RAILROAD CAR CONSTRUCTION

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Field of Search 105/377, 251, 214/42 R, 214/63, 58, 152

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ABSTRACT
An open top gondola or hopper car construction is provided, the car having a plurality of hinged cover doors which are lifted to permit loading as the car is moved continuously along a track. When the loading of a car is completed, the cover doors are returned to closed position in which they are latched until the car arrives at a discharge station where again, with the car moving, the latch is released and the cover is raised a small amount by springs to permit unloading of the car as the car is rotated in a rotary dumper of known construction.

8 Claims, 10 Drawing Figures
RAILROAD CAR CONSTRUCTION

BACKGROUND OF THE INVENTION

Hereofore most covered rail cars were loaded through holes in the covers and unloaded by being either tilted or through assorted bottom discharge systems. Such systems are not suitable for loading a car without stopping the entire train. The present invention makes it possible to load a train of cars without stopping the train and to close adequately both loaded and empty cars to weather conditions.

SUMMARY OF THE INVENTION

The main purpose of this invention is to provide for automatic opening and closing of roof segments on top of a moving rail car during loading and unloading operations.

Additionally, this invention allows the use of roof segments on top of a rail car which prevents rain and snow from entering the car to freeze and cause unloading difficulties. In addition, the roof segments prevent dust from blowing out of the car.

Another object of the invention is to eliminate the need for manual opening and closing of roof segments during loading operations and obviate resulting schedule delays.

Still another purpose of this invention is a system which will allow cars to be emptied by a rotary car dumper.

Other objects of this invention will become apparent upon an understanding of the following description of the preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing a gondola car having several covers each of which is raised to permit loading while the car is moved along a track.

FIG. 2 comprises three front views of a rail car showing the cover being moved from a closed position to an open position for loading, these being respectively designated as A, B and C.

FIG. 3 is a plan view showing how a latch holding the cover in closed position is released.

FIG. 4 is a side elevation of a portion of the car showing the latch structure.

FIG. 5 is a section taken along the line 5—5 in FIG. 3.

FIG. 6 is a section taken along the line 6—6 in FIG. 5, showing the latch mechanism and means for releasing the latch.

FIG. 7 is a view taken along the line 7—7 in FIG. 4 showing the mast which is attached to the top of the cover and its relation to the spaced rails for effecting movement of the cover.

FIG. 8 is a section taken along the line 8—8 in FIG. 3 showing the hinge for the cover.

FIG. 9 is a plan view showing the relation between the spaced rails for moving the cover from closed to open position and the relation of these to the railroad track.

FIG. 10 is a side elevation of the spaced rails which effect the movement of the cover and the supports for the rails.

FIGS. 9 and 10 show only that portion of the rails which effect the movement of the cover from closed to open position, the rails continue so that the cover is moved from open to closed position, in this section the rails being a mirror image of the showings of FIGS. 9 and 10. In these views, the overall length of the scroll rails 60 and 65 has been compressed by approximately one-fourth to facilitate showing of these figures.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1, I have shown railroad track 20 and 21 with a gondola car 22 being moved along the track continuously. In practice a group of cars are attached together by coupling means 23 at each end of the cars to make up a train which is moved past the loading chute 24 which discharges a fluent solid material from a hopper (not shown).

The car shown in FIG. 1 has five roof segments but more or less than this number can be utilized. Each cover 27 is hinged by two hinges, generally indicated at 28, provided adjacent opposite ends of each cover and on one side of the car. Details of the hinge are shown in FIG. 8.

Each cover is maintained in a closed position during transit of the train by a latch, generally indicated at 31, including a recessed member 32 engaged with a rod 33 extending between spaced cars 34 attached to an angle iron 36 fastened to the upper outer edge of the car. Latch 31 is supported for pivotal movement on pin 37 extending between cars 38 attached to the underside of the angle iron 36. The latch includes a depending portion 39 which is engaged with a leaf spring 41 secured to the side of the car and which urges the latch member into latching position. The extending end 42 of the latch member is engaged with a horizontally extending release member 43 which is suitably supported from an inverted U-shaped frame 72A extending over the track 20 on each side thereof and adjacent the side of the car adjacent to a first position 51 to move the latch counterclockwise in FIG. 6 and so release the latch. Several spring means 35 are provided (FIGS. 5 and 6) so that, upon the release of the latch, the cover moves upward and is free of the latch.

To effect the lifting of each cover from a position in which the cover is closed to a position in which the cover is in an open position, I provide a mast, generally indicated at 61, on each cover, the mast including a base member 62 attached to the cover and having an arcuately formed portion 63 extending upwardly and terminating in a roller support 64 which extends horizontally. Roller 66 is mounted on the roller support 64 on bearings 67.

To effect the movement of the cover, I provide in suitable relation to the track 21 a pair of scroll rails 60 and 65 which the roller 66 engages to the spaced rails at position 51 where the spaced rails are in a position substantially over track 20. The rails are supported by a series of spaced supports 72 and which are provided in such relation to tracks 20 and 21 that movement of the cover by the spaced rails is effected as the train traverses the tracks 20 and 21. Thus the spaced rails extend over the track from the first position 61 in which the rails extend parallel to the track and are spaced apart vertically. The rails curve away from the track as at the second position 52 to a third position 53 in which the rails extend parallel to the track. The rails change their spaced relationship between the second position and the third position from one in which the rails are spaced apart vertically to one in which the rails are
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3 spaced apart horizontally. This changing in the relation of the rails is shown in FIGS. 2A, B and C.

The rails extend from the third position 53 to a fourth position 54 corresponding to the location of the chute 24 for filling up each car as it moves along tracks 20 and 21. Beyond the fourth position, the tracks are provided in a mirror image of the track between the first and the fourth positions so that each cover is gradually lowered and is released to drop into a position in which the latch 31 is engaged by the rod 23 and the cover is secured in latched position so that the contents of the car are protected against wind, rain and snow during movement of the train to a point whereat the contents of the car are discharged.

We claim:

1. Means for effecting loading of a material into a rail car as the car is moved continuously over a track section past a chute discharging the material into the car, a cover on the car hinged along one side thereof to one side of the car, a latch on the other side of the cover and car for holding the cover in closed position over the car, latch engaging means positioned along side of the track adjacent the path of movement of said other side of the car for engaging and releasing the latch as the car moves therepast, means for raising the cover to a position in which the top of the car is exposed for filling of the car with the material, the raising means including an upright mast secured at a lower end thereof to the cover adjacent said other side thereof and extending upwardly from the cover and having a rail engaging member at an upper end thereof extending substantially parallel to the plane of the cover, and rail means supported adjacent the path of travel of the car in a position for engaging the underside of the member and pulling the member upwardly and away from the car first to pull the cover from a closed position to an open position to permit filling of the car as the car traverses the track and for thereafter lowering the cover from its open position to a closed position in which position the cover is retained by the latch.

2. In the means of claim 1 wherein the rail means comprises a pair of spaced rails which extend over the track section from a first position in which the rails extend parallel to the track and are spaced apart vertically to a second position from which the rails curve away from the track to a third position in which the rails extend parallel to the track, the rails changing their relationship between the second position and the third position from one in which the rails are spaced apart vertically to one in which the rails are spaced apart horizontally.

3. In the means of claim 2 wherein the rails extend from the third position to a fourth position spaced along the track from the third position, the chute for discharge of the material being at the fourth position.

4. In the means of claim 3 wherein the rails beyond the fourth position are provided in a mirror image position of the rail positions between the first and fourth positions.

5. In the means of claim 4 wherein the rails beyond the fourth position terminate at a point in advance of that position wherein the car is in closed position to permit the cover to fall into closed position to engage the latch.

6. In the means of claim 1, wherein the mast includes a base secured to an upper surface of the cover and extending substantially perpendicular to the cover, an inclined midportion extending angularly upwardly from the base, and said member connected to the upper end of the inclined midportion.

7. In the means of claim 6, wherein the member comprises a roller mounted for rotation about an axis substantially parallel to the plane of the cover.

8. In the means of claim 1, wherein there are a plurality of covers on each car, each cover constructed to cover only a portion of the length of the open top of the car, said plurality of covers arranged end-to-end from one end of the car to the other end thereof and adapted to selectively expose and cover substantially the entire open top of the car.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,831,792 Dated August 27, 1974
Inventor(s) Fred W. Waterman et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

The assignee should read "Otter Tail Power Company".

Signed and sealed this 19th day of November 1974.

(SEAL)
Attest:

McCoy M. Gibson Jr. C. Marshall Dann
Attesting Officer Commissioner of Patents