Dec. 17, 1935. H. A. HILL ET AL 2,024,523

CAR DOORLATCH

Filed Jan. 25, 1934 3 Sheets-Sheet 1

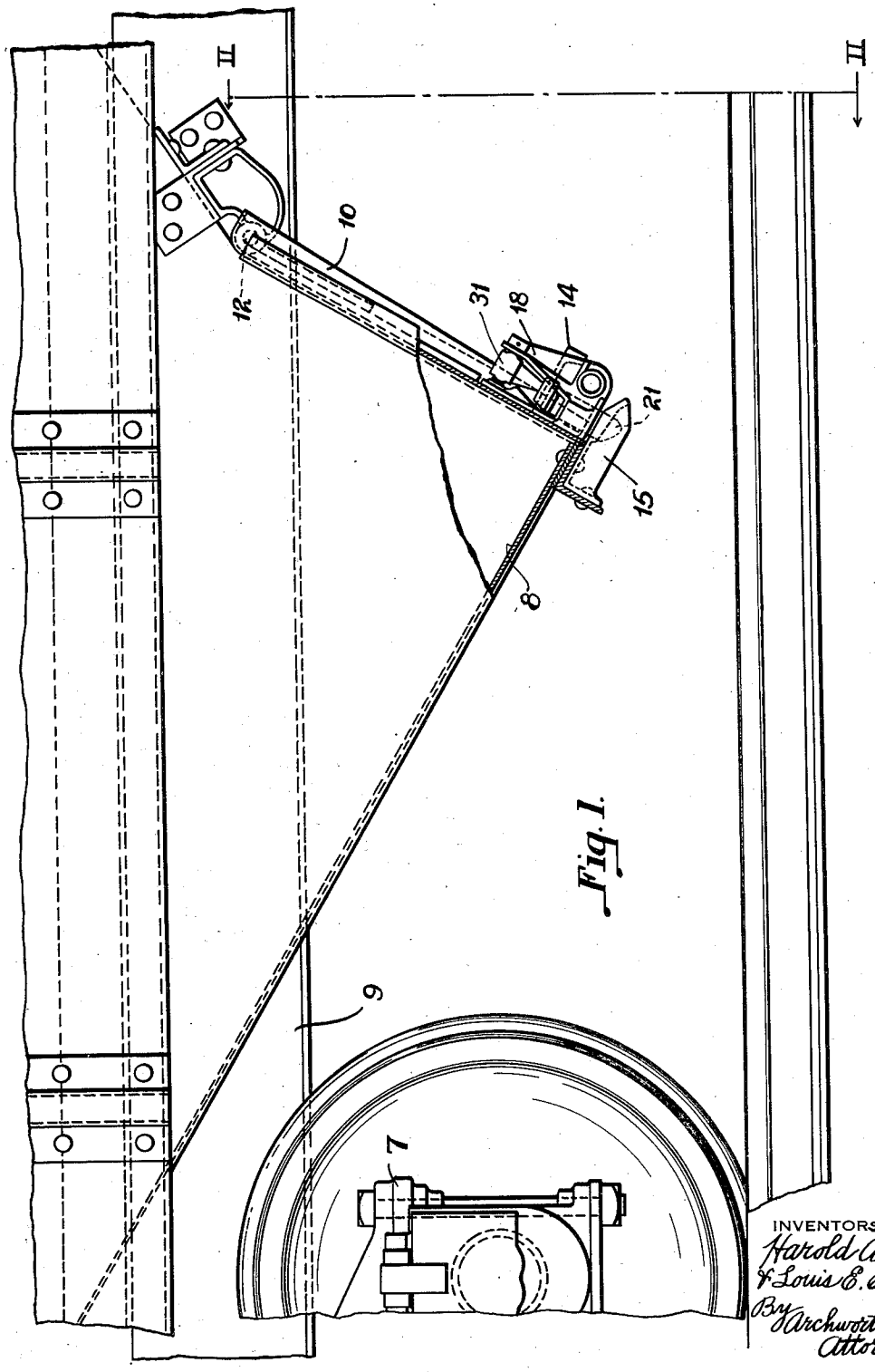


Fig. 1.

INVENTORS
Harold A. Hill
& Louis E. Endsley,
By Archworth Martin,
Attorney.

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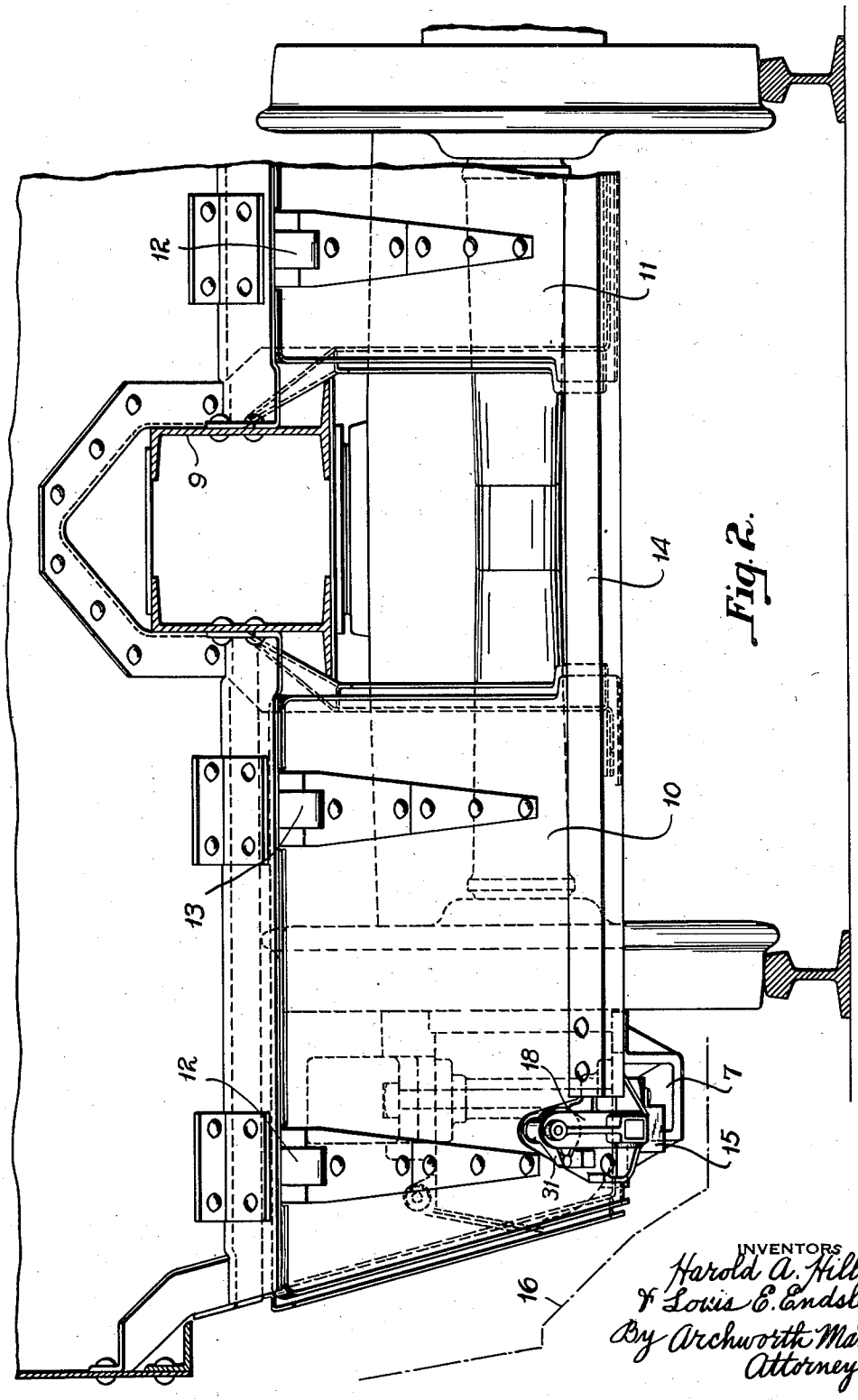


Fig. 2.

INVENTORS
Harold A. Hill
& Louis E. Endsley,
By Archworth Martin,
Attorney.

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Fig. 3.

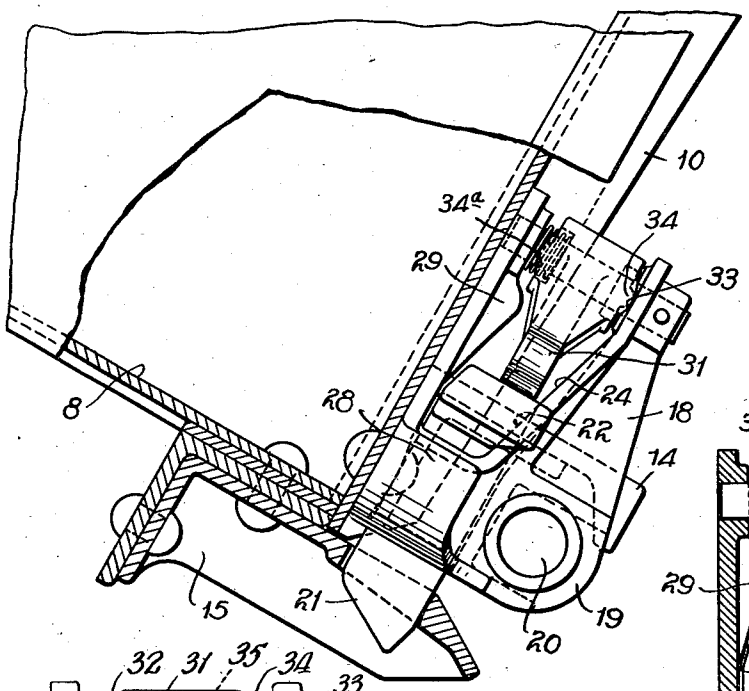
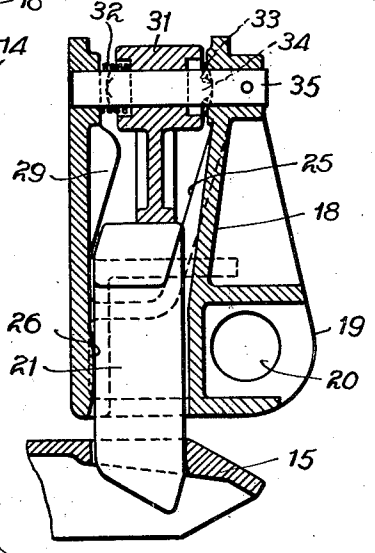


Fig. 5.



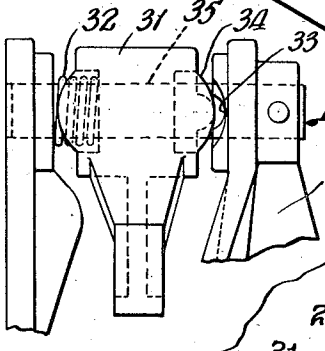


Fig. 6.

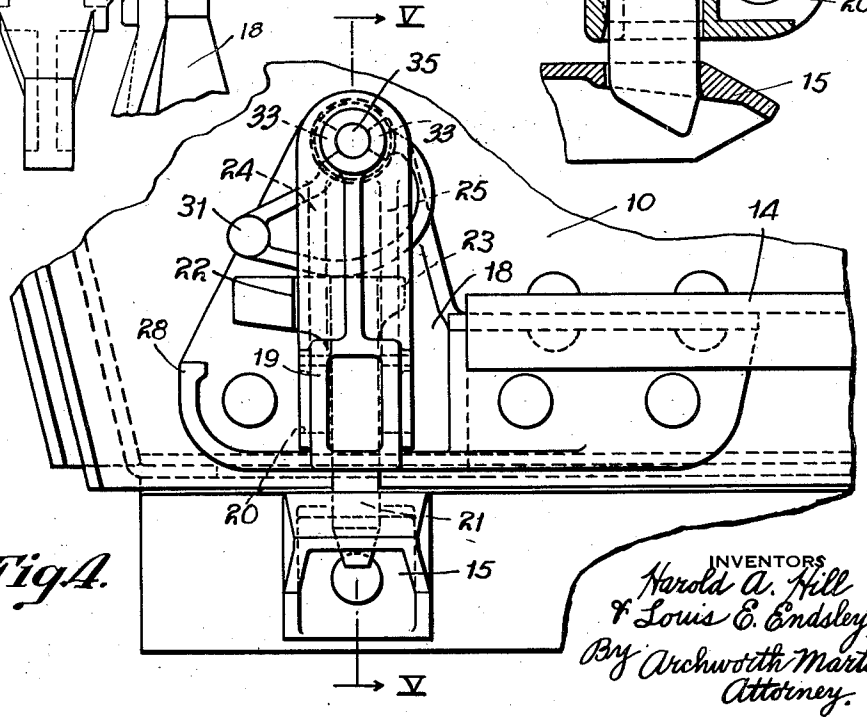


Fig. 4.

INVENTORS
Harold A. Hill
& Louis E. Endsley,
By Archwoith Martin,
Attorney.

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UNITED STATES PATENT OFFICE

2,024,523

CAR DOORLATCH

Harold A. Hill, McKees Rocks, and Louis E. Endsley, Pittsburgh, Pa., assignors to Fort Pitt Malleable Iron Company, McKees Rocks, Pa., a corporation of Pennsylvania

Application January 25, 1934, Serial No. 708,224

2 Claims. (Cl. 105—308)

Our invention relates to latch devices for car doors and the like, and is hereinafter described as employed more particularly in connection with the drop doors of railroad hopper cars.

One object of our invention is to provide a latch device that is so located with respect to the door that the door will be held closed more snugly throughout its length than in the case of certain other types of latch arrangements.

Another object of our invention is to provide a latch structure that is so located as to be well within the clearance lines established by the American Railway Association, and which can nevertheless be conveniently operated.

One form which our invention may take is shown in the accompanying drawings wherein Figure 1 is a side elevational view, partially in section, of a portion of a railroad hopper car; Fig. 2 is a view taken on the line II—II of Fig. 1; Fig. 3 is a sectional view, on an enlarged scale, of the latch mechanism of Fig. 1; Fig. 4 is a face view thereof; Fig. 5 is a view taken on the line V—V of Fig. 4, and Fig. 6 is a view on an enlarged scale of a portion of the structure of Fig. 3, with the dog moved axially against the spring and showing the retaining lug on the dog in spaced relation to the seating recess therefor.

The latch structure may be applied to various standard types of cars, and is herein shown as employed in connection with a hopper car which has truck side-frames 7, hopper bottom sheets 8, a longitudinal center sill 9, and a pair of drop doors 10 and 11, each of which is pivotally connected to the car body by a pair of hinges 12 and 13.

As viewed in Fig. 2, it will, of course, be understood that a portion of the car structure at the right hand side of the center sill 9 is broken away, and that the door 11 is a duplicate of the door 10 and may be provided with a similar latching arrangement. A stiffening bar or spreader 14 is rigidly secured to the doors 10 and 11, so that said doors may be moved in unison.

A keeper 15 is secured to the bottom sheet 8 and this keeper, together with the latch mechanism to be hereinafter described, is located substantially in longitudinal alignment with the adjacent truck-side frame 7, and above the lowermost edge of said side frame, so that the latch structure will be well within the American Railway Association clearance lines, which are indicated by the broken lines 16. The latch mechanism therefore will not engage any obstruction such as third rails or station platforms.

A latch bolt bracket 18 is secured to the spreader bar 14 and the drop door, by suitable bolts or rivets, and is located somewhat inwardly from the outermost edge of the door, so that it will be within the clearance lines above-referred to, and will also more effectively hold the door in snugly-closed position. The bracket 18 and the spreader bar 14 are mounted on the door adjacent to the lower edge thereof, thereby reinforcing such edge and effectively preventing outward bending of the lower edge of the door, by the weight of the car contents.

It will be seen that if the latch were so mounted as to extend beyond the outer edge of the door instead of being located between the hinges 12 and 13, the holding force exerted at the innermost edge of the door, near the longitudinal center line of the car, would not be so great, and such inner end of the door might sag open somewhat, and thus permit loss of the car contents. Further, such mounting of the latch necessitates the positioning thereof considerably above the lower edge of the door in order to be within the lateral American Railway Association clearance line:

As shown more clearly in Figs. 4 and 5, the bracket 18 has a pair of wing-like extensions 19 provided with holes 20, into which one end of a crow bar or the like may be placed, in order that an operator grasping the outer end of the bar may conveniently swing the door to closed position, so that the keeper 15 can be engaged by the latch bolt. The bracket 18 has a slideway extending parallel with the plane of the door, for a latch bolt 21 that can be moved into and out of engagement with the keeper 15, as hereinafter described.

The latch bolt has lateral extensions 22 and 23 at its upper end which engage with camming ribs 24 and 25, respectively. The slideway for the latch, near its lower end, is provided with a boss or protuberance 26 that serves as a fulcrum surface upon which the latch bolt will tilt when it is being moved downwardly to locking position. When the door approaches its closed position, the lower end of the latch bolt 21 will first engage in the keeper 15. As the bolt is moved downwardly, the camming ribs 24 and 25 will shift the upper end of the bolt toward the face of the door, thus rocking the bolt on its fulcrum, while the lower end of the bolt is in engagement with the latch, thereby

gradually forcing the door to snugly-closed position.

In order to facilitate raising of the latch, a shoulder **28** is provided on the bracket **18**, which shoulder will serve as a fulcrum for a crowbar whose inner end can be placed under the extension **22** of the latch bolt. Upon depression of the outer end of the bar, the latch bolt will, of course, be withdrawn from the keeper. During upward movement of the latch bolt, the lateral extensions **22** and **23** will engage camming ribs **29**, so that as the latch bolt is raised, it will be tilted in a clockwise direction, thus throwing its lower end inwardly toward the face of the door, and rendering it more readily engageable with the keeper **15**, when the door is again moved to closed position.

A dog **31** is pivotally mounted in the bracket **18** in such position as to be moved into and out of engagement with the upper end of the latch bolt **21**. During operation of the latch bolt, the dog **31** is, of course, placed in its upper or released position. In order to prevent accidental displacement of the dog from either its locked position or its release position, we provide a yieldable stop device which includes a coil spring **32** that yieldably holds the dog against one wall of the bracket, such wall being provided with two depressions **33**, at opposite sides of a pivot pin or shaft **35**, into one of which a nose-like projection **34** of the dog will seat at the locked and unlocked positions of the dog, the dog being, of course, slidable on its pivot pin **35**.

In order to permit duplicate dogs to be employed at both sides of the car, without the necessity of making separate dogs for the right and left-hand sides, we provide a second nose **34*a*** which, while it serves no purpose when the latch is mounted at the left-hand side of the car as in Figs. 3 and 4, will function when the latch is mounted at the right-hand side of the car, because at such right-hand side, the position of the dog will have to be reversed. In that case the nose **34*a*** will, of course, engage the recesses **33** of the bracket at the right-hand side.

The yieldable stop device is of particular utility on railway cars when instead of opening the doors the entire car is rolled over to discharge the contents. It will be seen that when the car is inverted to dump the contents, there is a tendency for the weighted end of the cam dog **31** to swing toward released position, with the result that it would lie away from the latch bolt when the car is returned to position on the track, and with consequent danger of the door coming open. The yieldable stop device referred to serves to prevent accidental release of the dog.

We claim as our invention:—

1. The combination with a car having an inclined drop bottom door that is hinged at its upper edge to the car body, of a keeper carried by the car body, a bracket carried by the door and provided with a guideway extending parallel to the plane of the door, a latch bolt slidably supported in the guideway in position to engage the said keeper, a pivot pin mounted in the bracket at a point above the latch bolt and disposed perpendicularly to the plane of the door, a dog mounted on the pin for movement about the axis thereof into engagement with the top of the latch bolt, and also having limited sliding movement axially of the pin, a lug integral with the lower side of the dog for cooperation with a recess provided in the adjacent surface of the bracket which is positioned to receive the said lug when the dog is in its lowermost position of axial movement and in locking engagement with the latch bolt, the lug being of such thickness and the recess being of such depth that the dog will be held against rotative movement under vibrational forces, and a spring interposed between the opposite side of the dog and an adjacent portion of the bracket for yieldably maintaining the lug in the recess.

2. The combination with a car having an inclined drop bottom door that is hinged at its upper edge to the car body, of a keeper carried by the car body, a bracket carried by the door and provided with a guideway extending parallel to the plane of the door, a latch bolt slidably supported in the guideway in position to engage the said keeper, a pivot pin mounted in the bracket at a point above the latch bolt and disposed perpendicularly to the plane of the door, a dog mounted on the pin for movement about the axis thereof into engagement with the top of the latch bolt, and also having limited sliding movement axially of the pin, a lug integral with the lower side of the dog and cooperating with recesses provided in the adjacent surface of the bracket, which recesses are positioned to receive the said lug when the dog is at its lowest position of axial movement and occupying either its locked or unlocked position, the lug being of such thickness and the recesses being of such depth as to hold the dog against rotative movement under vibrational forces, and a spring interposed between the opposite side of the dog and an adjacent portion of the bracket for yieldably maintaining the said lug in the said recesses.

HAROLD A. HILL.
LOUIS E. ENDSLEY.