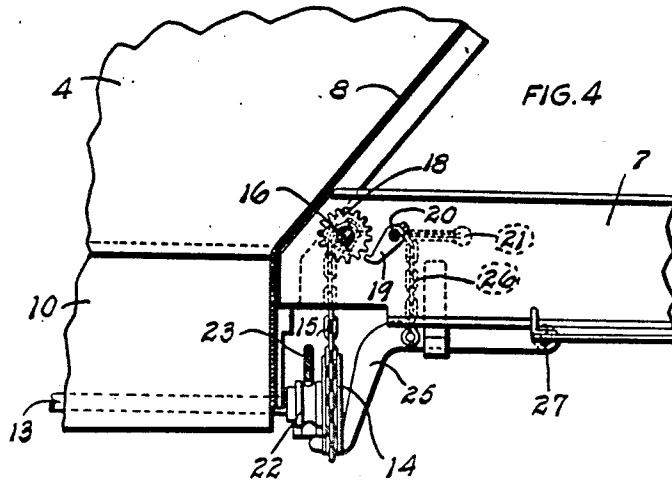


G. C. CHERBONNIER.
CAR DOOR OPERATING MECHANISM.
APPLICATION FILED JAN. 29, 1912.

1,054,674.

Patented Mar. 4, 1913.

2 SHEETS-SHEET 2.



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CAR-DOOR-OPERATING MECHANISM.

1,054,674.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Application filed January 29, 1912. Serial No. 874,066.

To all whom it may concern:

Be it known that I, GEORGE C. CHERBONNIER, a citizen of the United States, residing at Ferguson, St. Louis county, State of Missouri, have invented a certain new and useful Improvement in Car-Door-Operating Mechanism, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a fragmental plan view of the underframing of a car showing my improved door operating mechanism mounted thereon. Fig. 2 is a fragmental vertical section view through the car illustrating my improved door operating mechanism. Fig. 3 is a similar view showing the parts in a changed position. Fig. 4 is a longitudinal vertical section view through a fragmental portion of the car illustrating part of my improved door operating mechanism. Fig. 5 is a detailed view illustrating part of the door operating mechanism. Fig. 6 is a plan view of the parts of the mechanism seen in Fig. 5.

This invention relates to a new and useful operating mechanism designed particularly for use in connection with the doors of hopper bottom cars and which doors are equipped with a mechanism employing levers commonly known as jack-knife levers. The principal object of my invention is to simultaneously actuate both doors from a single shaft that can be operated from either side of the car and the operating mechanism serves as a lock to hold the doors in their closed position. The doors are pivotally swung from opposite sides of the car and are designed to close against each other at their free edges, thus dispensing with the use of a frame member in the hopper whereby a clear opening is provided for the discharge of the load.

As shown in Fig. 1 the center sill members of the underframing are interrupted by the hopper opening, said members terminating at the end walls of the hopper, thus permitting the contents to be dis-

charged through the hopper opening without interference. This is of special advantage in cars loaded with ore, coal, etc., where the contents are apt to freeze in winter due to rain or snow percolating therethrough.

In the drawings 1 indicates the intermediate sills of the underframe and 2 the side sills, which side and intermediate sills 1 are connected by means of diaphragms 3.

4 are inclined side sheets of the car which are connected by bracket 5 and angle sheets 6 to the intermediate sills 1.

7 are the draft sills which are supported at their inner ends by cross bearing members connected to the side sills.

8 indicates the end walls of the hopper which are located adjacent the inner ends of the draft sills.

9 is a hinge bracket riveted to the intermediate sills to which are hinged the outer ends of the hopper doors 10. The inner edges of these doors are preferably flanged downwardly as shown and are designed to close against each other and be locked in such closed position.

11 indicates a Z-shaped reinforcing member secured to each door near its closing edge and 12 are strengthening members attached to the door and to said Z-shaped reinforcing members.

Suitable bearings are secured to the edges of one of the doors in which is mounted a shaft 13, said shaft extending beyond the door at each end and provided with a chain wheel 14. On this chain wheel 14 is secured a chain 15 by means of a suitable bolt or fastening device shown, said chain passing upwardly and being wound around a shaft 16 extending from side to side of the car with hand wheels 17 at each end. Near one of the draft sills, this shaft is provided with a ratchet 18 with which coöperates a pawl 19, said pawl being mounted upon a rod 20 extending from side to side of the car and having weighted handles 21, whereby the pawl is normally held by the gravity of these handles in operative relation to the ratchet wheel.

22 indicates a rock arm fixed to the shaft 13 and conjoined to the chain wheel 14, whereby when the shaft 13 is rotated, the

rock arm 22 will be carried with it. This rock arm is preferably formed in a single piece and comprises a head provided with a pair of legs or arms between the free ends of which is pivotally mounted one end of a link 23, said link being pivotally connected at its opposite end to the free edge of the opposite door as designated by 24. The link 23 is preferably bent as shown so that when the doors are closed the line of centers of the toggle comprising the pivotal points of the rock arm 22 and the link 23 will be past "dead centers" as it is called so as to lock the doors in their closed position.

25 indicates a lever pivoted at 27 and having an extension arranged under the end of the lever 22 in its closed position, said lever 22 being provided with a projection 22^a to prevent the lever 25 from slipping out of position. This lever 25 is connected by a chain 26 to the pawl operating rod 20 so that as this rod is operated to release the ratchet wheel 18, the chain 26 will be slightly wound on the rod 20 lifting the lever 25 and elevating the rock arm 22 so as to break the dead centers of the toggle and permit the doors to swing downwardly by gravity.

The open position of the doors is shown in Fig. 3 and, if desired, the pin 23^a which forms the pivotal connection between the rock arm 22 and the link 23 may be extended so as to catch the chain as the doors move to their open position, or said pin may be shortened, if desired, in which event the chain will extend from the chain wheel 14 direct to its winding shaft 16. (See dotted line *a* Fig. 3.) To close the doors one of the hand wheels 17 is rotated so as to wind the chain 15 on the shaft 16, this winding action rotating the chain wheel 14 and swinging the rock arm 22 about the pivot 23^a as the door rises until it reaches the position shown in Fig. 2. In this movement of the rock arm 22, the link 23 being connected thereto, will move the companion door to its closed position and when the doors are closed, the pin 23^a will drop past the line of centers of the shaft 13 and the pivotal point 24 of the link 23 so as to lock the doors closed. In their movement, the rock arm 22 and the link 23 connected thereto will swing over the lower end of the initial releasing lever 25 and engage it with the projection 22^a.

It will be readily understood that the jack knife levers 22 and 23 are arranged at each end of the hopper, being connected and operated by the shaft 13 which extends throughout the length of the door on which it is mounted, but my improved operating mechanism comprising the sheave, or chain wheel 14, the winding chain, the hand wheels and release mechanism is arranged

at one end only of said hopper. Hence the door-operating mechanism at each end of the car can be operated by one man.

It will be readily understood that minor changes in the size, form and construction of the various parts of my improved car door operating mechanism can be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

What I claim is:

1. The combination with oppositely moving doors for closing the opening in a hopper car, of door-operating mechanism including a pair of jack knife levers connected to both of the doors for locking them in their closed position and means for swinging the levers to open the doors, and means including a lever adapted to engage against the connected ends of the jack knife levers for initially moving said jack knife levers from their locked position prior to the operation of the means for swinging the levers to open the doors.

2. The combination of a pair of doors for closing the opening of a hopper bottom car, means arranged at the ends of said doors and connected to each of them for locking them in their closed position, a winding shaft, a flexible connection between said shaft and said doors whereby said doors are moved to their closed position and locked, and means independent of said winding shaft for initially operating said doors in their opening movement.

3. In a car door operating mechanism, the combination of a pivoted door, a shaft carried at the free edge of said door, a chain wheel on said shaft, a chain connected to said wheel, a winding shaft for said chain, means for preventing retrograde movement of said winding shaft, a rock arm movable with said chain wheel and a link cooperating with the outer end of said rock arm.

4. In a car door operating mechanism, the combination of a pivoted door, a rock arm mounted near the free edge of said door, and means for operating said rock arm, a link connected to the outer end of said rock arm and a companion door to which the opposite end of said link is connected, and separately operable means for operating the outer end of said rock arm to initially move the doors to their open position.

5. In a car door operating mechanism, the combination of two companion doors movable in opposite directions, a rock arm mounted on one of said doors, a link connecting the outer end of said arm with the companion door, operating means for moving said parts to a position where the doors are closed, locking means for securing said operating means in adjusted position, and

means for simultaneously releasing said operating means and initially moving said doors toward an open position.

6. A car having downwardly opening doors adapted to swing toward or away from each other to close or open respectively, an operating shaft mounted on the car frame, means mounted on the oppositely disposed doors and independent of the car frame whereby the doors are locked in closed position independently of the shaft, and a connection between the shaft and said means whereby the latter are actuated and the doors operated, and means independent of the shaft for initially operating said means.

7. Operating mechanism for the doors of a hopper car whose free ends abut against each other when they are in closed position, comprising a rotatable shaft, means connected to oppositely disposed doors and so arranged that a portion of said means will move to one side of the point of connection between said means and one of the doors and into substantially the same horizontal plane as the point of connection between the means and the doors, thereby locking the doors in closed position, a yielding connection between said shaft and said means for drawing the latter into said locking position, and means operable independently of said shaft for moving said means out of locking position.

8. Operating mechanism for the doors of a hopper car adapted to swing toward or away from each other to close or open, respectively, comprising means carried by and connecting oppositely disposed doors, said means being so arranged that when a portion thereof is moved to one side of the abutting or free ends of the door the latter will be locked in closed position, a rotatable shaft, and a yielding connection between said means and the shaft whereby the means are actuated and the doors brought into closed position, and means operable independently of the shaft for moving said means prior to operation of the shaft to release the doors.

9. Operating mechanism for the downwardly swinging and oppositely disposed doors of a car, comprising mechanism pivotally secured to oppositely swinging doors, independent of the frame of the car arranged to swing to one side of the longitudinal center of the car when the doors are being closed whereby the doors are locked and the pulling tendency of the doors exerted on each other through said mechanism, and a rotatable shaft having operative relation with said mechanism whereby the position of the latter is controlled and the doors operated, securing means for the shaft, and means operable thereby for operating the said mechanism.

10. Operating mechanism for the downwardly swinging doors of a hopper car, comprising a pivoted member secured to each door, the members of oppositely disposed doors being connected together and so arranged that the point of connection between said members will be moved to one side of the pivotal point on the doors and in substantially the same horizontal plane whereby the doors are held in closed position independently of the car frame, means operatively connected with said members to control the position of said members and the doors, locking means for said means, and means operable with said locking means for initially actuating said members.

11. A car having gravity opening doors swinging in opposite directions, means pivotally secured to oppositely disposed doors, a point in said means intermediate of the ends being adapted to swing transversely of the car to either side of the pivotal connection of said means with one of the doors, the doors being held in closed position by said means when said intermediate point is swung transversely away from the longitudinal car center, mechanism having operative connection with said means whereby the position of said intermediate point is controlled, and locking means for said mechanism operatively connected to a means for initially moving said point toward the car center.

12. A car provided with downwardly opening doors arranged to swing toward and away from each other to close and open, respectively, means carried by the doors whereby the latter are automatically locked in closed position, said means being so related to the doors when the latter are in closed position, that the oppositely disposed doors will exert a pulling tendency on each other through said means, means carried by the car frame having a yielding connection with the doors and with said first mentioned means whereby the doors are moved to closed position and the first mentioned means moved into locking position, and means operated independently of said last mentioned means for moving said first mentioned means out of locking position.

13. A car provided with downwardly opening doors arranged to swing toward and away from each other to close and open, respectively, link mechanism carried by the oppositely disposed doors whereby the position of the latter may be controlled, said link mechanism being so related to the doors when the latter are in closed position, that a pulling tendency will be exerted by the doors on each other through said mechanism, means carried by the car frame and operatively connected with the link mechanism whereby the connections between the links and the doors may be brought into sub-

stantially the same horizontal plane and
thereby lock the doors in closed position,
and means operable independently of said
first mentioned means adapted to engage
5 with said link mechanism to move the link
connections out of said plane and allow the
doors to open.

In testimony whereof I hereunto affix my
signature in the presence of two witnesses,
this 26th day of January, 1912.

GEORGE C. CHERBONNIER.

Witnesses:

OSCAR HOCHBERG,
JAMES J. COOPER.

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