

Feb. 7, 1928.

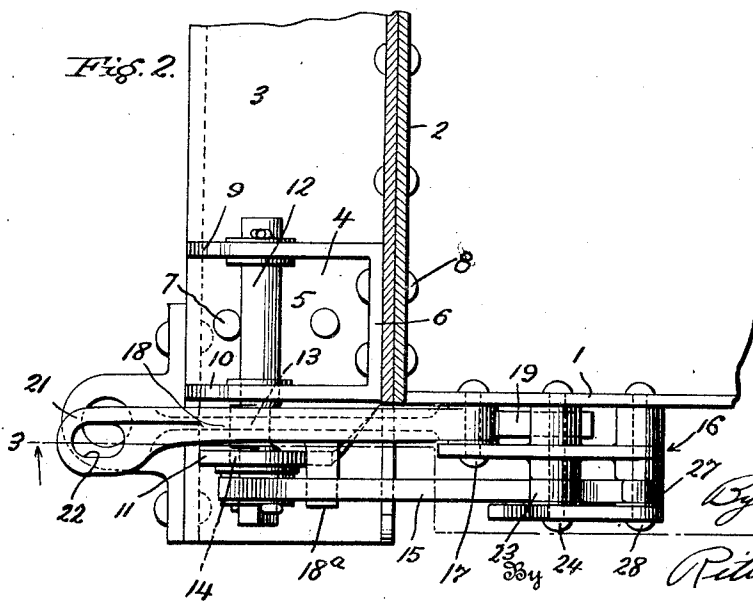
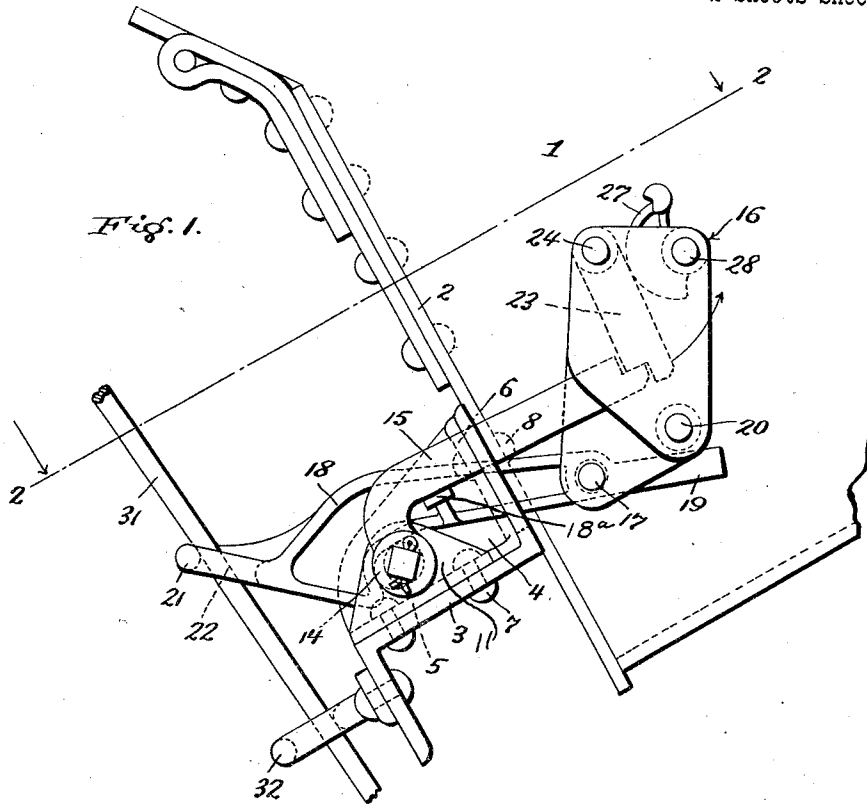
1,658,600

B. W. KADEL

CAR DOOR LOCK

Filed Dec. 19, 1924

2 Sheets-Sheet 1



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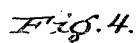
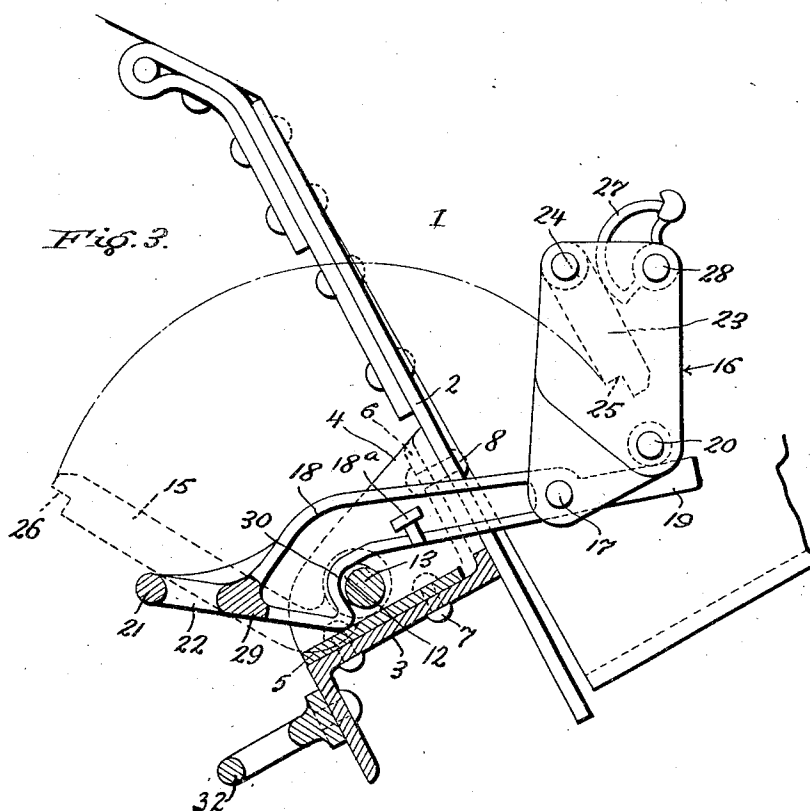
B. W. KADEL

1,658,600

CAR DOOR LOCK

Filed Dec. 19, 1924

2. Sheets-Sheet 2



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Patented Feb. 7, 1928.

1,658,600

UNITED STATES PATENT OFFICE.

BYERS W. KADEL, OF BALTIMORE, MARYLAND.

CAR-DOOR LOCK.

Application filed December 19, 1924. Serial No. 756,917.

The invention relates to hopper car door securing devices and has particular reference to securing or locking means well adapted for use in connection with the doors of a twin or other hopper car.

The object of the invention, generally stated, is to provide means on the car body for preventing undesired rotation of a shaft carried by the door, the shaft forming part of a door locking mechanism.

Another object of the invention is the provision of a door locking mechanism including a hook carried by the car body cooperating with eccentric means carried by the door, the eccentric means being rotatable to move the door from partly to fully closed position, the mechanism further including locking means for the eccentric means whereby unintentional or casual rotation will be positively prevented.

A further object of the invention is to provide a hopper door locking mechanism including a rockable or rotatable eccentric member or element carried by the door and cooperating with a pivoted hook carried by the car body, the eccentric member acting to retain the door in partly or fully closed position and to move the door from partly into fully closed position and being provided with an actuating member with which cooperates retaining means on the car body whereby undesired rotation will be prevented, the actuating means for the eccentric member cooperating with the hook for locking or holding the latter likewise against movement.

Still another object of the invention is to provide in combination with a pivoted hook member and a projecting door arm or spreader, of means carried by said hook and spreader for cooperating with a pry-bar whereby the door may be forced from partially closed to fully closed position.

And still another object of the invention is to provide in combination with a flanged spreader bar, of a bracket member secured thereto, said bracket member carrying lock cooperating means and being adapted to reinforce the spreader or door arm against distortion.

To these and other ends the invention comprises the various elements and combinations of elements to be hereinafter described and set forth in the appended claims.

In the drawings:

Figure 1 is a side elevation of a hopper

car door equipped with my locking device, the door being in fully closed position and all of the operative parts being in interlocked relation.

Figure 2 is a section on the line 2—2 of Figure 1, showing a plan view of the locking device.

Figure 3 is a section on substantially the line 3—3 of Figure 2, showing the door in partly closed position with the locking features released or in inoperative position.

Figure 4 is a detail view of the eccentric member.

Throughout the specification and drawings like parts are designated by like reference characters.

Referring more particularly to the drawings, the numeral 1 designates a car hopper which is normally closed by a suitably hinged door 2 capable of swinging downwardly into open position. Secured to and extending transversely of the door 2 is a spreader or door arm 3 which may conveniently be formed as a Z-bar and which projects beyond the side of the door for cooperation with retaining means to be described. It should be stated at this point that the mechanism is intended to be applied at each side of the hopper, though it is shown at only one side inasmuch as the other is a mere duplication.

Carried by the door arm or spreader 3 is a bracket designated generally by the numeral 4, which bracket includes portions 5 and 6 extending at an angle to each other and riveted or otherwise secured, as at 7 and 8, to the outstanding flange and door engaging flange respectively of the Z-bar spreader. The bracket 4 is shown as having a plurality of web portions 9, 10 and 11 so as to form a support or bearing for a shaft 12 formed with a crank, eccentric or cam portion 13. The shaft might be a single one, extending throughout the length of the spreader or entirely across the hopper or a separate short shaft may be provided at each end of the spreader, as shown. Certain of the webs are formed with elongated slots 14 to permit the insertion of the shaft by accommodating the crank portion 13 thereof, while the other webs may be provided simply with circular openings. The number of webs slotted depends on whether a single shaft or a pair is used. The provision of the elongated slots is possible owing to the fact that in actual use the strain upon the

shaft is such that it is maintained always at one end of the slots. This shaft is of course intended to be restrained from longitudinal movement by any desired means whatsoever and at one end it carries a lever 15 here represented as of substantially L-shape, though naturally there is no limitation in this respect. The lever may be integral with the shaft or suitably secured thereto, removably or otherwise.

Suitably mounted upon the side of the car hopper 1 is a bracket structure indicated generally at 16, within which is pivoted, at 17, a hook 18 located in such position as to extend between the webs 10 and 11 of the bracket structure 4 and to engage the crank or eccentric portion 13 of the shaft. Swinging movement of this hook in one direction is limited owing to the provision of an extension 19 thereon engageable with a stop 20 forming a part of the bracket structure 16. The other end of the hook is formed with an extension 21 having an opening 22 therein for a purpose to be described. This hook constitutes the means cooperating with the shaft 12 for holding the door in its closed position. On one side of the hook 18 is a small lug or shelf 18^a located in such position as to be engaged by the lever 15 when the door is in its fully closed position, as indicated in Figure 1.

In order that the hook 18 and lever 15, and consequently the shaft 12, may be held against undesired movement, I may provide holding means including a latch 23 pivoted at 24 within the bracket structure 16 and having a shouldered end 25 engageable with an extension 26 on the lever 15. It is intended that the latch 23 be held in its locked position with respect to the lever 15 by means of a locking cam 27 pivoted at 28 within the bracket.

In the operation, it will be seen that when the door is closed and locked, the hook 18 is in engagement with the crank or eccentric portion 13 of the shaft 12 and the lever 15 is in engagement with the latch 23 which is in turn held in its operative position by the locking cam 27. When it is desired to open the door, it is first necessary to swing back the locking cam 27 so that the latch 24 may be swung in the direction of the arrow out of obstructing relation to the extension 26 on the lever 15. The lever is then swung away from the hopper, of course out of engagement with the shelf or lug 18^a on the hook, permitting the hook to be lifted out of engagement with the shaft 12, thus releasing the door. After the door is opened, the hook 18 is retained in the same position, shown in Figures 1 and 3, owing to the engagement of the extension 19 with the stop 20, so that the inclined surface 29 at its free end will be in position to be engaged by the shaft 12 upon subsequent closing of the door,

the hook being consequently lifted until the shaft passes from under the inclined surface and engages the ledge 30. It is a simple matter to move the door, by hand, into this partly closed position. At such a time it will be observed that the hook 18 rests against the portion 5 of the bracket and that the heel of the lever rests against the spreader 3.

To effect full closing of the door, the lever 15 may be grasped and swung toward the hopper from the position shown in Figure 3, whereupon the crank or eccentric 13 will come into engagement with the ledge 30 of the hook and consequently force the door to its seat. In some instances it may be difficult, owing to the distortion of the door, to effect closure thereof by this means, and under these circumstances use may be made of a pry-bar indicated at 31, which pry-bar may conveniently be inserted through the opening 22 and through a guide eye or the like 32 secured to the spreader. When the outer end of the pry-bar is thus swung downwardly the door will be forced to its seat. If this means be employed for completely closing the door it is intended that the lever 15 be then swung over to bring the crank 13 in engagement with the hook ledge and to bring the lever into such position that the latch 23 may be engaged therewith and locked by means of the cam 27. With the parts in fully locked position, the cam 27 will hold the latch 23 in place, the latch 23 will positively prevent outward swinging movement of the lever 15, and the engagement of the lever with the locking shelf 18^a will positively prevent movement of the hook 18 in one direction, movement in the other direction being prevented by the engagement of the extension 19 with the stop 20. As a consequence all of the parts are effectively and adequately interlocked and unintentional or accidental dislocation or derangement absolutely prevented.

While I have shown and described the preferred embodiment of the invention including certain mechanical details and a specific arrangement, it should be understood that this disclosure is for illustrative purposes only inasmuch as the right is reserved to make all such changes in the form, construction and arrangement of parts as will widen the field of utility and adaptability of the invention provided such variations and modifications constitute no departure from the spirit of the invention or the scope of the claims hereunto appended.

Having now described my invention, what I claim as new and desire to secure by Letters-Patent, is:

1. In a railway car having a door, a shaft rotatably mounted on the door, the said shaft being provided with an eccentric portion, a latching member pivoted upon the

car body and adapted to engage the eccentric portion of the shaft to support the door, and means mounted on the car body directly co-operable with the shaft for locking it against

rotative movement.

2. A railway car having a door, a shaft rotatably mounted on the door, a hook-shaped member pivoted upon the car body and adapted to engage the said shaft to hold the door shut, the said hook-shaped member and the shaft being so formed and arranged that when the shaft is in one position of rotation the door will be held in a different position of closure from when in another position of rotation, and means mounted upon the car body adapted to contact with a portion of the shaft to hold the shaft against undesired rotation.

3. A railway car having a door, a shaft rotatably mounted on the door, a latch pivoted upon the car body adapted to engage the said shaft to support the door, the shaft and latch being cooperatively formed in such manner that when the shaft is in one position of rotation the door will be held by the latch in a partly closed position and when in another position of rotation the door will be held in a more fully closed position, an arm carried by the shaft for effecting rotation of the same, and means movably mounted on the car body adapted to engage the arm to prevent undesired rotation of the shaft.

4. A railway car having a door, a shaft rotatably mounted on the door, a latch pivoted upon the car body adapted to engage the said shaft to support the door, the shaft and latch being cooperatively formed in such manner that when the shaft is in one position of rotation the door will be held by the latch in a partly closed position and when in another position of rotation the door will be held in a more fully closed position, means carried by the shaft for effecting rotation thereof, and means cooperating between the last mentioned means and the latch for preventing disengagement of the latch and shaft when the shaft is in the said position of rotation to hold the door in the said more fully closed position.

5. A railway car having a door, a shaft rotatably mounted on the door, a latch pivoted upon the car body adapted to engage the said shaft to support the door, the shaft and latch being cooperatively formed in such manner that when the shaft is in one position of rotation the door will be held by the latch in partly closed position and when in another position of rotation the door will be held in fully closed position, and an arm mounted on the shaft arranged to cooperate with the latch when the door is supported in fully closed position in a manner to lock the hook against pivotal movement out of engagement with the shaft.

6. A railway car having a door, a shaft rotatably mounted on the door, a latch pivoted upon the car body adapted to engage the said shaft to support the door, the shaft and latch being cooperatively formed in such manner that when the shaft is in one position of rotation the door will be held by the latch in a partly closed position and when in another position of rotation the door will be held in a more fully closed position, the shaft being provided with an arm arranged to overlie a portion of the latch when the door is in said more fully closed position in a manner to lock the hook against pivotal movement out of engagement with the shaft, said arm being arranged to overlie the side of the car when the door is in said more fully closed position, and means pivoted upon the car body adapted to contact the arm to prevent undesired rotation of the shaft.

7. A railway car having a door, a door-supporting latch pivoted upon the car body adapted to engage a portion of the door to hold the same shut, and a shelf carried by and extending outwardly at one side of the latch adapted to contact with means carried by the door for locking the latch in engagement with the door.

8. A railway car having a door, a door-supporting latch pivoted upon the car body adapted to engage a portion of the door to hold the same shut, the said latch being provided with an abutment, the door carrying a member movably mounted thereupon, said movable member being arranged to cooperate with said abutment to prevent pivotal movement of the latch when the door is supported thereby, and means for locking said movable member against undesired movement.

9. A railway car having a door, a door-supporting latch pivoted upon the car body adapted to engage a portion of the door to hold the same shut, said latch having a door-engaging ledge and an approach portion, the latter being arranged in advance of the ledge, and a prying aperture formed in the plane of the approach portion of the latch, the same lying substantially at right angles to the plane of the ledge of the latch.

10. A railway car having a door supplied with a stiffening member formed of an angular section with one leg thereof outstanding from the door, a shaft rotatably associated with the door, means carried upon the car body for engaging the shaft to hold the door shut, and a bearing for the shaft, the same being secured to the door and embodying a brace adapted to connect and tie the outstanding leg of the stiffening member to the door.

11. A railway car having a door, a shaft rotatably mounted thereon, means carried by the car body adapted to engage the shaft

to hold the door shut, the shaft being provided with an eccentric portion arranged for engaging cooperation with the said means carried by the car body, and a bearing for the shaft, the same having an elongated shaft aperture adapted to permit the entry of the eccentric portion of the shaft.

12. A railway car having a door, a stiffening member mounted upon the door, a shaft rotatably mounted on the stiffening member, the said shaft having an eccentric portion formed thereon, a latch pivoted upon the car body and adapted to engage the eccentric portion of the shaft to hold the door in different positions of closure as the shaft is rotated, and an arm mounted upon the shaft, the said arm comprising means for effecting rotation of the shaft and arranged to overlie the side of the car when the door is fully closed, and means mounted upon the side of the car adapted to cooperate with said arm to prevent rotation of the shaft.

13. A railway car having a door, a stiffening member mounted upon the door, a shaft rotatably mounted on the stiffening member, the said shaft having an eccentric portion formed thereupon, a latch pivoted upon the car body and adapted to engage the eccentric portion of the shaft to hold the door in different positions of closure as the shaft is rotated, and an arm mounted upon the shaft, the said arm comprising means for effecting rotation of the shaft and arranged to overlie the side of the car when the door is fully closed, means mounted upon the side of the car adapted to cooperate with said arm to prevent rotation of the shaft, and means coacting between the arm and the latch to prevent pivotal movement of the latch when the door is thereby supported in fully closed position.

In testimony whereof I affix my signature.

BYERS W. KADEL.