Nov. 3, 1964 J. L. CARNEY, JR 3,155,052

HATCH COVER FOR RAILWAY CARS

Filed May 29, 1963 3 Sheets-Sheet 1

FIG. 1.

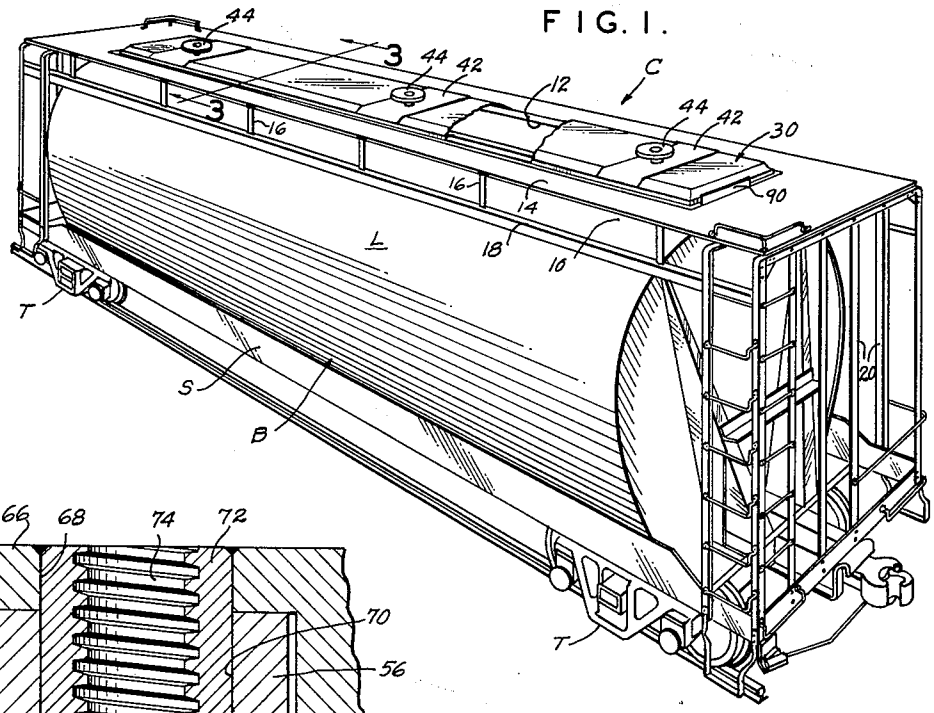


FIG. 5.

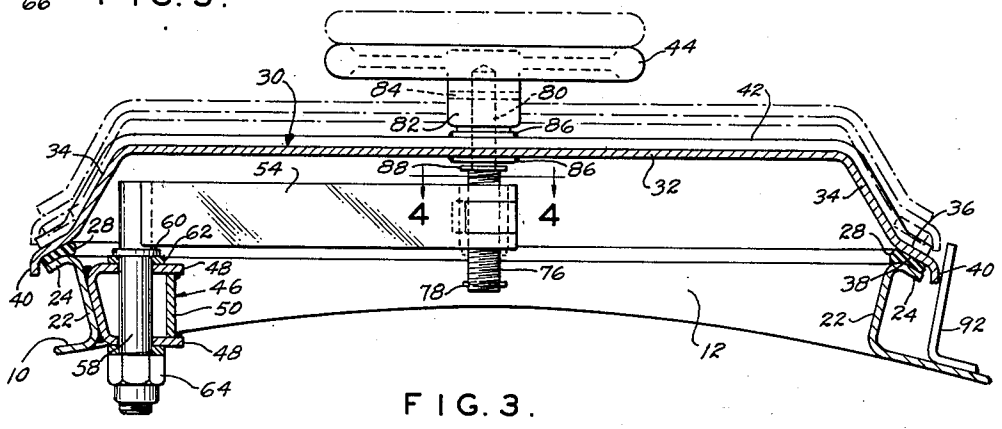


FIG. 3.

INVENTOR.
JOHN L. CARNEY JR.
BY

AGENT

Nov. 3, 1964 J. L. CARNEY, JR 3,155,052

HATCH COVER FOR RAILWAY CARS

Filed May 29, 1963 3 Sheets-Sheet 2

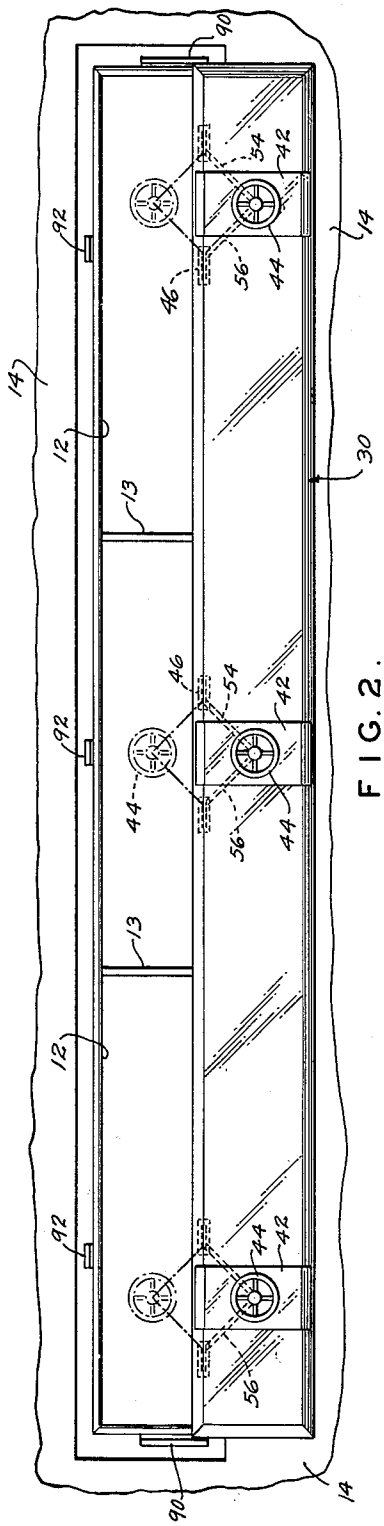


FIG. 2.

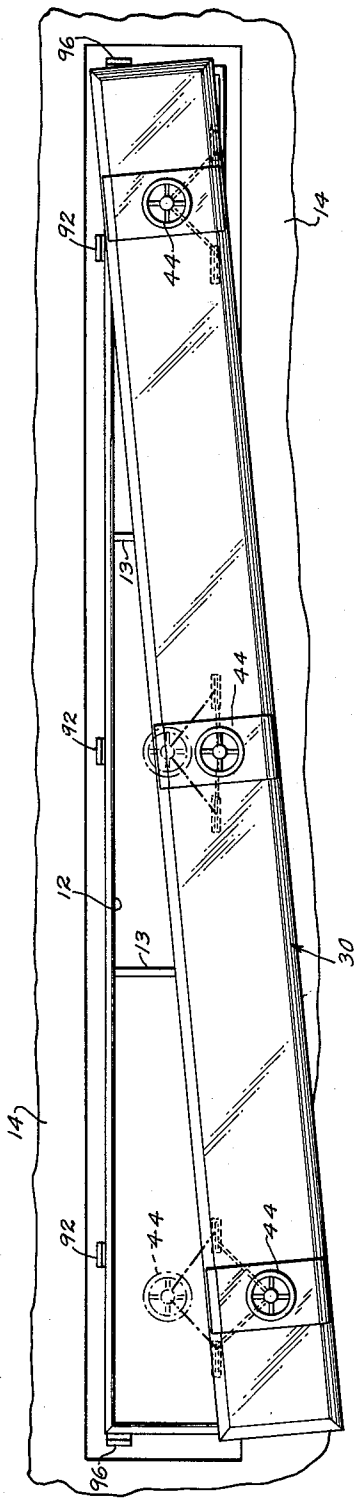


FIG. 7.

Nov. 3, 1964 J. L. CARNEY, JR 3,155,052

HATCH COVER FOR RAILWAY CARS

Filed May 29, 1963 3 Sheets-Sheet 3

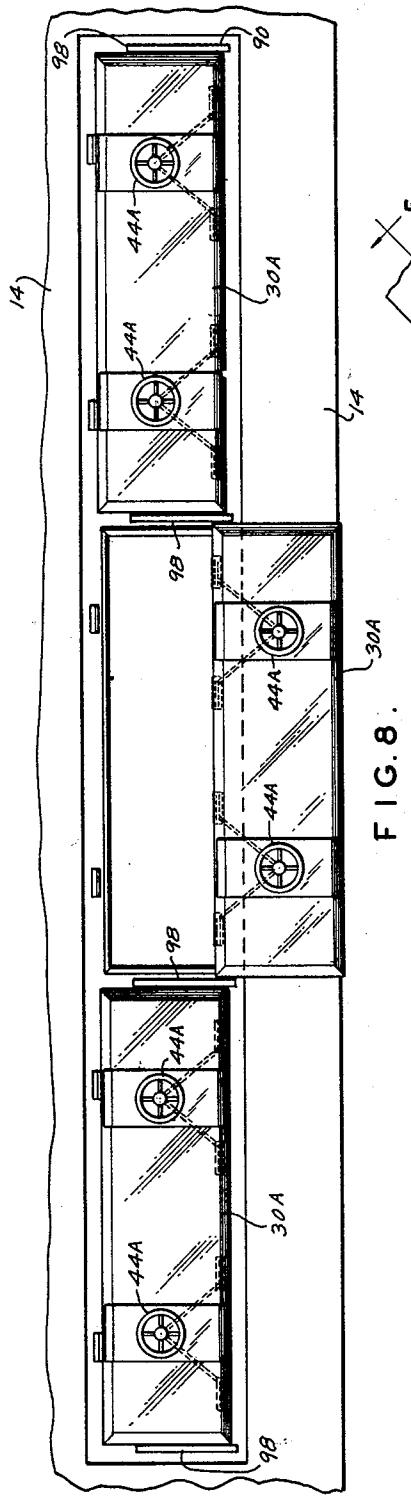


FIG. 8.

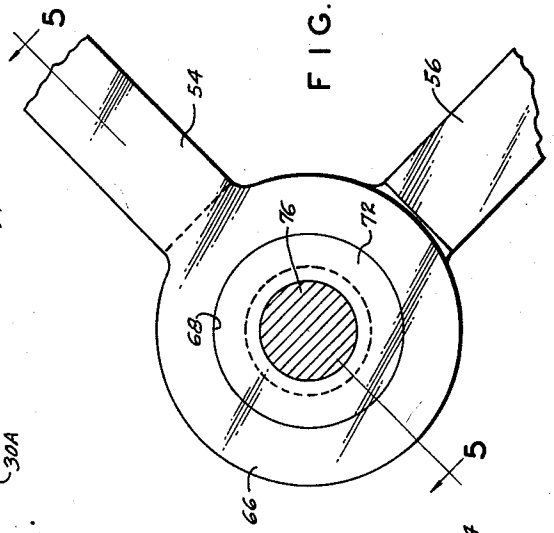


FIG. 4.

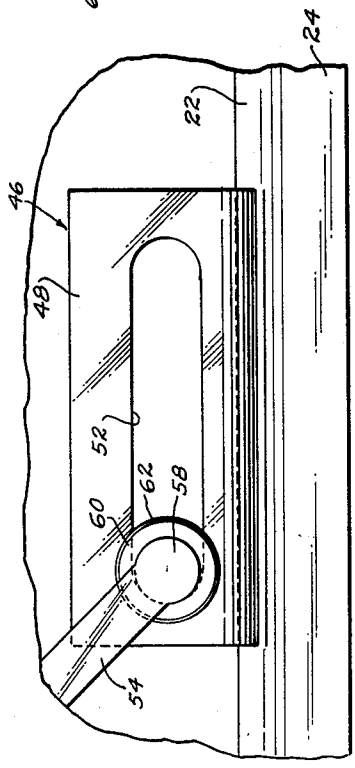


FIG. 6.

United States Patent Office 3,155,052 Patented Nov. 3, 1964

3,155,052

HATCH COVER FOR RAILWAY CARS

John L. Carney, Jr., St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y., a corporation of New Jersey

Filed May 29, 1963, Ser. No. 284,226
17 Claims. (Cl. 105—377)

This invention relates to hatch covers for railway cars and more particularly to such hatch covers for covering hatch openings in the roof of a railway car.

Heretofore, it has been common to provide a plurality of hatch covers along the length of the roof of a railway car, each hatch cover being spaced from the next successive hatch cover. The arrangement of hatch covers and associated hatch openings in such a manner requires a more or less exact positioning of a filling spout or other means for loading the car and does not permit a filling spout or the like to be moved longitudinally of the car in a continuous uninterrupted operation as the car is being filled.

Among the several objects of the present invention may be noted the provision of a hatch cover and associated hatch opening for the roof of a railway car which will permit the loading of a railway car in a continuous uninterrupted operation without the shut-off or stopping of the loading means until the car is filled or loaded, the filling of the car being effected in a minimum of time; the provision of such a hatch cover and associated hatch opening in which the hatch opening may be easily uncovered and the car filled in a manner to utilize the maximum amount of space within the car and to minimize pyramiding of the loaded material; and the provision of such a hatch cover and associated opening which is simple in operation and economical in construction. Other objects of this invention may be in part apparent and in part pointed out hereinafter.

Briefly described, this invention comprises an elongate hatch opening extending longitudinally along the roof of a railway car for substantially the entire length of the car of a compartment in the car, an elongate hatch cover fitting on a hatch frame surrounding the hatch opening, a generally vertically extending member adjacent each end of the elongate hatch cover on which the hatch cover is mounted for raising and lowering relative to the hatch opening, means operatively connected to the vertical extending members to raise and lower the hatch cover, and a pair of generally horizontally extending arms for supporting each vertical member, said arms having inner ends pivotally connected to the associated vertical member and outer ends mounted for movement back and forth longitudinally of the car upon the opening and closing of the cover, the arms moving from one side of a dead center position to the other side thereof in a toggle action upon the movement of the cover in a generally transverse direction away from the hatch opening for uncovering the opening, and upon movement of the cover back toward the hatch opening after the hatch opening has been uncovered. The uncovering of the hatch opening permits access to a compartment or compartments in the car along substantially their entire length and allows a substantially free uninterrupted movement of the loading means along the car. This arrangement tends to minimize the pyramiding of the material when being loaded and utilizes the maximum amount of space within the car. The hatch cover is mounted for movement generally transversely of the car in such a manner as to permit an opening and closing force to be applied at any position along the length of the elongate cover, the hatch cover being easily moved by a continuous push in one direction.

The invention accordingly comprises the constructions

hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings, in which several possible embodiments of the invention are illustrated,

FIGURE 1 is a perspective view of a railway car in accordance with one embodiment of this invention, an elongate hatch cover being mounted over an elongate hatch opening extending along the roof of a hopper car for substantially the entire length thereof;

FIGURE 2 is a plan view of the hatch cover of FIGURE 1, indicating the open position thereof;

FIGURE 3 is an enlarged section of the hatch cover taken generally along line 3—3 of FIGURE 1, the broken line position of the hatch cover showing the hatch cover raised from its lowered seated position shown in solid lines;

FIGURE 4 is an enlarged section taken generally along line 4—4 of FIGURE 3;

FIGURE 5 is a section taken generally along line 5—5 of FIGURE 4;

FIGURE 6 is an enlarged fragment of a certain mounting bracket for the hatch cover which permits the hatch cover to open and close;

FIGURE 7 is a plan of an embodiment of this invention in which the hatch cover is opened in a different manner from the embodiment of FIGURES 1–6; and

FIGURE 8 is a plan of another embodiment of this invention in which a separate hatch cover is provided for each compartment in a hopper car, the cover extending substantially the entire length of the associated compartment.

Referring now to the drawings, a hopper car generally designated C has a tubular tank-shaped body B supported adjacent each end on trucks T. Body B comprises a cylindrical tank shell L supported on side sills S. Shell L acts as a longitudinal beam and eliminates the necessity of a center sill, thereby to provide a smooth clean bore interior within shell L for facilitating the unloading and cleaning of the hopper car. It is to be understood that suitable bottom discharge openings (not shown) are provided for unloading the contents of the car.

Referring to FIGURE 3, the roof of the hopper car is indicated at 10 and a generally rectangular hatch opening 12 extends lengthwise of the roof in a continuous manner from a position adjacent one end of shell L to a position adjacent the other opposite end of shell L. Transverse partitions 13 (see FIGURE 2) divide the car into separate compartments. Opening 12 is arranged centrally of the width of the car which allows the car to be easily loaded from either side. Surrounding hatch opening 12 on the roof of the car is a horizontal plate 14 supported along its sides by struts 16 extending between plate 14 and a horizontal support angle 18. Plate 14 is supported adjacent its ends by posts 20 and constitutes a roof support platform on which workmen may stand.

Surrounding hatch opennig 12 along its perimeter is an upturned flange 22 formed from the side and end margins of the sheets or plates forming shell L adjacent hatch opening 12. A lip 24 on flange 22 is turned outwardly from flange 22 and forms a seat for a resilient gasket 28 secured by suitable means to the upper surface of lip 24. An elongate hatch cover generally designated 30 is generally rectangular in shape and is adapted to cover and uncover hatch opening 12. Hatch cover 30 comprises a flat body plate 32, having an integral downturned circumferential flange 34 sloping outwardly from the body plate. An outwardly flared seat portion 36 forms a seat 38 on its underside adapted to fit against resilient gasket 28 in sealing relation when hatch cover 30 is closed. A downturned circumferential lip or rim 40 of flange 34 overhangs gasket 28 to insure a water-

tight fitting. Cover stiffener plates 42 are welded at intervals along the length of hatch cover 30 to reinforce the cover where required.

To raise and lower hatch cover 30, and in accordance with one feature of the invention, hand wheels 44 are positioned along the length of cover 30 and upon being turned or rotated cover 30 is raised and lowered as will be explained. While the number of hand wheels will normally depend on the length of cover 30, it is to be understood that at least two hand wheels are normally required, one adjacent each end of the hatch cover. The mounting of each hand wheel 44 is identical and two mounting brackets generally designated 46 for each wheel 44 are welded to flange 22 (see FIGURES 2, 3 and 6). Each bracket 46 has a pair of inwardly extending legs 48. A support plate 50 between legs 48 is welded to legs 48 adjacent their free ends. Each leg 48 has an elongate slot 52 extending in a direction along the longitudinal axis of the car.

Mounted on each pair of brackets 46 are arms 54 and 56. Each arm 56, 54 has at its outer end an integral pivot pin 58 fitting in elongate slots 52 of bracket 46. An annular flange 60 on pin 58 seats on washer 62 and nut 64 secures pin 58 and its associated arm in position on bracket 46. The inner ends of arms 54 and 56 are pivoted to each other as will be explained. Arm 54 has an inner bifurcated end forming yoke arms 66 having openings 68 (FIGURES 4 and 5). Fitting between yoke arms 66 is an eye 70 on the inner end of arm 56. A sleeve 72 is secured, for example, by welding to yoke arms 66 and is threaded internally at 74. Openings 68 in arm 54 and eye 70 on arm 56 receive sleeve 72 as shown in FIGURE 5, arm 56 being free to pivot relative to sleeve 72 and arm 54.

Threaded within sleeve 72 is an externally threaded screw 76 for moving vertically relative to arms 54 and 56. Extending through the lower end of screw 76 is a pin 78 to limit the upward movement of screw 76. Integral with screw 76 is a reduced diameter unthreaded rod-like extension or projection 80 extending from the upper end of screw 76 through a portion of cover 30 and a stiffener plate 42 attached thereto. Hand wheel 44 has a hub 82 secured by a set pin 84 to projection 80. Rotation of hand wheel 44 turns projection 80 and integral screw 76 which constitute a vertically movable support member for hatch cover 30.

Hatch cover 30 has an opening loosely receiving upper end projection 80. Upper and lower wear plates 86 are secured respectively to stiffener 42 and flat plate 32 and likewise loosely receive reduced diameter end 80. A stiffener 42 is positioned beneath each hand wheel 44 through which projection 80 extends. Upper wear plate 86 bears against the lower end of hub 82 when the hatch cover is tightly closed and lower wear plate 86 bears against a washer 88 abutting screw 76 when the hatch cover is open or being raised. Hand wheel 44 and screw 76 constitute means to secure the hatch cover in position.

To guide the movement of the hatch cover and to position the hatch cover accurately with respect to the hatch opening, and in accordance with another feature of the invention, an angle 90 is secured to shell L adjacent each end of the hatch cover. Angles 92 are secured, such as by welding, to shell L adjacent one side of the hatch opening opposite mounting brackets 46. Rim 40 of hatch cover 30 abuts angles 92, as shown in FIGURE 3, when hatch cover 30 is drawn tight against gasket 28. Angles 90 direct the movement of cover 30 in a rectilinear or straight line direction transversely of the railway car.

As a specific example, hatch cover 30 may be formed of aluminum approximately ¼ inch in thickness and around 38 feet in length, the hand wheels being spaced around ten feet from each other. Each hand wheel 44 may be fully raised independently of the remaining hand wheels as the cover is normally moved only a distance of around three inches and has sufficient flexibility or resilience to allow such movement even though the remaining hand wheels are held fast. An operator thus only needs to turn each hand wheel once for raising and lowering the cover. The turning of a hand wheel rotates the associated screw 76 to raise screw 76 relative to arms 54 and 56. Washer 88 abuts wear plate 86 on cover 30 upon the raising of screw 76 and moves the cover therewith. After all the hand wheels have been raised, the cover is spaced from the hatch frame by between two and three inches and is then pushed away from the hatch opening by force applied along the side of the cover adjacent side guides 92. The end guides formed by angles 90 restrain movement of the hatch cover in any direction other than a rectilinear direction transversely of the longitudinal axis of the car. Upon movement of the cover from closed to open position pins 58 adjacent the outer ends of arms 54 and 56 move along slots 52 away from each other until arms 54 and 56 reach a dead center position at which the arms are parallel to the longitudinal axis of the car. Then, pins 58 move toward each other until they abut the inner edges of slots 52 at the fully open position of the cover. Arms 54, 56 thus form a toggle and move toward and away from a dead center position upon the opening and closing of hatch cover 30. As arms 54, 56 remain beneath cover 30 throughout the entire movement of the hatch, any interference of the arms or mounting brackets 46 with the loading means (not shown) is minimized. With the hatch opening uncovered, the car is filled or loaded with material in an uninterrupted continuous operation, the loading means, such as a filling spout, being positioned at any location along the length of the elongate hatch opening. After filling, the hatch cover is pushed against angles 92 which form side guides and the hand wheels are then drawn tight to lower and seat the hatch cover on gasket 28. The cover may be easily pushed transversely by force applied along any portion of the length of the side edge of the hatch cover.

It is to be understood that the hatch cover embodying the present invention, while illustrated on a hopper car, may be employed on any desired type of freight car having a roof and hatch opening for loading the car. Also, it is to be understood that two hatch covers 30 may be employed side-by-side, for example, such as might be desirable if a partition extends longitudinally of the railway-car.

Referring to FIGURE 7, hatch cover 30 is identical to the cover of FIGURES 1–6 except for the arrangement of the end guides. Angles 96 of a relatively small length are secured to shell L adjacent the ends of cover 30 and permit cover 30 to move in the manner shown in FIGURE 7 while aiding to position the hatch cover in its closed position. Movement of one end of the cover relative to the other opposite end may be desirable when only one end of the car is to be filled. The end guides may be removed, if desired, to permit an end of cover 30 to move relative to the other opposite end.

Referring to FIGURE 8, an embodiment of this invention is illustrated in which a hopper car is divided into three separate compartments arranged end-to-end, a separate hatch cover 30A for each compartment being provided. Each hatch cover 30A has a pair of hand wheels 44A mounted in a manner similar to hand wheels 44 of the embodiment of FIGURES 1–6. The provision of separate compartments with a separate hatch cover for each compartment permits selective opening and closing of the hatch openings, as well as the loading of different materials in each compartment. Guides 98 direct the movement of covers 30A transversely of the car.

It is to be understood that the hatch opening and hatch cover, while illustrated as being generally rectangular in shape, may be elliptical or some other desired elongate shape extending lengthwise in a direction generally parallel to the longitudinal axis of the car.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a railway car, a roof having an elongate hatch opening, an elongate hatch cover normally seated over the hatch opening for covering the opening, a generally vertically extending member adjacent each end of the elongate hatch cover on which the hatch cover is mounted for up and down movement relative to the hatch opening, means operatively connected to each vertically extending member to raise and lower the hatch cover, and a pair of generally horizontally extending arms beneath the hatch cover for supporting each vertical member, said arms having inner ends pivotally connected to the associated vertical member and outer ends mounted for back and forth movement, the arms adapted to move in a toggle action from one side of a dead center position to the other side thereof for opening and subsequently closing the hatch cover, the arms being generally parallel when in the dead center position.

2. In a railway car as set forth in claim 1, the means to raise and lower the hatch cover comprising a hand wheel operatively connected to each vertically extending member, the hand wheel effecting raising and unseating of the hatch cover when rotated in one direction and effecting lowering and seating of the hatch cover when rotated in an opposite direction.

3. In a railway car as set forth in claim 2, the vertically extending member connecting its associated arms for pivotal movement and being mounted for vertical movement relative to the arms, the hatch cover being supported on the vertical member for movement therewith, and the hand wheel being secured to its associated vertical member whereby upon rotation of the hand wheel the vertical member moves up and down to raise and lower the hatch cover.

4. In a railway car as set forth in claim 1, a hatch frame surrounding the hatch cover, a mounting bracket on the hatch frame for each arm and having an elongate slot therein extending longitudinally of the car, the outer ends of the respective arms being supported on the mounting brackets and mounted within the slots for movement in a direction longitudinally of the car.

5. In a railway car as set forth in claim 4, the arms adjacent one end of the hatch cover permitting movement of one end of the hatch cover relative to the other end thereof for uncovering one end of the elongate hatch opening.

6. In a railway car as set forth in claim 1, a guide for the hatch cover to restrain endwise movement of the cover and to direct the movement of the cover in a rectilinear path transversely of the longitudinal axis of the car.

7. In a railway car as set forth in claim 1, said roof having a plurality of elongate hatch openings arranged end-to-end longitudinally of the car, and a separate hatch cover for each of the hatch openings whereby opening and closing of selective hatch openings is permitted.

8. In a railway car, a roof having an elongate hatch opening extending longitudinally of the car, a hatch frame surrounding the hatch opening, an elongate hatch cover normally seated on the hatch frame to cover the opening, a vertically extending member adjacent each end of the elongate hatch cover on which the hatch cover is supported for movement relative to the hatch opening, a hand wheel connected to each vertically extending member to raise and lower the hatch cover, and a pair of generally horizontally extending arms pivotally connected to each vertically extending member beneath the

hatch cover for supporting its associated vertical member, a mounting bracket for each arm secured to the hatch frame and having an elongate slot therein extending longitudinally of the car, the inner ends of each pair of arms being pivotally connected to their associated vertically extending member and the outer ends of the arms being mounted in the slots of the associated mounting brackets for back and forth movement longitudinally of the car, the arms adapted to move in a toggle action from one side of a dead center position to the other side thereof for opening and subsequently closing the hatch cover, the arms being parallel to the longitudinal axis of the car when in the dead center position.

9. In a railway car as set forth in claim 8, a guide for the hatch cover to restrain endwise movement of the cover and to direct the movement of the cover in a rectilinear path transversely of the longitudinal axis of the car.

10. In a railway car set forth in claim 8, the arms adjacent one end of the hatch cover permitting movement of one end of the hatch cover relative to the other end thereof for uncovering one end of the elongate hatch opening.

11. In a railway car as set forth in claim 8, said roof having a plurality of elongate hatch openings arranged end-to-end longitudinally of the car, and a separate hatch cover for each of the hatch openings whereby opening and closing of selective hatch openings is permitted.

12. A railway car comprising a roof having an elongate opening extending longitudinally of the car, a hatch frame surrounding the hatch opening, an elongate hatch cover normally seated on the hatch frame to cover the opening, a pair of arms mounted on the hatch frame adjacent their outer ends and pivotally connected to each other adjacent their inner ends, the outer ends of the arms being mounted for back and forth movement relative to the hatch frame in a direction longitudinally of the car, a vertically movable member supported on said arms adjacent their inner ends and movable up and down relative to the arms when rotated, a hand wheel operatively connected to the movable member for moving the member up and down when turned, said hatch cover being supported on the vertical member and movable up and down therewith, a guide engaging the hatch cover to restrain endwise movement of the cover and to direct the movement of the cover in rectilinear path transversely of the car, the cover upon being pushed away from the hatch opening when unseated moving in a rectilinear path and moving the outer ends of the arms back and forth.

13. A railway car as set forth in claim 12 in which the vertically movable member comprises a screw, a sleeve threaded on the screw and secured to the arms, said hand wheel being secured to the screw and turning the screw when rotated thereby to move the screw and the cover up and down relative to the arms.

14. A railway car as set forth in claim 12 in which said hatch frame is formed from upturned marginal portions of the roof surrounding the hatch opening.

15. In a railway car, a roof having an elongate hatch opening extending longitudinally of the car, an elongate hatch cover normally seated over the hatch opening for covering the opening, a pair of arms supporting the hatch cover for movement between opened and closed positions and having inner ends pivotally connected to each other and supporting the hatch cover, mounting means for the arms adjacent the hatch opening and having an elongate slot construction extending in a direction longitudinally of the car, means mounting the cover to the inner ends of the arms for raising and lowering relative to the hatch opening, the outer ends of the arms being mounted in the slot construction for back and forth movement, the arms moving in a toggle action when the cover is opened from a position in which the outer ends of the arms are disposed in the slot construction at a minimum distance from each other to a dead center position in which the outer ends of

the arms are disposed in the slot construction at a maximum distance from each other, then past dead center position to the opened position of the hatch cover in which the outer ends of the arms are again disposed at a minimum distance from each other.

16. In a railway car as set forth in claim 15, a vertically extending member on the inner ends of the arms on which the hatch cover is mounted for up and down movement relative to the hatch opening, said means to raise and lower the hatch cover comprising a hand wheel operatively connected to the vertically extending member, the hand wheel effecting raising of the hatch cover when rotated in one direction and effecting lowering of the hatch cover when rotated in an opposite direction.

17. In a railway car as set forth in claim 15, a hatch frame surrounding the hatch opening, said mounting means comprising a mounting bracket for each arm secured to the hatch frame inwardly of the hatch opening and having an elongate slot extending in a direction longitudinally of the car, the slots in the brackets constituting the elongate slot construction.

No references cited.