RAILWAY CAR DROP DOOR

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Fig. 9

Fig. 10

Fig. 11

Fig. 12

Fig. 13

Fig. 14

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The invention relates to railway cars of the dumping type but more specifically to the so-called "general service" gondola cars wherein the floor consists of a plurality of doors, which doors usually have one end hinged to the center construction of the car and the other end supported by the side wall of the car when the door is in closed position. Such doors are usually each provided with a plurality of hinge elements and support elements, and I provide a beam element between each hinge element and its opposite supporting element. When two hinges are used to each door each of such beams supports substantially 50% of the load imposed upon the door and where three hinge elements are used each beam supports substantially one-third of the load imposed upon the door.

Such cars are provided with stops adjacent the sides of the door opening to restrict the downward movement of the door and the door is provided with bumpers to engage these stops. The stops are usually spaced to divide the length of the door into thirds according to known mechanical principles. I provide a beam element extending between the bumpers on the door which is substantially normal to the beam element extending between the hinge and supporting elements.

When the door is dropped the load follows the door and at the moment of impact of the bumpers with the stops, this beam element carries substantially two-thirds of the load imposed upon the door. (See Fig. 2).

The object of this invention is to provide a hinged door for a railway car, which door is reinforced by beam elements which function when the door is in closed position and another beam element which functions when the door is in open position. Another object of the invention is to secure co-operation between these different beam elements whereby each beam element reinforces each other beam element.

In the drawings:
Figs. 1, 2 and 3 show a typical application of my invention to a railway car.
Figs. 4 to 8 inclusive show a form of the door in detail.
Fig. 9 shows a modified construction: Fig. 10 is a section on line 10—10 of Fig. 9; Fig. 11 is a section on line 11—11 of Fig. 9; Figs. 12, 13 and 14 are illustrative diagrams.

In the drawings, the usual parts of the car are shown, such as center sills or center construction 1; cover plate 2; cross diaphragms 3; side wall 4; operating shaft 5; raising chain 6 and stop 7.

The door is provided with hinge elements 10 adjacent one end thereof which engage the hinges 11 mounted on the center construction 1. The door is also provided with support elements 12 adjacent the other end of the door to which the raising chain 6 is secured. The term "support elements" means any means adjacent the outer end of the door which rests upon a part of the car proper to support the door when it is in closed position. The door is further provided with a rib or beam element 13 extending between each of the hinge elements 10 and the opposite support elements 12. The bumpers 14 are preferably positioned adjacent the opposite sides of the door and another rib or beam element 15 substantially normal to the first mentioned rib or beam element is provided which extends between said bumpers.

I also preferably provide brackets 36 extending from the ribs toward the corners of the door to prevent the drooping of these corners and reinforcing ribs 37 between the hinge elements and reinforcing ribs 38 between the support elements.

As the ribs forming the beam element between the bumpers must support a greater load than the other beam elements they are preferably deeper so as to make them relatively stronger.

The different beam elements cross each other and are so formed as to prevent either one of them from deflecting under stress, thereby co-operating to strengthen each of them.

I prefer to make the door of cast metal wherein it is easier to distribute the metal in the door according to the stress imposed upon the various parts and a casting also eliminates fabrication and assembling of the various parts, and furthermore, assures that the various parts of the door will remain intact and
will not be loosened or severed by the motion of the train in service. The invention, however, is not limited to a cast metal door and Figs. 9, 10, and 11 show a construction wherein the body of the door is made of a rolled metallic plate having a beam element 50, shown as a T section extending between the hinge elements 51 and the support elements 52. The beam element 50 is preferably attached to a flange 53 adjacent each end of the door. The door is also provided with a strap 54 which is secured to flanges 55 at the side margins of the door. When the door is in open position it rests upon the end portions of the strap 56 which forms the bumpers and the strap in combination with the beam elements (forming struts) forms a truss between the bumpers. The metallic plate may be reinforced with corrugations 57.

Figs. 12, 13, and 14 are diagrams wherein Fig. 12 shows the beam elements "a" extending between the hinge elements "a" and supports "c" and the other beam elements "b" extending between the opposite bumpers "b". The shaded portion in Fig. 13 shows the area of the load supported by one of the beam elements "a" which is one-half of the load. The shaded portion in Fig. 14 shows the area of the load supported by the beam "b" which is about two-thirds of the load, thus the beam "b" should be one-third stronger than the beam "a".

The accompanying drawings illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

I claim:

1. A door for a railway dump car comprising hinge elements adjacent one end thereof, support elements adjacent the other end thereof, bumpers adjacent the opposite sides thereof, a rib extending between each of the hinge elements and the opposite support elements, and a deeper rib substantially normal to the first mentioned ribs extending between said bumpers.

2. A door for a railway dump car comprising hinge elements adjacent one end thereof, support elements adjacent the other end thereof, bumpers adjacent the opposite sides thereof, a rib extending between each of the hinge elements and the opposite support elements, and a deeper rib substantially normal to the first mentioned ribs extending between said bumpers.

3. A door for a railway dump car comprising hinge elements adjacent one end thereof, support elements adjacent the other end thereof, bumpers adjacent the opposite sides thereof, a rib extending between each of the