Aug. 3, 1926. 1,594,651

A. E. ZIMMER

DOOR LOCKING MECHANISM

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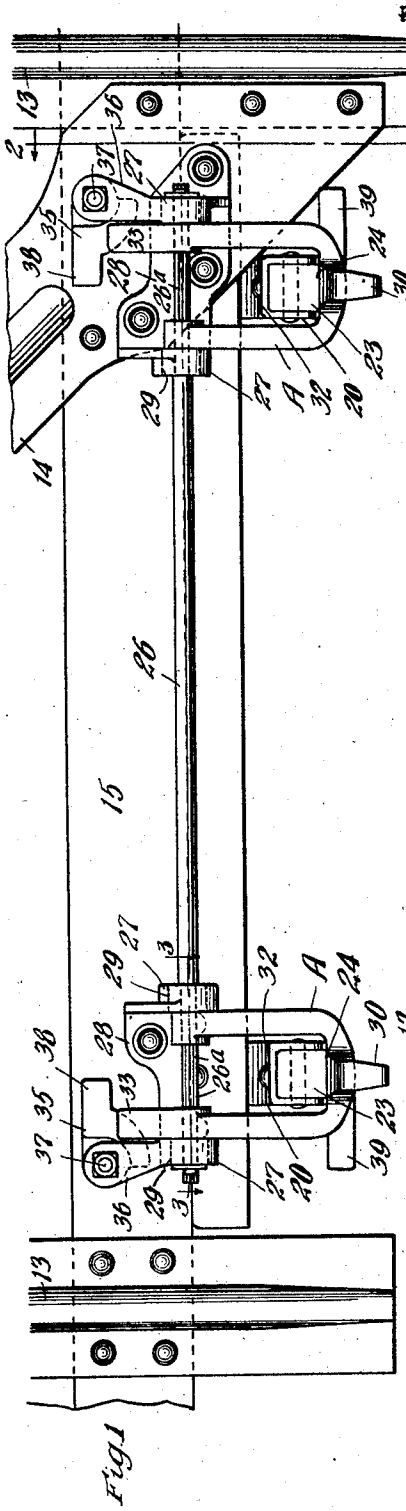


Fig. 1

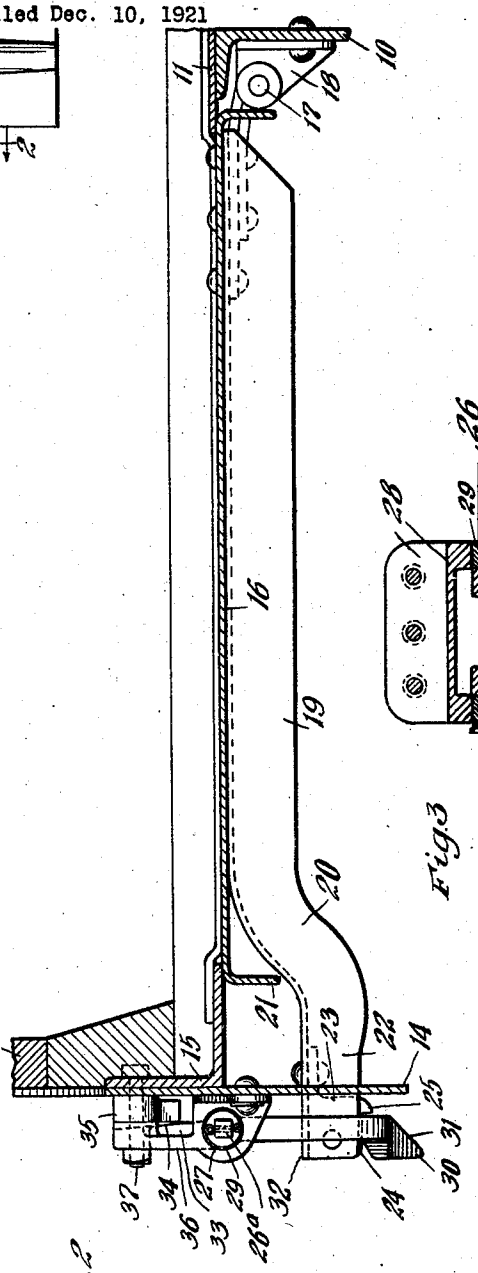


Fig. 2

Fig. 3

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DOOR-LOCKING MECHANISM.

Application filed December 10, 1921. Serial No. 521,307.

This invention relates to improvements in door locking mechanisms.

The object of the invention is to provide an efficient mechanism for retaining doors in closed position, the mechanism being especially adapted for dump cars and of such construction that it may be manufactured and applied at very small expense.

In the drawing forming a part of this specification, Figure 1 is a side elevational view of a portion of a drop bottom dump car showing my improvements in connection therewith. Figure 2 is a vertical, transverse, sectional view of the car corresponding substantially to the line 2—2 of Figure 1. And Figure 3 is a detail sectional view corresponding to the section line 3—3 of Figure 1.

In the drawing I have shown only enough of the car structure to illustrate the manner of carrying out the invention. As will be understood by those skilled in the art, the mechanism may be duplicated for each of the doors with which the car is provided.

In said drawing, 10 denotes one of the channels employed to make up the usual type of girder center sill, 11 a longitudinally extending central floor strip or plate, 12 the side wall of the car, 13 the side stakes, 14 one of the diagonal side wall braces and 15 an angle side sill. A floor door is indicated at 16, the same being pivotally attached to the center sill by suitable hinge butts 17 pivotally connected to castings 18 riveted to the channel 10, thus adapting the floor door 16 to swing about an axis extending lengthwise of the car and with the free edge of the door adjacent the side of the car.

To hold the door in closed position, I preferably employ the following arrangement. Secured to the under side of the door near each side edge thereof is a brace 19 of inverted U-shape, each of said braces 19 having its outer end downwardly deflected as indicated at 20 to clear the usual edge flange 21 of the door, and thence extended outwardly horizontally as indicated at 22, the latter extension passing beyond the plane of the side wall of the car, as clearly shown in Figure 2.

Secured within the outer end of each brace 19 is a cast block 23, the latter having the lower face 24 thereof disposed slightly below the lower edges of the flanges of the brace 19 so that the wear will take place on the block 23 rather than upon the brace 19. At a point removed from the extreme end of the brace 19, the block 23 is provided with a downwardly extending shoulder or lug 25, which acts as a limiting stop for the supporting loop, as hereinafter described.

In line with each of the braces 19, I provide a U-shaped supporting loop designated generally by the reference A. Said loops, as shown, are non-rotatably mounted on a common longitudinally extending shaft 26 which is rotatably mounted in suitable bearings 27—27 formed on a corresponding pair of supporting brackets 28—28 which are riveted to the side wall structure of the car so as to locate the shaft 26 approximately at the same level as the top of the door 16. With this construction, it will be observed that the two loops A—A are movable in unison. Preferably the ends of the shaft 26 are made of square cross section as indicated at 26^a and the openings in the free ends of the arms of the loops A correspondingly shaped, the shaft being made rotatable in the bearing 27 by suitable bushings 29—29 applied to the square sections 26^a and fitting within circular openings of the bearings 27. Endwise movement of the shaft 26 is prevented by any suitable means such as the washers and cotters shown in the drawing.

Each loop A, at the bottom thereof, is provided with a downwardly and outwardly extending lug 30 located midway between the side arms of the loop. Said lug 30 is formed with an inclined or beveled edge 31 so positioned that, when the loop is hanging freely in a vertical position, the upper corner edge 32 of the corresponding door brace will engage with said beveled face 31 and push the loop outwardly when the door is being raised. When the door has been elevated to fully closed position, the loop is then free to slip under the ends of the braces to the position shown in Figure 2 and the swinging movement limited by the stop lug 25.

At the top, one arm of each loop A is provided with an upward extension or tail-piece 33, the back face of which is slightly upwardly and outwardly beveled as indicated at 34 in Figure 2. Adapted to cooperate with each of the tail pieces 33 is a sector-like plate 35 pivotally supported between the car structure and a flange 36 of the

bracket casting 28, as by means of the pivot bolt 37. Each plate 35 has a finger-piece extension 38 to facilitate manipulation thereof. When the loops A are in their vertical operative position, the plates 35 are swung downwardly behind the tail-pieces 33 and cammed by the surfaces 34 so as to hold the loops A rigidly in proper supporting position.

At the bottom, each of the loops A is also provided with a horizontal longitudinally extending lug 39, the lugs 39 being preferably extended toward the nearest side stakes or other depending portions of the side wall structure of the car. The lugs 39 provide efficient fulcrum points for prying the loops A from under the door braces, it being understood that suitable pinch bars or other tools are inserted beneath the lugs 39 with the ends of the pinch bars resting upon an adjacent part of the car.

With the arrangement shown, it will be seen that the parts may readily be maintained in locked position without any danger of accidental opening of the doors. The release of the doors is easily effected by first throwing out the locking plates 35 and then prying one of the loops outwardly in the manner above described. In the instance shown where the two loops are secured to a common shaft, manipulation of one loop will be sufficient to effect either the locking or release of the doors. As will be understood by those skilled in the art, the loops and associated parts may be mounted independently without in any wise departing from the spirit of the invention. All changes and modifications coming within the scope of the claims are contemplated.

I claim:

1. A locking mechanism for vehicles having a discharge door pivoted to a relatively fixed portion of the body thereof, said mechanism comprising: an extension from the free edge of the door; a pivotally suspended latch element in line with and adapted to engage under said extension; and means for positively locking said element in its operative position to prevent it coming out from under said extension, said means comprising a tail-piece extending from the upper end of the latch element and a pivotally mounted member adapted to swing on an axis at right angles to the axis of said element in position behind said tail-piece.

2. A locking mechanism for vehicles having a discharge door pivoted to a relatively fixed portion of the body thereof, said mechanism including: a brace secured to the under side of the door and extending beyond the free edge thereof, said brace being of inverted U-shape; a block secured within said extended end of the brace and having a bearing face downwardly offset below the edges of the flanges of said brace, said block having a limiting stop shoulder on the under side thereof; and a loop pivotally supported from the body portion of the vehicle adapted to engage said under face of the block.

3. A locking mechanism for vehicles having a discharge door pivoted to a relatively fixed portion of the body thereof, said mechanism comprising: an extension from the free edge of the door; a pivotally suspended latch element in line with and adapted to engage under said extension; and a lug projecting from said element near the bottom thereof under which a bar or other tool is adapted to be placed to thereby pry said element from under said extension.

4. In a locking mechanism for a pivoted dump car door, the combination with an extension from the free edge of the door, said extension being provided on the under side thereof with a limiting stop shoulder; of a loop pivotally suspended from the body of the car adapted to swing under said extension and be limited in its swinging movements thereunder by said shoulder, said loop having an upwardly extended tail-piece; and a pivotally mounted locking plate adapted to be swung between said tail-piece and the body of the car to thereby lock said loop in operative position.

5. In a locking mechanism for a pivoted dump car door, the combination with an extension from the free edge of the door; of a supporting loop pivotally suspended from the body of the car adapted to engage under said extension, said loop being provided at the bottom thereof with a laterally extended pry-off lug and an upwardly extended tail-piece at the top thereof; and a pivotally mounted locking plate adapted to swing behind said tail-piece to hold the loop in operative position.

6. In a locking mechanism for a pivoted dump car door, the combination with a pair of spaced arms extending from the free edge of the door, of a shaft pivotally supported on the body of the car opposite the free edge of the door and parallel to the pivotal axis of the door; a pair of loops non-rotatably secured to said shaft in line with said extended arms and adapted to engage under the latter to thereby support the door in closed position; and means for locking said shaft and loops in operative position, said means including an upwardly extended tail-piece from one of the loops and a pivotally mounted plate adapted to engage behind said tail-piece.

7. In combination with a freight car having a drop bottom door, a plate secured to the side of the car body and said plate having an opening therein to form a bearing, a swinging link mounted in said bearing, a member secured to the door and extending outwardly beyond the free side of the car

body, means secured to the outer end of said member to form an engaging surface for the bottom round of said link and means for holding the link in engagement with said means secured to said member to thereby support the door in a locked position.

8. In a locking mechanism for a pivoted dumping door, the combination with a pair of spaced projections from the free edge of the door; of a pair of loops pivotally suspended from the body of the vehicle in line with said extensions and adapted to engage under the latter to thereby support the door in closed position; means for operating said loops in unison; and means associated with each of the loops and movable in the path thereof for locking the same in closed position whereby the locking of one loop will also effectively serve to lock the other of said loops.

9. In a locking mechanism for a pivoted dump door, the combination with a pair of spaced arms extending from the free edge of the door; of a pair of loops pivotally suspended from the body of the vehicle in line with said extended arm adapted to engage under the latter to thereby support the door in closed position; separate locking means movable in the path of the respective loops; and means for insuring the movement of the loops in unison when swung in either direction.

In witness that I claim the foregoing I have hereunto subscribed my name this 30th day of Nov. 1921.

ALBERT E. ZIMMER.