Sept. 24, 1929. E. C. ELLIS ET AL 1,729,375

CAR DOOR MECHANISM

Filed July 20, 1926

Fig. 1

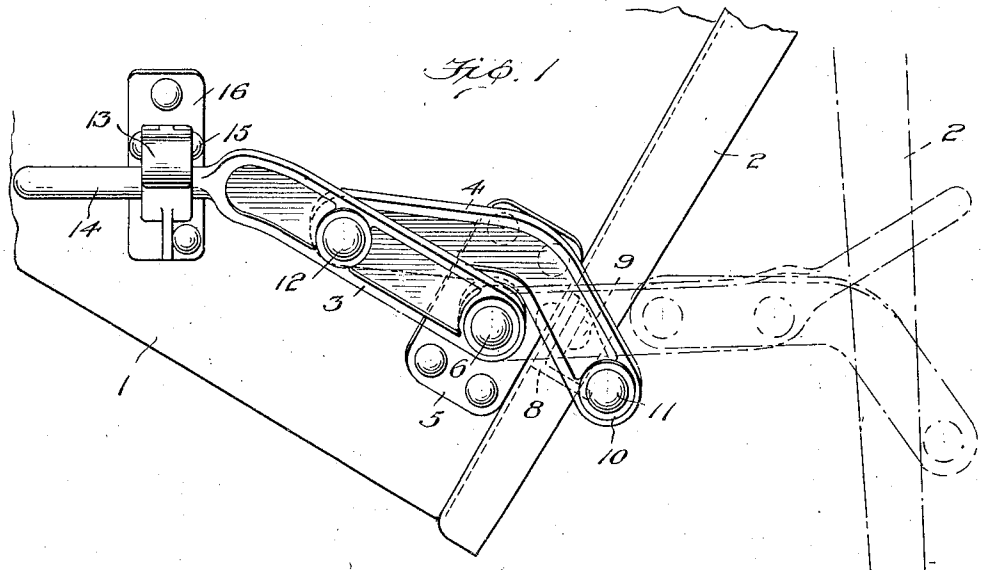


Fig. 3

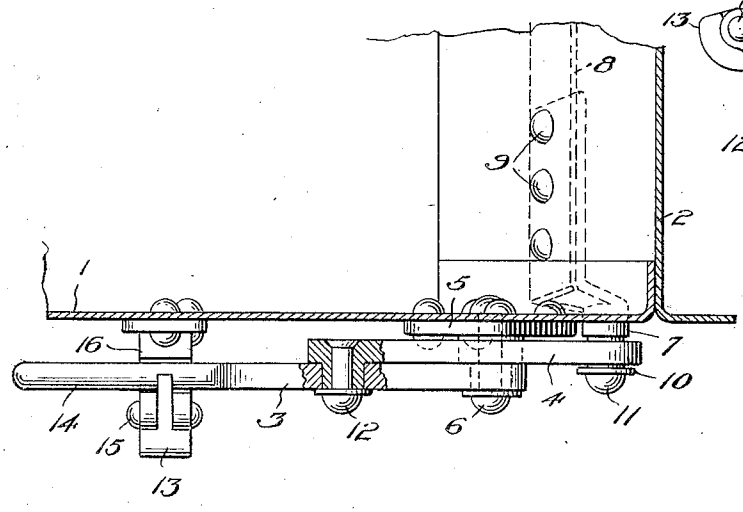
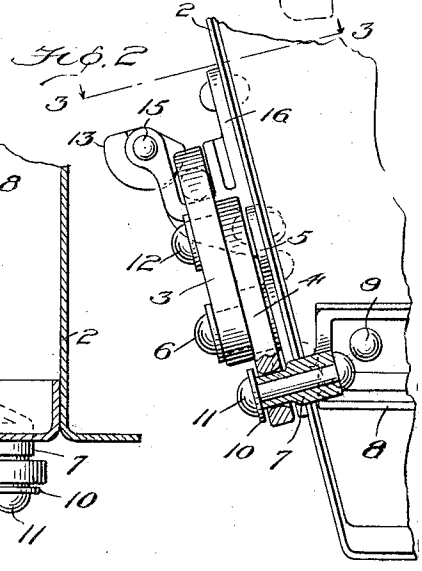


Fig. 2



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UNITED STATES PATENT OFFICE

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CAR-DOOR MECHANISM

Application filed July 20, 1926. Serial No. 123,655.

Our invention relates to car door mechanism for application to railway cars having a lading discharge opening which is closed by a swinging door.

The principal object of the invention is to provide simple and efficient means for controlling the swinging movements of the door and for securely sustaining the door in closed position.

A primary feature of the invention consists in controlling the swinging movements of the hinged door by means of a plurality of pivotally connected members one of which is pivotally attached to the door and the other to the car body adjacent the lading discharge opening thereof, one of the pivotally connected members being a lever and the other constituting a link adapted to be actuated by the lever, and means being provided for preventing the lever and link from accidentally rotating when the door is in closed position.

A further feature of the invention consists in providing, in association with a car body having a discharge hopper formed with an inclined outer side wall, mechanism for controlling the swinging movements of the door for closing the hopper, the said mechanism comprising relatively movably connected members one of which is movably mounted on the incline wall of the hopper adjacent the lading discharge opening, one of the movably connected members being a lever and one being formed as a link capable of being actuated by the lever, the plane of operation of the lever forming an oblique angle with the hinge axis of the door and being substantially parallel to the inclined wall of the hopper.

Other features of the invention residing in advantageous combinations of parts and in structural details will hereinafter appear.

In the drawings chosen for the purpose of illustrating the invention, the scope whereof is pointed out in the claims,

Figure 1 is a side elevational view of a portion of a hopper car equipped with a door mechanism embodying the invention, the relations of the parts when the door is open being shown in dotted lines.

Figure 2 is a view, partly in end elevation and partly in section, of the construction shown in Figure 1.

Figure 3 is a sectional view on the line 3—3, Figure 2.

The hopper car to which the door locking mechanism is shown as applied is of a well known type and therefore only a portion of one of the hoppers has been illustrated in the drawings. In cars of this type the doors are arranged on opposite sides of the car center sills and are rigidly connected by a door spreader or stiffener beam so as to operate together and in effect constitute a single door.

In the drawings 1 indicates the inclined side sheet or side wall of a car hopper whose lading discharge opening is closed by a swinging door 2. The door which may be hinged to the car body in any usual or convenient manner may advantageously be of the sheet metal type formed with marginal stiffening flanges.

The means for controlling the swinging movements of the door and for locking the door in closed position include a manually operable lever 3 and a link 4 pivotally connected thereto, the lever being pivotally mounted upon the door and being adapted to be actuated by the lever. The pivotal mounting for the lever may conveniently be formed as a bracket 5 which is riveted to the side sheet of the hopper and to which the lever is connected by means of a pivot rivet 6. The link 4 is preferably pivotally attached to the door by being rotatably mounted upon a hollow cylindrical stud or pivot post 7 which may advantageously be fashioned as a bracket rigidly secured to the door spreader 8 by means of rivets 9. The link is maintained in assembled relation to its pivot post 7 by means of an overlying washer 10 through which and through the pivot post a rivet 11 extends. The axis of rotation of the link 4 and that of the operating lever 3 are substantially parallel and are disposed so that the plane of operation of the lever is oblique to the hinge axis of the door and substantially parallel with the inclined side wall 1 of the hopper. The link 4 which is pivotally connected to the lever intermediate the ends of the latter by means of a rivet 12, is preferably positioned between the lever and

the hopper side wall and it is fashioned as an angular member affording a recess for receiving the stud or pivot 6 by which the lever is pivotally mounted on the car body. By this means the several pivotal points 6, 11 and 12 of the lever and link mechanism are enabled to position themselves approximately in alinement when the door is closed, so that the load upon the door does not tend to induce a door releasing movement of the mechanism.

While the throw of the lever 3 is preferably such that the load upon the door does not produce door releasing rotations of the elements of the machanism, it is preferred to positively maintain the lever in door locking position by means of a latch 13 adapted to engage the handle 14 of the lever. This latch, which is weighted on one side so as to swing into locked position automatically after the lever has passed below it, may be advantageously secured by means of a pivot rivet 15 to a bracket 16 attached to the side sheet of the car.

When the door 2 is to be opened the latch 13 is rotated so as to permit the lever 3 to be rotated clockwise. This motion of the lever actuates the link 4 attached thereto and forces the door to open position, as indicated in dotted lines in Figure 1. When the door is to be closed the operator grasps the handle 14 and rotates the lever in the counterclockwise direction thereby moving the link 4 to the position shown in Figure 1 and thus closing the door.

It will be apparent that the mechanism embodying the invention is extremely rugged and compact and affords efficient means not only for forcing the door to closed position but also for forcing it open in the event it should be stuck or frozen in closed position.

We claim:

1. Car door mechanism involving, in combination with a car body, provided with a discharge hopper and a hinged door for closing the discharge opening of the hopper, means for controlling swinging movements of the door, said means including a lever pivotally mounted on the side of the hopper adjacent the discharge opening thereof, the plane of operation of said lever being substantially parallel to the hopper side, a link pivotally mounted on the door and pivotally connected to the lever intermediate the ends of the latter, and means for retaining the lever and link in door supporting position when the door is closed, said lever being provided with a handle, the lever and link being disposed outwardly of the car side in overlapping relation.

2. Car door mechanism involving, in combination with a car body provided with a discharge hopper having an inclined outer side wall and a hinged door for closing the discharge opening of the hopper, means for controlling swinging movements of the door, said means including a plurality of relatively movable connected members one of which is movably attached to the door and one of which is movably mounted on said inclined side wall adjacent the discharge opening of the hopper, one of said movably connected members being formed as a lever and one being a link adapted to be actuated by the lever, and the plane of operation of the lever being oblique to the hinge axis of the door and in substantial parallelism with the inclined wall of the hopper.

In testimony whereof we affix our signatures.

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