Feb. 11, 1941. V. E. WEST 2,231,175

HATCH CONSTRUCTION

Filed April 19, 1940

Fig. 1.

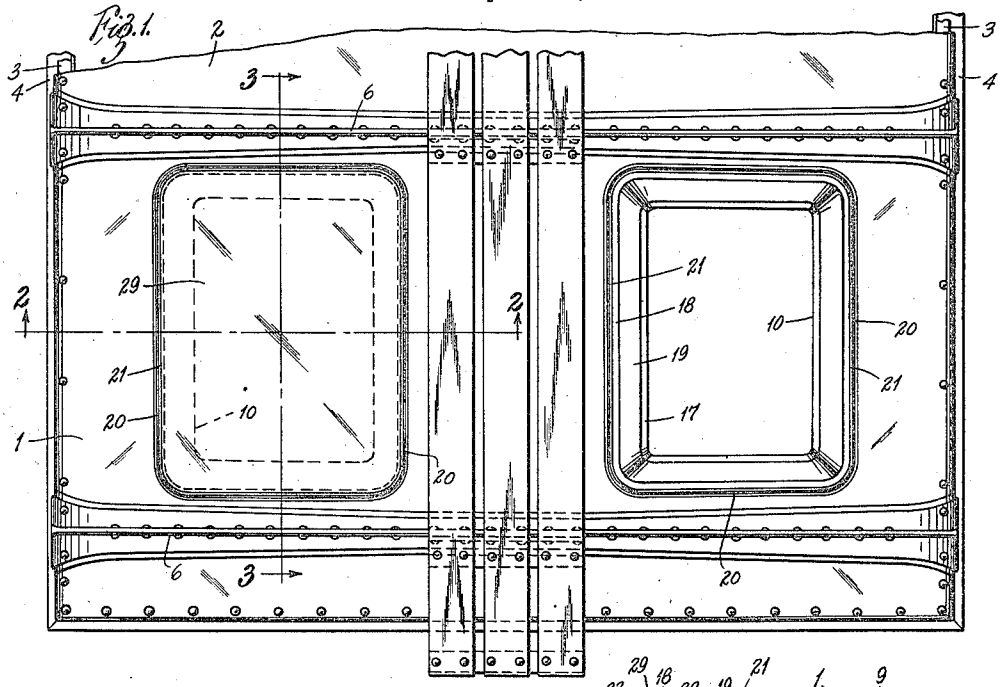


Fig. 2.

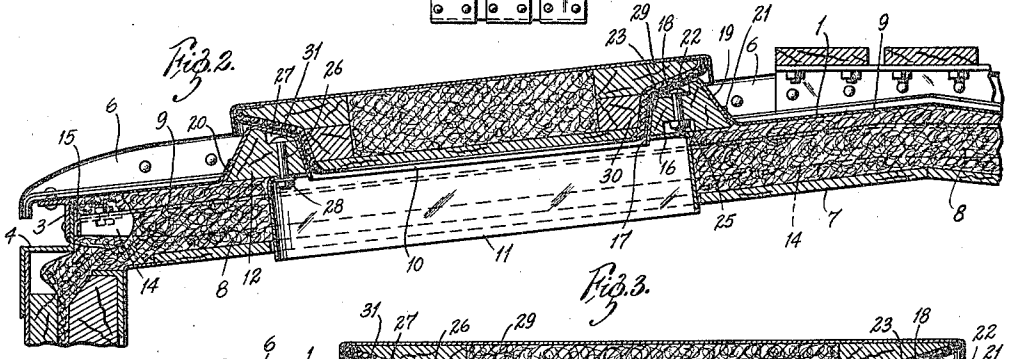


Fig. 3.

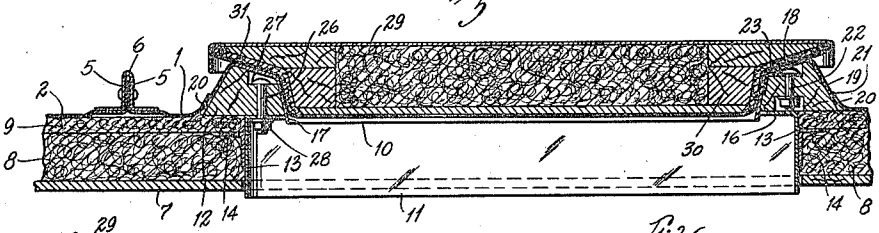


Fig. 4.

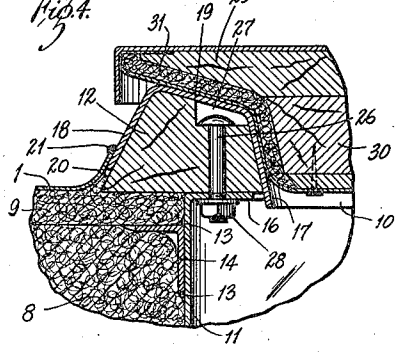


Fig. 5.

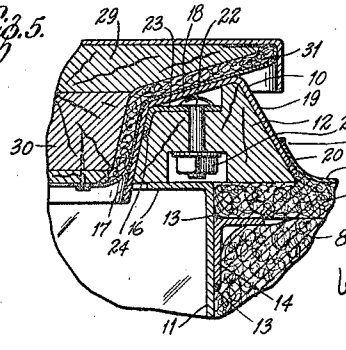
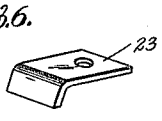


Fig. 6.



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2,231,175

# UNITED STATES PATENT OFFICE

2,231,175

## HATCH CONSTRUCTION

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Application April 19, 1940, Serial No. 330,488

13 Claims. (Cl. 108—5.4)

This invention relates to the hatch construction of a railway car, particularly to the hatch construction of an insulated car roof. The principal object of the present invention is to devise a simple and economical, strong and durable weatherproof hatch construction that will reduce the transfer of heat through and around the metal hatch frame, to provide for the quick and easy assembly of said construction and to obtain other advantages hereinafter appearing. The invention consists in the insulated hatch construction and in the parts and in the combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawing, which forms part of this specification and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is a plan view of an end portion of a metal refrigerator car roof provided with a hatch construction embodying my invention,

Fig. 2 is an enlarged vertical transverse section through one-half of the roof at one of the hatchways on the line 2—2 in Fig. 1,

Fig. 3 is an enlarged vertical partial longitudinal section through the roof at said hatchway on the line 3—3 in Fig. 1,

Fig. 4 is an enlarged fragmentary section, similar to Fig. 3, through one side of said hatch construction,

Fig. 5 is a similar section through the opposite side of said hatch construction; and

Fig. 6 is a perspective view of one of the anchoring clips for the securing bolts for the wooden filler for the hollow rim section of the hatch frame.

In the accompanying drawing, my invention is shown embodied in a metal refrigerator car roof comprising an end roof sheet 1 and an intermediate roof sheet 2 that have their eaves end portions supported on and secured to eaves angles 3 that are fixed to the side plates 4 of the car. Said end and intermediate roof sheets are provided along their adjacent margins with upstanding seam flanges 5 that are covered and rigidly secured together by a seam cap 6. The metal roof is provided with a thermal insulation comprising ceiling 7, a relatively thick layer 8 of insulating material supported on said ceiling and a relatively thin layer 9 of such material filling the space between said thick layer and the underside of said roof.

The car has one or more hatch openings which lead downwardly through the roof between the ridge and eaves thereof into the interior of the car. Each hatch opening is defined by a hatch frame comprising a metal upper section 10 that extends above the general level of the metal roof, a metal lower section 11 disposed below said level and an intermediate or connecting section 12 of wood or other rigid thermal insulating material, all in the form of open rectangular frames. The metal lower section 11 of the hatch frame is interposed between and welded or otherwise rigidly secured, as at 13, flatwise to the opposing sides of two spaced parallel metal frame or carline members 14 so as to form a rigid cross-connection therebetween. The carline members 14 extend transversely of the car from side plate to side plate thereof with their ends secured to brackets 15 fixed to the side plates 4. As shown in the drawing, the carline members 14 are of angular section with one flange down and with the other flange up and facing outwardly and spaced below the metal roof. The lower hatch frame section extends above and below the carline members 14 and terminates at its upper end in a continuous inwardly extending flange 16 disposed substantially in the plane of the underside of the metal roof.

The metal upper section 10 of the hatch frame is of substantially inverted channel-shaped cross-section; that is, said section comprises downwardly diverging inner and outer side walls or flanges 17 and 18, respectively, connected by a top or web 19 that inclines inwardly and downwardly. The inner side wall 17 of the downwardly opening hollow upper section 10 of the hatch frame extends downwardly a short distance through the opening defined by the inturned top flange 16 of the lower section 11 of said frame and are clear of the free edge of said flange. As shown in the drawing, the hollow upper section 10 of the hatch frame is located in an opening provided therefor in the end or hatch sheet 1 of the metal roof; and said sheet has an upstanding flange 20 around said opening that bears flatwise against the outer face of the depending outer side wall of said section and is rigidly secured thereto preferably by means of a continuous edge weld 21 to form a rigid weatherproof joint therebetween. Thus the rim section 10 of the hatch frame cooperates with the roof sheet to form a hollow upstanding rib on the roof around the upper end of the hatch opening defined by said frame.

The wooden section 12 of the hatch frame is shaped to snugly fit within the hollow upper section 10 of said frame and thus serves as a heat insulating, strengthening and stiffening filler for said hollow section. This wooden filler sec-

tion is secured within the hollow metal upper section 10 of the hatch frame for attachment to and removal from the roof with said upper section as a unit. This filler securing means preferably comprises a series of bolts 22 that are supported by metal clips 23 that are located inside the hollow upper section 10 and are welded or otherwise rigidly secured, as at 24, to the inner side wall 17 thereof and project laterally from said wall at about the level of the juncture thereof with the web or top portion 19 of said section. The bolts 22 have their heads supported on the metal attaching clips 23 and extend downwardly through registering holes provided therefor in said clips and in the filler section and are provided at their lower ends with countersunk nuts 25. The insulating filler section 12 of the hatch frame has a flat bottom that seats on and is supported by the inturned top flange 16 of the lower section 11 of said frame; and said filler section is rigidly secured to said top flange preferably by means of bolts 26 that extend downwardly through registering openings provided therefor in said filler and flange. The heads of the bolts 26 seat in recesses or depressions 27 provided therefor in the filler section 12 at the upper ends of the bolt holes therein; and said bolts are provided below the inturned top flange 16 of the lower hatch frame section 11 with nuts 28, which, when tightened, operate to clamp said filler section tightly against said top flange of said lower section.

The hatch frame is provided with an insulated closure comprising a cover portion 29, which seats on the top 19 of the upper hatch frame section 10, and a tapered plug portion 30 that fits within said section. The edges of said cover and plug portions are provided with a compressible gasket or pad 31 which seats against the top and inner side wall of said upper section.

As shown in the drawing, the relatively thick layer 8 of insulation is substantially continuous from side to side and end to end of the car, except for the regions occupied by the lower hatch frame section 11 and its supporting members 14, and is spaced below the metal roof with the upper surface of said insulation disposed substantially flush with the tops of said supporting members 14; and the space between said insulation and said metal roof is filled with the thin layer 9 of insulation which extends over the top flanges of said supporting members and is substantially continuous from side to side and end to end of the car except for the cutout therein for the upper end of said lower hatch frame section.

By the arrangement described, the metal upper and lower sections of the metal hatch frame are separated by the wooden filler section interposed therebetween, thereby preventing the transfer of heat by conduction through one metal section to the other. The wooden filler also serves to connect the two metal hatch frame sections and to stiffen and strengthen the hollow upper section. The upper and lower layers of insulation snugly fit around the lower hatch frame section while the upper layer extends beneath the wooden filler section of the hatch frame and overlaps the top flanges of the metal carline members, thus reducing the transfer of heat through roof and around said hatch frame. The lower section of the hatch frame is wider than the upper section thereof thus providing more space below the upper section for icing. The two carline or frame members, with the lower hatch frame secured thereto are secured as a unit to the car. The upper insulation is then packed and cleated around the lower flange. The upper hatch frame section, with the wooded filler section bolted therein is then secured to the top flange of the lower hatch frame section by means of the bolts already mounted in the filler, and the metal roof is then applied and the flanges around the hatch opening in the roof are secured to the outer wall of the rim section by means of the edge weld. When worn or damaged, the upper section may be quickly and easily removed and replaced without disturbing the insulation or the lower section and its supporting members.

What I claim is:

1. In a car roof having a hatch opening, a hatch frame for said opening comprising metallic upper and lower sections and a non-metallic intermediate section separating said metallic upper and lower sections, and separate means for securing said non-metallic section to the respective upper and lower metallic sections.

2. In a car roof having a hatch opening, a hatch frame for said opening comprising metal upper and lower sections and an intermediate thermal insulating section interposed therebetween, means for securing said intermediate section to said upper section, and means for securing said intermediate section to said lower section.

3. In a car roof having a hatch opening, a hatch frame for said opening comprising a metal upper section, a metal lower section and an intermediate section of rigid thermal insulating material interposed therebetween, means for detachably securing said intermediate section to said lower section, and means for securing said intermediate section to said upper section whereby said intermediate section is attachable to and detachable from said lower section with said upper section as a unit.

4. In a car roof having a hatch opening, a hatch frame for said opening comprising a metal lower section, a wooden intermediate section supported on and detachably secured to said lower section and a metal upper section supported on and detachably secured to said intermediate section clear of said lower section.

5. In a car roof having a hatch opening, a hatch frame for said opening comprising a metal lower section, a metal upper section of substantially inverted channel-shaped section and a non-metallic filler section fitting within and secured to said upper section, and means for securing said filler section to the upper end of said lower section.

6. In a car roof having a hatch opening, a hatch frame for said opening comprising a metal lower section, a metal upper section of substantially inverted channel-shaped section and a wooden filler fitting within and secured to said upper section, and means for securing said filler to the upper end of said lower section, said last mentioned means comprising bolts carried by said filler and engaging said lower section.

7. In a car roof having a hatch opening, a hatch frame for said opening comprising a metal lower section with a lateral flange at the top thereof, a metal upper section of substantially inverted channel-shaped cross section and a wooden filler fitting within said upper section and seating on said lateral top flange of said lower section, a series of fasteners for securing said filler section to said upper section, and a series of fasteners carried by said filler section for securing the latter to said lateral top flange of said lower section, the inner side wall of said upper

section extending downwardly through but clear of the upper end of said lower section.

8. In a car roof having a hatch opening, a hatch frame for said opening comprising a metal lower section with an inwardly extending flange at the top thereof, a hollow downwardly opening metal upper section, and a wooden filler fitting within said hollow upper section and seating on said lateral top flange of said lower section, a series of bolts for securing said filler within said hollow upper section, a series of bolts anchored in said filler and extending downwardly through said filler and said lateral top flange of said lower section, and nuts on said last mentioned bolts below said lateral top flange of said lower section, said downwardly opening hollow upper section having an inner side wall extending downwardly through but clear of the opening defined by the inwardly extending top flange of said lower section.

9. In a car roof having a hatch opening, a hatch frame for said opening comprising a lower metal section with an inwardly extending top flange, a metal upper section of substantially inverted channel-shaped cross section with downwardly diverging side walls and a wooden filler fitting within said inverted channel-shaped upper section and seating upon said top flange of said lower section, metal clips fixed to and projecting from one side wall of said upper section inside thereof, bolts for securing said filler to said clips, bolts carried by said filler section for securing the latter to the top flange of said lower section, and means for securing said outer side wall of said upper section to said roof around the hatch opening therein.

10. In a car roof having a hatch opening, a hatch frame for said opening comprising a lower metal section with an inwardly extending top flange, a metal upper section of substantially inverted channel-shaped cross section with downwardly diverging side walls, and a wooden filler fitting within said inverted channel-shaped upper section and seating upon said top flange of said lower section, metal clips fixed to and projecting from one side wall of said upper section inside thereof, bolts for securing said filler to said clips, bolts carried by said filler section for securing the latter to the top flange of said lower section, and means for securing said outer side wall of said upper section to said roof around the hatch opening therein, said second mentioned bolts having heads at their upper ends supported in recesses provided therefor in the top of said filler and having nuts at their lower ends cooperating with the underside of said flange.

11. In a car roof having a hatch opening, a hatch frame for said opening comprising a lower metal section, a metal upper section and a non-metallic intermediate section interposed between and secured to the respective upper and lower sections, frame members secured to opposite sides of said lower section below the top thereof, and insulation extending between said frame members and said roof and snugly fitting around said lower section above said frame members.

12. In a metal car roof having a hatch opening, a hatch frame for said opening comprising a metal lower section, a hollow downwardly opening metal upper section and a non-metallic filler fitting within and secured to said hollow upper section, means for securing said filler section to said lower section, frame members secured to opposite sides of said lower section below the top thereof, and insulation overlapping said frame members and snugly fitting around said lower section above said frame members.

13. In a car roof having a hatch opening, a hatch frame for said opening comprising a lower metal section with an inwardly extending top flange, a metal upper section of substantially inverted channel-shaped cross section with downwardly diverging side walls, and a wooden filler fitting within said inverted channel-shaped upper section and seating upon said top flange of said lower section, bolts for securing said filler section to said upper section, bolts carried by said filler section for securing the latter to the top flange of said lower section, means for securing said outer side wall of said upper section to said roof around the hatch opening therein, frame members secured to opposite sides of said lower section below the top thereof and insulation extending between said frame members and said roof and snugly fitting around said lower section above said frame members.

VICTOR E. WEST.