March 1, 1966 A. G. DEAN 3,237,573

RAILWAY CAR ROOF DRAINAGE SYSTEM

Filed Feb. 24, 1964 2 Sheets-Sheet 1

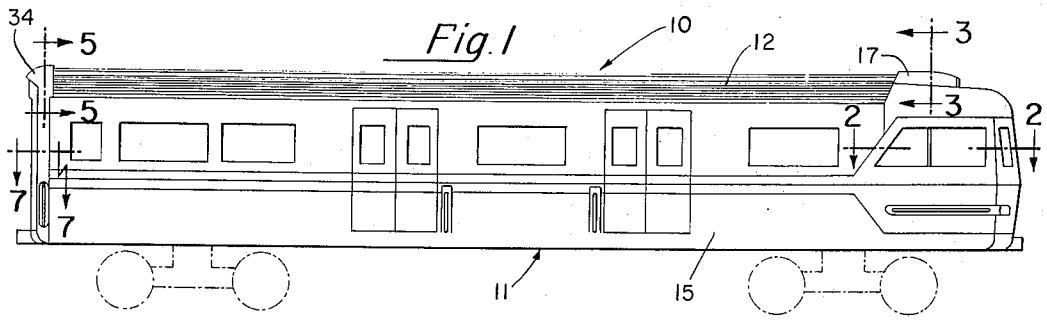

Fig. 1

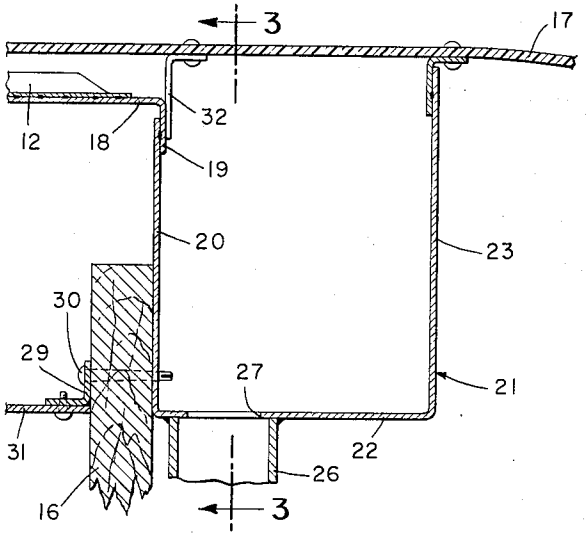

Fig. 4

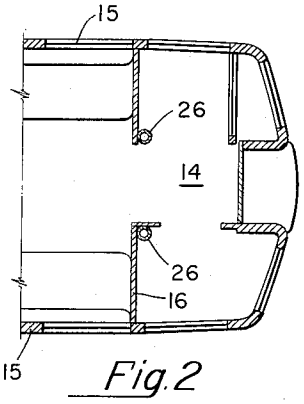

Fig. 2

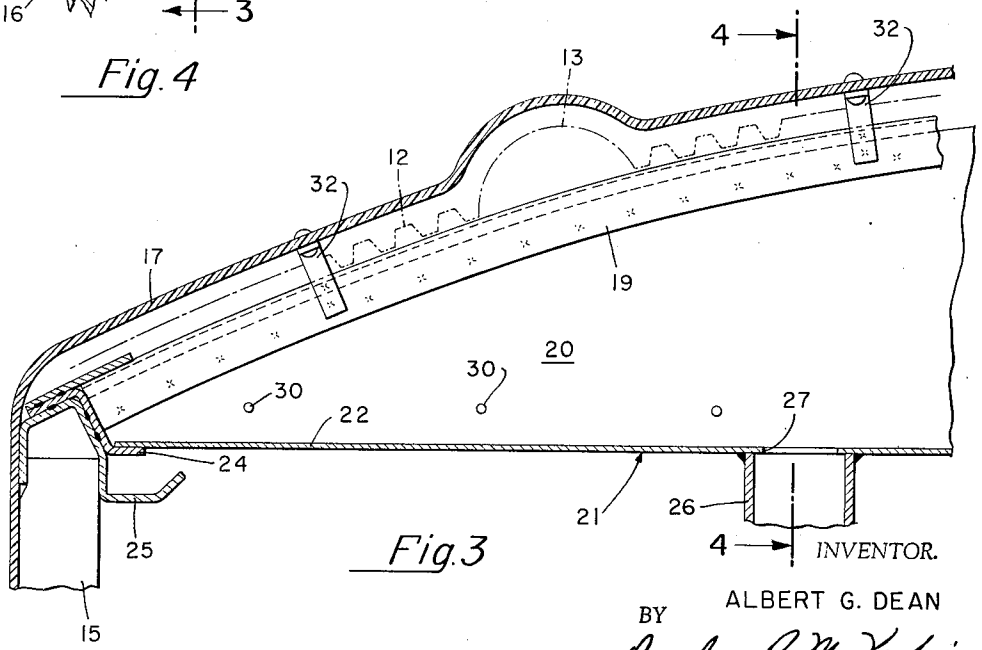

Fig. 3

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RAILWAY CAR ROOF DRAINAGE SYSTEM

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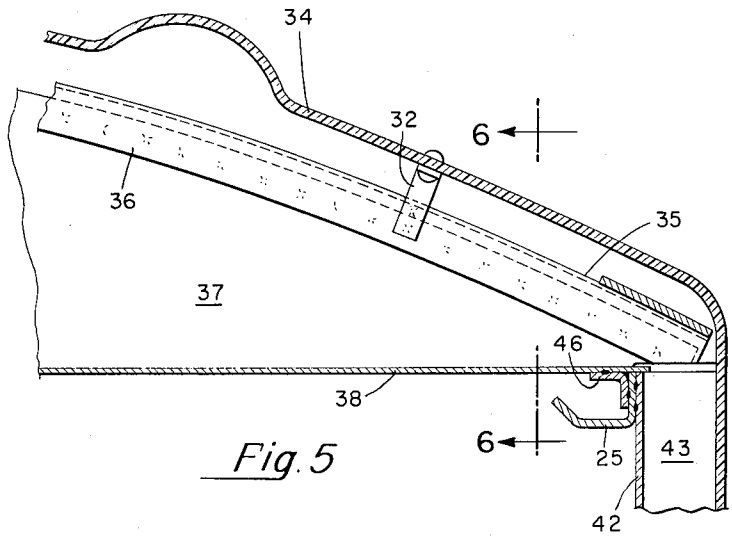

Fig. 5

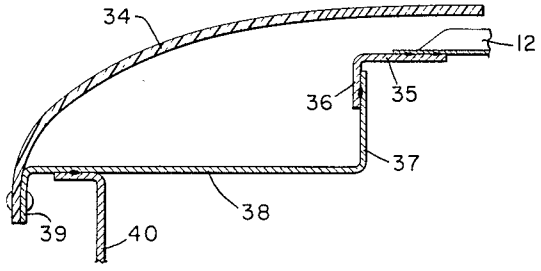

Fig. 6

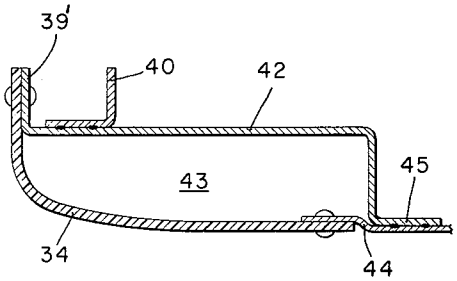

Fig. 7

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3,237,573

RAILWAY CAR ROOF DRAINAGE SYSTEM

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6 Claims. (Cl. 105—397)

This invention relates to railway cars and, more particularly, to a drainage system for draining water from the roof of the car.

In railway cars provided with corrugated roofs having longitudinal corrugations, the corrugations and purlines, if any, entrap water resulting from a rainstorm or from a car washing operation. During rapid acceleration and deceleration, the entrapped water flows along the roof and spills off its ends. In self-propelled, platform-loading, rapid transit cars, this phenomena can be troublesome since the water from the roofs can splash against adjacent cars and then onto people standing on the platform. During deceleration, as a car or train comes into a station, water flowing along the roof and spilling off the front end of the lead car is additionally troublesome since it can be blown back into the motorman's face if he is looking out of a window.

Accordingly, one of the objects of the invention is to provide a novel drainage system for a railway car body that overcomes the above mentioned problems.

Another object of the invention is to provide a drainage system for draining water entrapped on a roof, the system comprising a plurality of transverse troughs and vertical downspouts that drain water interiorly of the outer shell of the car.

Still another object is to provide a drainage system having a plurality of draining members which, in addition to serving or providing a drainage function, act as structural members for strengthening the car body.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the the accompanying drawings wherein:

FIG. 1 is a side elevational view of a railway car embodying the invention;

FIG. 2 is a horizontal sectional view, taken along lines 2—2 of FIG. 1, of a detail of the car;

FIG. 3 is a transverse, vertical sectional view along lines 3—3 of FIGS. 1 and 4;

FIG. 4 is a longitudinal, vertical sectional view along lines 4—4 of FIG. 3;

FIG. 5 is a view similar to FIG. 3 of the drainage system at the other end of the car, FIG. 5 being taken along lines 5—5 of FIG. 1;

FIG. 6 is a longitudinal vertical sectional view taken along lines 6—6 of FIG. 5; and

FIG. 7 is a horizontal sectional view taken along lines 7—7 of FIG. 1.

Referring now to the drawings there is shown a self-propelled, platform-loading, rapid transit car **10** having a car body **11** provided with a room **12**. The roof has longitudinal corrugations and purlines **13**. At its lead end, car **10** has a motorman's cab **14** extending between the front ends of sidewalls **15** and separated from the passenger space by a partition **16** having a longitudinal aisle opening.

A plastic hood **17** covers the front upper portion of body **11** and, in addition to its function in the drainage system, serves as ornamentation in the car design. Hood **17** is spaced above and overhangs the front end of roof **12** so that water flowing along the roof flows beneath the hood. The front end of roof **12** is welded to a transversely extending arcuate plate **18** having a down-turned flange **19** at its front end which overlaps and is welded to the rear upstanding wall **20** of a transverse,

horizontal trough **21**. Trough **21** further includes a horizontal, bottom wall **22** and a front vertical wall **23**, spaced in front of the rear wall, the front and rear walls having arcuate upward edges conforming to the curvature of the roof and of the hood. Wall **23** has, at its upper edge, an arcuate angle member connected to the hood whereby the hood and wall **23** act as baffles to collect all the water flowing off the roof and direct such water into the trough. Each side of trough **21** is supported on and connected to a longitudinal rail **24** of the roof, rail **24** being supported on and connected to the top rail **25** of a sidewall **15**.

A pair of transversely-spaced, vertical downspouts **26** have their upper ends welded to bottom wall **22** beneath holes **27** therein so that water in the trough is free to flow downwardly into downspouts **26**. The lower ends of the downspouts extend through the floor and discharge water beneath the car and on the tracks. Downspouts **26** are located in the cab alongside the aisle opening in partition **16**.

An angle member **29** is connected by screws **30** to the upper rear edge of partition **16** and to a ceiling panel **31**. Screws **30** extend through the partition and are screwed into the rear wall **20** of the trough to rigidly attach the upper edge of the partition to the trough **21**. The trough is preferably of sheet metal, such as stainless steel, and serves as a transverse structural roof member. Any gaps or holes at the sides of the trough can be filled with a suitable sealing compound. Although the bottom wall **22** of the trough is flat and the holes **27** are relatively small, water in the trough flows into the downspouts **26** due to the sloshing back and forth of the water due to the motion of the car. If desired, the bottom wall of the trough can be shaped or sloped so that water flows more readily to the downspouts.

The rear end of car body **11** includes a plastic hood **34** which extends over the roof and down the sides. The rear end of corrugated roof **12** is attached to a transversely bent arcuate member **35** having a down-turned edge **36** that overlaps and is welded to the upstanding front wall **37** of a transversely-extending horizontal trough **38**. The front roof edge of hood **34** is spaced above the rear end of corrugated room **12** so that water flowing rearwardly along the roof flows off its rear end, beneath hood **34** and into trough **38**. The rear end of trough **38** includes a downturned lip **39** riveted to hood **34**, and an end wall **40** is welded to the bottom wall of trough **38**.

Each side edge of the bottom wall of trough **38** abuts the upper end of and overlaps a corner post **42** connected at its upper edge to rail **25** that is cut-away so water is free to flow off the sides of the trough **38** and downwardly over the outside of the corner post **42**. Each side edge is connected to post **42** by an angle **46**. Hood **34** is wrapped around the corner of the car so that side portions define, in conjunction with corner post **42**, a downspout **43** located at the sides of the rear end of the car. The front edge of hood **34** is riveted to the front end of corner post **42** and the rear edge of **34** is riveted to the front edge of a side sheet **44** that is welded to the flange **45** at the front edge of corner post **42**.

Thus, any water which flows rearwardly along the roof flows off the rear end of the roof into trough **38** where it flows transversely through the trough, aided by a sloshing action into downspouts **43** and downwardly therethrough for discharge beneath the car body. By providing such a drainage system at both the front and rear ends of the roof, water does not flow off the ends of the car but is drained downwardly through the interior of the car for discharge beneath the level of the platform so that neither people standing on the platform nor passengers, nor the motorman would be splashed by any water.

What is claimed is:

1. In a railway car having a roof supported by a pair of sidewalls, said roof having corrugations extending parallel to the longitudinal axis of said car and defining troughs suitable for carrying water lengthwise thereof, said roof and terminating along an edge short of one end of said car, a hood member extending across the entire transverse width of the roof and secured to said sidewalls at said one end of said car, said hood member having an edge adjacent and disposed in vertical spaced relationship above said terminating edge portion of said roof, trough means extending across the entire transverse width of said roof and supported at its opposite ends by said pair of sidewalls, said trough means including a bottom wall and first and second sidewalls extending thereabove, said first sidewall being positioned beneath and affixed along its top marginal edge to said terminating edge of said roof, said second sidewall being affixed along its top marginal edge to the under surface of said hood, said bottom wall of said trough having an opening therein, and downspout means secured to said bottom wall and aligned with said opening to convey water out of said trough means.

2. In a railway car having a transversely curved roof supported by a pair of sidewalls, said roof having corrugations extending parallel to longitudinal axis of said car and defining troughs suitable for carrying water lengthwise thereof, said roof terminating along an edge short of one end of said car, a hood member extending across the entire width of the roof and secured to said sidewalls at said one end of said car, said hood member having an edge overlapping and disposed in vertical spaced relationship above said terminating edge portion of said roof, trough means extending across the entire transverse width of said roof and supported at its opposite ends by said pair of sidewalls, said trough means including a bottom wall and first and second sidewalls extending thereabove, said first sidewall having an upper curved marginal edge of the same curvature as said roof and positioned beneath and affixed to said terminating edge portion of said roof, said second sidewall being affixed along its top marginal edge to the under surface of said hood, said bottom wall of said trough having an opening therein, and downspout means secured to said bottom wall and aligned with said opening to convey water out of said trough means.

3. In a railway car having a transversely curved roof supported by a pair of sidewalls, said roof having corrugations extending parallel to the longitudinal axis of said car and defining troughs suitable for carrying water lengthwise thereof, said roof terminating along an edge short of one end of said car, a hood member extending across the entire width of the roof and secured to said sidewalls at said one end of said car, said hood having an edge portion overlapping and disposed in vertical spaced relationship above said terminating edge portion of said roof, trough means extending across the entire transverse width of said roof and supported at its opposite ends by said pair of sidewalls, said trough means including a bottom wall and first and second sidewalls extending thereabove, a transverse support member having an arcuate top surface of the same curvature as the terminating edge portion of said roof and affixed to its undersurface and a depending portion affixed to said first sidewall, said second sidewall being affixed along its top marginal edge to the undersurface of said hood, said bottom wall of said trough having an opening therein, and downspout means secured to said bottom wall and aligned with said opening to convey water out of said trough.

4. In a rail car having a floor, a pair of sidewalls, a roof, partition means spaced from one end of said car to define an operator's cab, said partition means extending inwardly from said sidewalls and upwardly from said floor and having an opening corresponding to a central aisle of said car, said roof having corrugations extending parallel to the longitudinal axis of said car and defining troughs suitable for carrying water lengthwise thereof, said roof terminating along an edge adjacent one face of said partition means, a hood member extending across the entire width of the roof and secured to said sidewalls to enclose said operator's cab, said hood member having an edge overlapping and disposed in vertical spaced relationship above said terminating edge portion of said roof, trough means extending across the entire transverse width of said roof and supported at its opposite ends by said pair of sidewalls, said trough means including a bottom wall and first and second sidewalls extending thereabove, said first sidewall being positoned beneath and affixed along its top marginal edge to said terminating edge of said roof and along its lower portion to said partition means, said second sidewall being affixed along its top marginal edge to the undersurface of said hood, said bottom wall of said trough having a pair of spaced openings therein, and downspout means disposed on opposite sides of said aisle and secured to said bottom wall of said trough means in alignment with said openings to convey water out of said trough means.

5. In a railway car having a floor, a pair of sidewalls, an end wall, a pair of corner posts, each corner post serving to interconnect one of said sidewalls to said end wall, a transverse member extending across the entire width of said car, said transverse member including a base portion affixed along a marginal edge thereof to said end wall and including an upstanding wall spaced therefrom, said base portion having outer side portions overlying the top edge portion of said corner posts, roof means supported between said sidewalls and having a terminal edge portion overlying and affixed to said top marginal edge of said upstanding wall, said roof means having corrugations extending parallel to the longitudinal axis of said car and defining troughs suitable for carrying water lengthwise thereof, and hood means etxending across the entire width of the roof, said roof means having an end portion affixed to said marginal edge of the base portion of said transverse member and having an edge portion supporting in spaced relationship above and adjacent the terminal edge portion of said roof, said hood means including a pair of downwardly depending portions secured to said sidewalls and to said corner posts to define downspouts therebetween.

6. In a railway car having a floor, a pair of sidewalls, partition means adjacent one end of said car to define an operator's cab, said partition means extending inwardly from said sidewalls and upwardly from said floor, said roof having corrugations defining troughs suitable for carrying water lengthwise of said car, one portion of said roof terminating along an edge adjacent one face of said partition means, said car having an end wall at the other end of said car, a pair of corner posts on opposite sides of said end wall and serving to interconnect said sidewalls to said end wall, a first transverse member having a base affixed along its marginal edge to said end wall and including an upstanding wall spaced from said marginal edge, the other portion of said roof overlying and secured to the top marginal edge of said upstanding wall, first hood means having an end portion affixed to said marginal edge of the base of said transverse member and having an edge portion supporting in spaced relationship above and overlapping the terminal edge portion of said roof, said hood means including a pair of downwardly, depending portions extending outwardly of said corner posts to define downspouts therebetween, second hood means disposed above said operator's cab and having an edge portion positioned above and in close proximity to said terminating edge of said roof adjacent said partition means, trough means disposed transversely of said car in the upper portion of said operator's cab between said sidewalls, and beneath said second hood means, said trough means including a bottom wall and first and second side walls extending thereabove, said first wall being positioned beneath and affixed along its top marginal edge to said terminating edge of said roof and to said partition

means, said second wall being affixed along the top marginal edge to the undersurface of said hood, said bottom wall of said trough having an opening therein, and downspout means secured to said trough means in alignment with said opening to convey water out of said trough means.

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