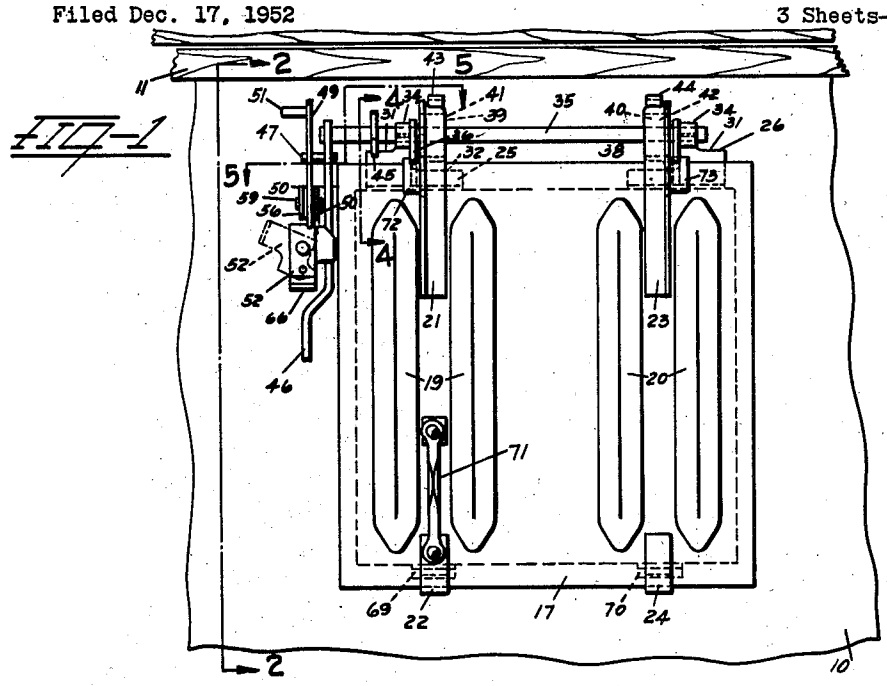
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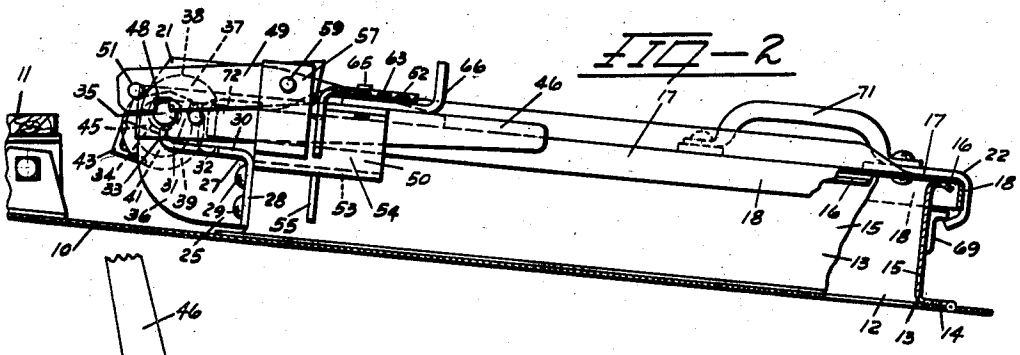
HATCH FRAME AND COVER FOR COVERED HOPPER CAR

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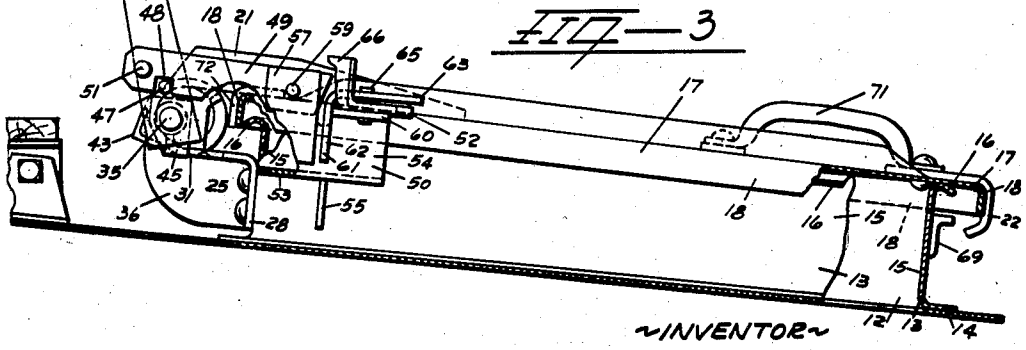
FIG—1



FIG—2



FIG—3



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FIG-4

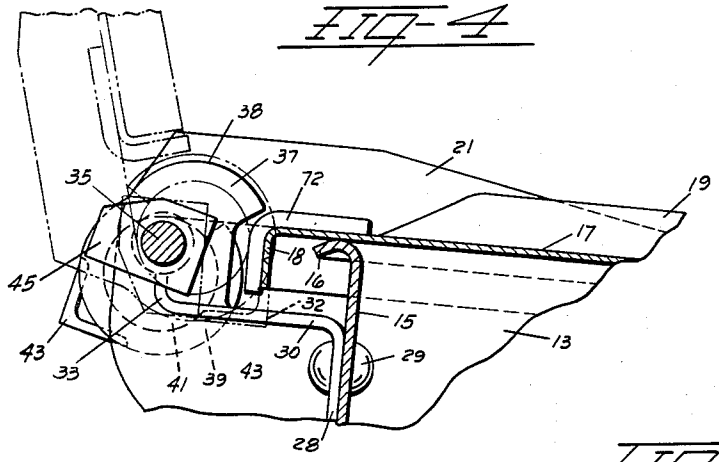


FIG-5

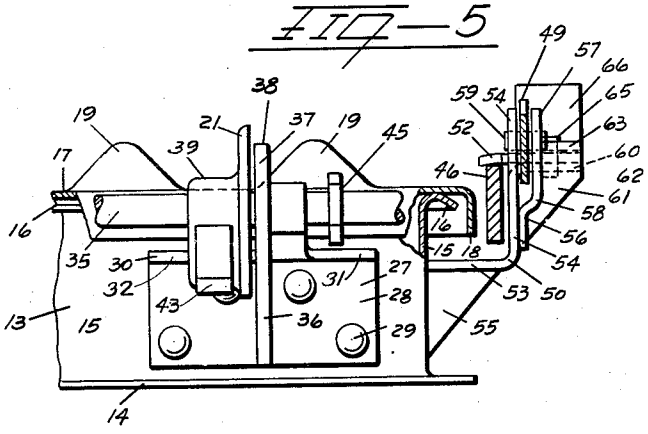
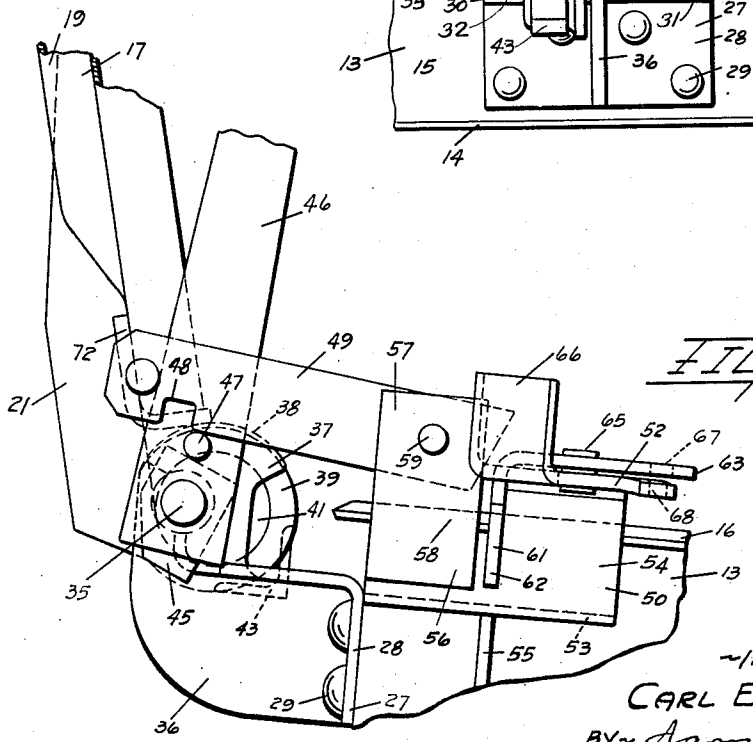


FIG-6

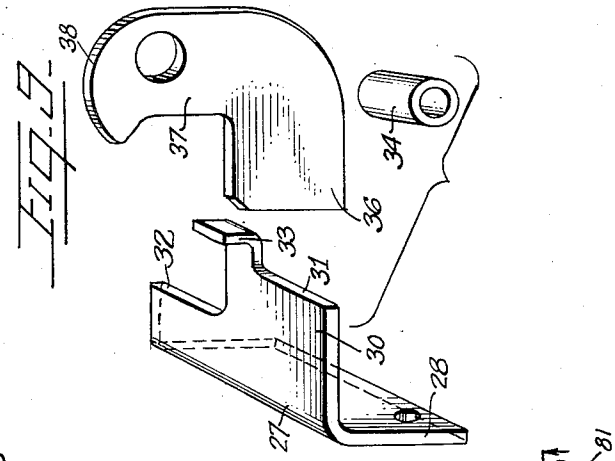


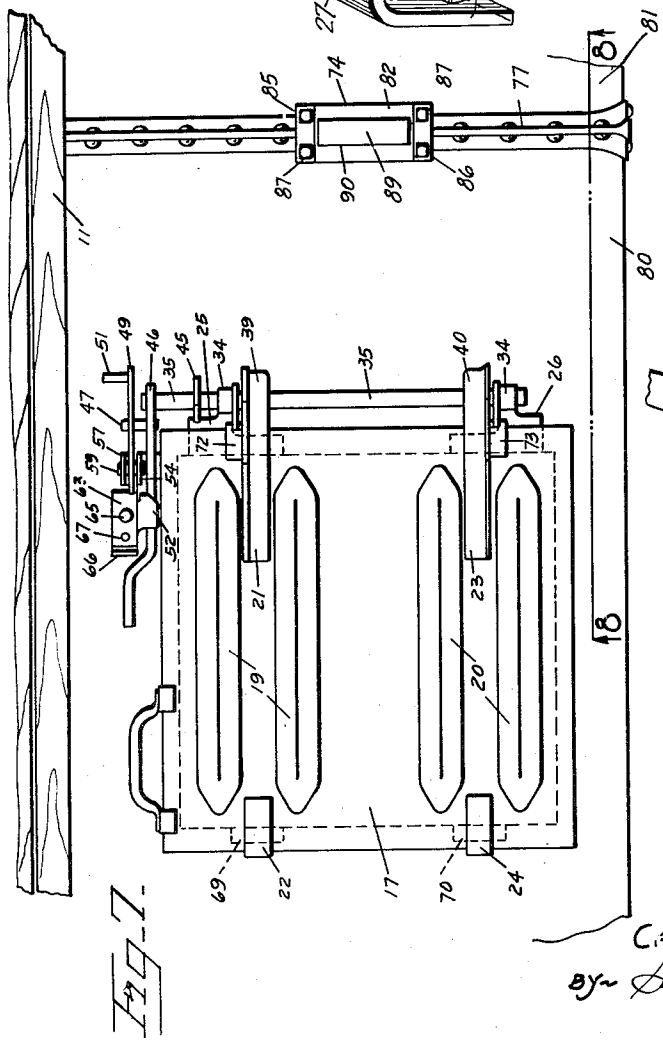
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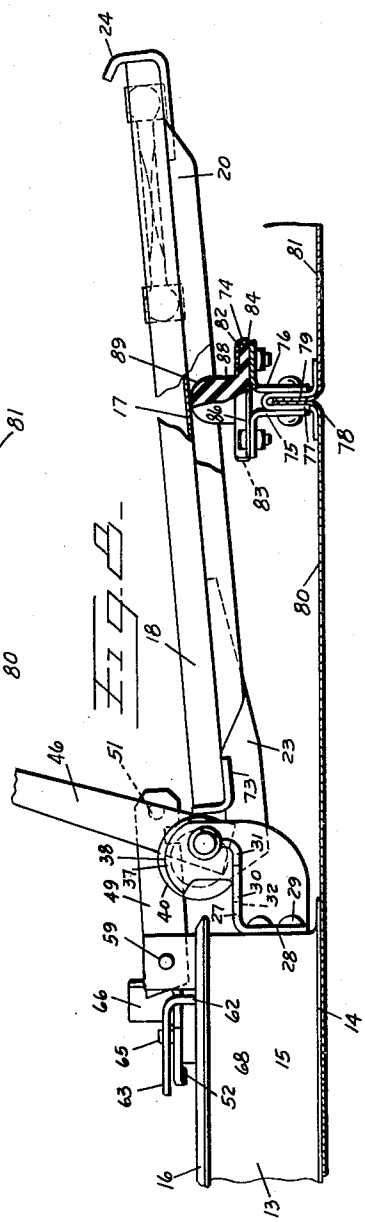
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HATCH FRAME AND COVER FOR COVERED HOPPER CAR

Filed Dec. 17, 1952 3 Sheets-Sheet 3







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United States Patent Office

2,837,040

Patented June 3, 1958

2,837,040

HATCH FRAME AND COVER FOR COVERED HOPPER CAR

Carl E. Johansson, Cleveland, Ohio, assignor to The Youngstown Steel Door Company, Cleveland, Ohio, a corporation of Ohio

Application December 17, 1952, Serial No. 326,490

3 Claims. (Cl. 105—377)

This invention relates to hatch frames and covers and more particularly to hatch frames and covers for covered hopper cars.

It is an object of this invention to provide structures of the kind indicated which shall effect a substantial reduction in the cost thereof.

A further object is to provide structures of the kind indicated which shall obviate the securement of the parts thereof other than the frame to the roofs of the cars.

A further object is to provide a unit hatch frame and cover for covered hopper cars which shall embody locking mechanism for the cover.

A further object is to provide hinged covers for hatch frames with reinforcements which shall not only stiffen the covers against distortion but shall serve as a tie between hinges and locking members secured upon the covers.

A further object is to provide hinged covers for hatch frames and locking mechanism for the covers so constructed and arranged as to render it impossible to close the covers incorrectly.

A further object of the invention is to provide a unit hatch frame, cover and cover locking mechanism for covered hopper cars capable of being opened longitudinally of the cars and be supported upon the roofs of the cars.

Other objects of the invention will become clear as the description thereof proceeds.

In the drawings forming part of this specification:

Fig. 1 is a fragmentary plan view of a roof of a covered hopper car having a unit hatch frame, transversely opening cover and locking mechanism embodying the instant invention and showing the latch for the actuating lever of the mechanism in retracted position in dot and dash lines.

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1 showing the cover locked, parts being broken away to more clearly illustrate the construction.

Fig. 3 is a view similar to Fig. 2 showing the cover unlocked, parts being broken away to more clearly show the construction.

Fig. 4 is a vertical section taken on line 4—4 of Fig. 1 showing the cover in open position in dot and dash lines.

Fig. 5 is a vertical section taken on line 5—5 of Fig. 1, parts being broken away for the sake of clarity.

Fig. 6 is a side view of a portion of the hatch frame and cover unit looking from the left in Fig. 1 and showing the feature of the invention which prevents improper closing of the cover.

Fig. 7 is a view similer to Fig. 1 showing a hatch frame and longitudinally opening cover unit embodying the instant invention.

Fig. 8 is a vertical section taken on line 8—8 of Fig. 7 showing the cover in open position and parts broken away to show the construction more clearly.

Fig. 9 is an exploded perspective of one of the bearing members for the hatch cover.

Referring first to the embodiment of the invention illustrated in Figures 1 to 6 of the drawings the numeral 10 designates generally the roof of a covered hopper car to which the instant invention is particularly applicable. The roofs of such cars are customarily provided with spaced hatch openings disposed on both sides of the running board 11. One of these hatch openings is shown at 12.

Secured to the roof around each hatch opening is a rectangular metallic frame 13 of well-known construction which embodies an outwardly extending flange 14 adapted to be seated upon and secured to the roof, an upwardly extending flange 15 and an outwardly and downwardly inclined flange 16 engaged by the cover 17 for the hatch frame when the cover is closed.

The hatch cover 17 is formed of a rectangular metallic plate provided with a depending peripheral flange 18. According to the instant invention the hatch cover has pairs of corrugations 19 and 20 positioned adjacent to the sides of the cover so as to extend transversely of the roof. A hinge strap 21 and a locking member 22 are secured upon the cover 17 in spaced relationship between the pair of corrugations 19. A hinge strap 23 and a locking member 24 are similarly secured between the pair of corrugations 20. Referring to Figure 1 of the drawings it will be seen that the hinge straps 21 and 23 extend inwardly of the adjacent ends of the pairs of corrugations and the locking members 22 and 24 extend inwardly of the opposite ends of the pairs of corrugations. By this construction the pairs of corrugations not only serve to strengthen the hatch cover but act as ties between the hinge straps and locking members and effect a saving of material.

The considered hatch cover is mounted upon the hatch frame 13 so as to be capable of movement of translation and transverse swinging movement. For this purpose members 25 and 26 are secured to the end of the hatch frame adjacent to the running board 11. The member 25 embodies a plate 27 bent into angular shape to provide a vertical flange 28 by means of which the plate is secured to the hatch frame as by means of rivets 29 and a horizontal flange 30. The flange 30 is coped to provide spaced abutments 31 and 32 which lie in offset planes for a purpose hereinafter appearing. Between the abutments 31 and 32 the flange 30 is turned upwardly to provide a flange 33 adapted to be welded to and support a hollow cylindrical member 34 in which a shaft 35 is journaled.

The member 25 also embodies a plate 36 welded in edgewise abutting engagement with the flange 28 and the underside of the portion of flange 30 which is coped to provide abutment 32. One side of plate 36 abuts the adjacent edge of upturned flange 33, the portion of flange 30 from which flange 33 extends and the cylindrical member 34 and is welded to these elements. Plate 36 is formed with an opening alined with the opening in the cylindrical member 34 so that the shaft 35 is also journalled in plate 36. The latter extends upwardly above flange 30 as indicated at 37 and is formed with a curved upper edge as shown at 38.

The member 26 is similar in construction to member 25 except that the abutments 31 and 32 extend oppositely to the abutments formed in bearing member 25. The description of member 25 will therefore suffice for the description of member 26.

The hinge straps 21 and 23, which are preferably made from angle members, are formed to provide eyes 39 and 40 which embrace similar cams 41 and 42 eccentrically mounted upon shaft 35. Angle stop members 43 and 44 are welded to the eyes 39 and 40 in opposed relationship to the abutments 32 and a plate stop member 45 is welded to shaft 35 in opposed relationship to abutment 31 of bearing member 25.

A lever 46 is welded to shaft 35 for the purpose of imparting rotation to the shaft. A short piece of round bar 47 is welded to and projects from the lever and is adapted to be seated automatically in an opening 48 formed in the underside of a latch 49 pivotally mounted upon a bracket 50 welded to a side of the hatch frame when the lever is swung to the desired vertical position. A short piece of round bar 51 welded to and projecting from latch 49 aids in disengaging the latch from the bar 47. When the cover is closed and locked upon the latch frame the lever is held against swinging movement by a latch 52 which is also pivotally mounted upon bracket 50 and swings horizontally.

As noted above bracket 50 is welded to the hatch frame and therefore is not fastened to the roof. Referring to Figs. 5 and 6, the bracket is shown as formed from a plate bent into an angle to provide a horizontal flange 53 and an upstanding flange 54. The edge of flange 53 is welded to the hatch frame and this flange is reinforced by a triangular plate 55 welded to the frame and the underside of the flange. An offset plate member 56 is welded to the portion of upstanding flange 54 adjacent to shaft 35 so that the portion 57 of this member above the offset 58 is spaced from the indicated portion of flange 54. The latch 49 is pivotally mounted in this space by means of a pin 59.

The portion of upstanding flange 54 remote from shaft 35 is bent outwardly and downwardly to provide a horizontal flange 60 spaced from the remaining portion of the upstanding flange. An angular plate member 61 formed with a substantially triangular vertical flange 62 and a substantially horizontal flange 63 is secured to the upstanding flange 54. This securement is obtained by welding an edge of the triangular flange 62 to flange 54 so that flange 63 lies above and in spaced relationship to flange 60. Triangular flange 62 which is alined with triangular plate 55, serves to reinforce flange 54, while the space between flanges 60 and 63 is adapted to receive a substantially horizontally swinging latch 52 pivotally mounted between the latter flanges by means of a vertical pin 65. The latch 52 is formed from a plate which is bent upward to provide a finger grip 66 for swinging the latch. Alined seal openings 67 and 68 are formed in flange 63 and the latch 52, respectively. When the cover is closed and locked and the lever is in substantially horizontal position the latch 52 is swung over the lever to hold it against upward swinging movement.

To open the hatch cover from its closed and locked position shown in Figure 1 the seal (not shown) is first removed and latch 52 swung from the position shown in full lines to the position shown in dot and dash lines. The latch is thereby disengaged from the lever 46 which is then swung toward the running board 11. During this movement of the lever the member 47 moves along the underside of latch 49 until opening 48 in the latch registers with member 47. Latch 49 then falls by gravity and member 47 is seated in opening 48 thereby preventing further movement of lever 46 and locking it in vertical position.

Operation of the lever as described imparts rotation of the shaft 35 and the stop member 45 and eccentric cams 41 and 42 secured upon the shaft. Stop member 45 is rotated from the full line position to the dot and dash line position as shown in Figure 4 where it engages abutment 31. This engagement insures against further swinging of lever 46 toward the running board in the event latch 49 is disengaged from member 47 of the lever and thereby prevents possible damage to the cover.

Rotation of the eccentric cams 41 and 42 within the eyes 39 and 40 of the hinge straps 21 and 23 produces a bodily shifting or motion of translation of the cover 17 upon the hatch frame 13 away from the running board, that is, from the position shown in Figure 2 to the position shown in Figure 3. This movement effects disengagement of the hook-shaped locking members 22 and 24 from the angular detents 69 and 70 secured to the hatch frames so that the cover may be swung by means of handle 71 about the cams 41 and 42 to open position. The movement of the cover is limited by the engagement of the angle stop members 43 and 44 with abutments 32.

To close the cover it is swung downwardly upon the hatch frame. Latch 49 is then disengaged from the lever which is also swung downwardly toward the roof. The rotation of the shaft and eccentric cams thereby produced causes the cover to shift bodily toward the running board and locking engagement between the locking hooks and angle detents occurs. The lever is locked by the latch 52 which is then sealed.

Since the cover moves bodily toward the running board when the lever is swung downward the cover can ordinarily be damaged if the proper procedure of closing the cover is not followed. Should the lever be swung downward before the cover is closed the resulting bodily movement of the cover relative to the hatch frame would so position the cover that upon subsequent closing thereof the edge of the cover remote from the running board would strike the frame and be damaged. The instant invention prevents such damage by insuring that the proper procedure is followed in closing the cover.

This is accomplished as follows. Assuming that the latch 49 has been disengaged from the lever and that it is attempted to swing the lever downward while the cover is still open it will be found that the eccentric action of the cams 41 and 42 within the eyes 39 and 40 of the hinge straps will produce a downward bodily movement of the cover so as to effect engagement between angular reinforcing members 72 and 73 secured to the edge of the cover adjacent to the running board and the curved upper edge 38 of the plates 36 of the bearing members 25 and 26. This engagement will prevent further movement of the lever and since the engagement can readily be seen the lever will be returned to its proper position and the cover first closed. Even if the door is forced downward to closed position after the described engagement occurs the free swinging edge of the cover will clear the hatch frame and damage to the cover will be avoided.

Figures 7 and 8 illustrate the invention applied to a hatch cover which swings longitudinally of the roof and is adapted to be supported upon the roof so that the projection of the cover above the roof is held to a minimum. The structure of the invention hereinabove described is here utilized with the exception that the angle stop members 43 and 44 are omitted to permit the cover to assume the position shown in Figure 8 when the cover is open. The same safeguards above described are employed in the considered embodiment of the invention.

In order to prevent damage to the cover and the roof when the cover is opened a resilient stop member 74 is provided. This member embodies angle brackets 75 and 76 secured upon the opposite sides of the carline roof cap 77 which extends from eaves to eaves of the roof and embraces the adjacent upstanding flanges 78 and 79 of the roof sheets 80 and 81. A metallic plate member 82 having vertical depending side flanges 83 and 84 and horizontal end attaching flanges 85 and 86 are secured to the angle brackets 75 and 76 as by means of bolts 87. A rubber bumper 88 is disposed between the angle brackets and member 82. A portion 89 of the bumper projects upwardly through an opening 90 in the plate member 82 to engage and support the cover when it is opened.

It will be seen from the foregoing description that in both embodiments the instant invention provides a complete unit of hatch frame, cover and locking mechanism so that it is only necessary to secure the hatch frame upon the roof to effect securement of the entire structure.

It will be apparent that numerous changes and modifications in the details of the invention will be clear to those skilled in the art. It is intended, therefore, that all

such changes and modifications be comprehended within this invention which is to be limited only by the scope of the claims appended hereto.

I claim:

1. In a railway car having a roof, a hatch opening in said roof, a hatch frame secured to said roof around said opening, a cover for said frame, shaft supporting members secured to said frame, a shaft journalled in said members, cams eccentrically mounted on said shaft, hinge straps secured to said cover, collars on said straps encircling said cams, a lever secured to said shaft for imparting rotation thereto, and cooperating means on said cover and frame for locking said cover upon said frame, said lever being swingable in one direction to effect automatic disengagement of said cooperating locking means and permit swinging movement of said cover to open position about said cams, engaging means on said cover and engaging means on said shaft supporting members, said latter two means being engaged to limit swinging movement of said lever in the opposite direction when said lever is swung in said opposite direction prior to closing movement of said cover.

2. In a railway car having a roof, a hatch opening in said roof, a hatch frame secured to said roof around said opening, a cover for said frame, shaft supporting members secured to said frame, extensions on said shaft supporting members, a shaft journalled in said members, cams eccentrically mounted on said shaft, hinge straps secured to said cover, collars on said straps encircling said cams, a lever secured to said shaft for imparting rotation thereto, and cooperating means on said cover and frame for locking said cover upon said frame, said lever being swingable in one direction to effect automatic disengagement of said cooperating locking means and permit swinging movement of said cover to open position about said cams, said cover having angle members, said angle members engaging said extensions to limit swinging movement of said lever in the opposite direction when said lever is swung in said opposite direction prior to closing movement of said cover.

3. A unit hatch frame, cover and locking mechanism for roofs of covered hopper cars comprising a hatch frame, shaft supporting members carried by said frame, a shaft journalled in said members, a lever mounted upon said shaft and operable to impart rotation thereto, a stop member on said lever, cams eccentrically secured on said shaft, a cover for said frame, hinge straps secured to said cover, said hinge straps having collars encircling said cams, cooperating means on said cover and said hatch frame for locking said cover upon said frame, said lever being swingable in one direction to effect automatic disengagement of said cooperating locking means and permit swinging movement of said cover to open position about said cams, engaging means on said cover and engaging means on said shaft supporting members, said latter two means being engaged to limit swinging movement of said lever in the opposite direction when said lever is swung in said opposite direction prior to closing movement of said cover means carried by said frame for locking said lever when said cover is locked, a latch carried by said frame, said latch automatically engaging said stop member on said lever when said lever is actuated away from said frame and preventing further actuation of said lever toward and away from said frame, and a stop member secured to and rotatable with said shaft, said stop member engaging one of said shaft supporting members to prevent actuation of said lever away from said frame upon release of said latch from said stop member on said lever.

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