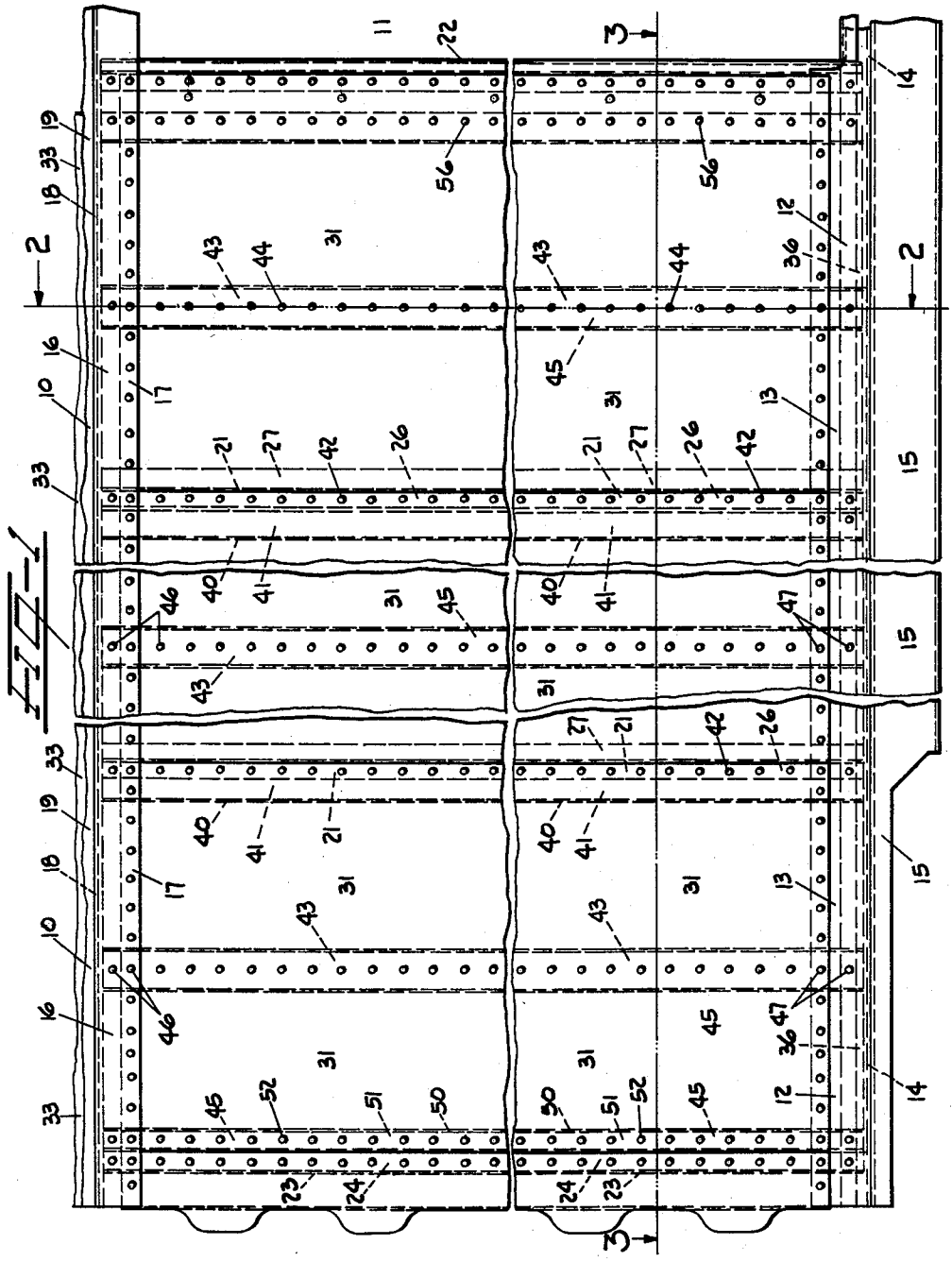
Feb. 2, 1960 C. E. JOHANSSON 2,923,256

METALLIC LININGS FOR BOX CARS

Filed May 27, 1957 3 Sheets-Sheet 1



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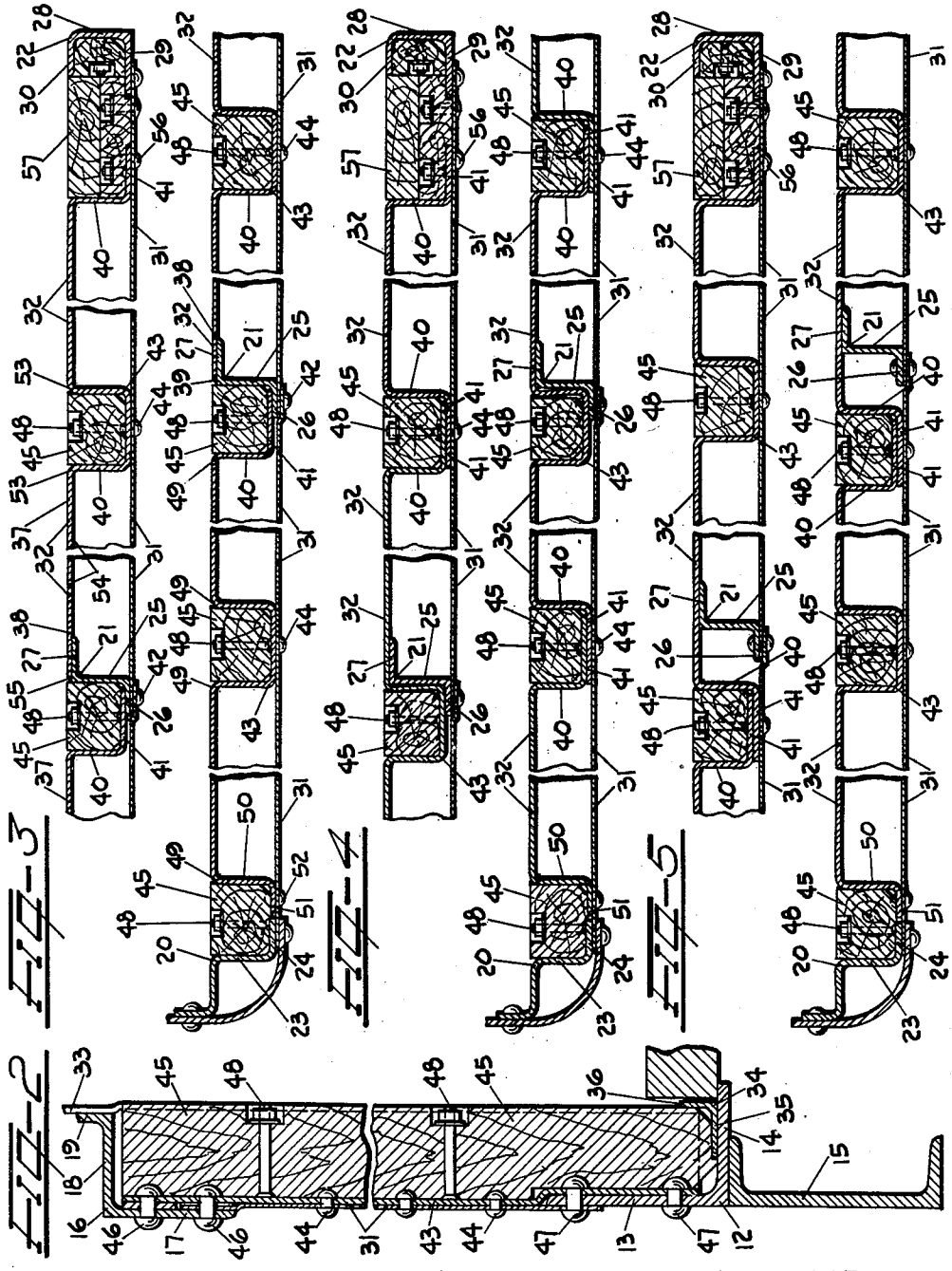


FIG-3

FIG-4

FIG-5

FIG-2

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3 Sheets-Sheet 3

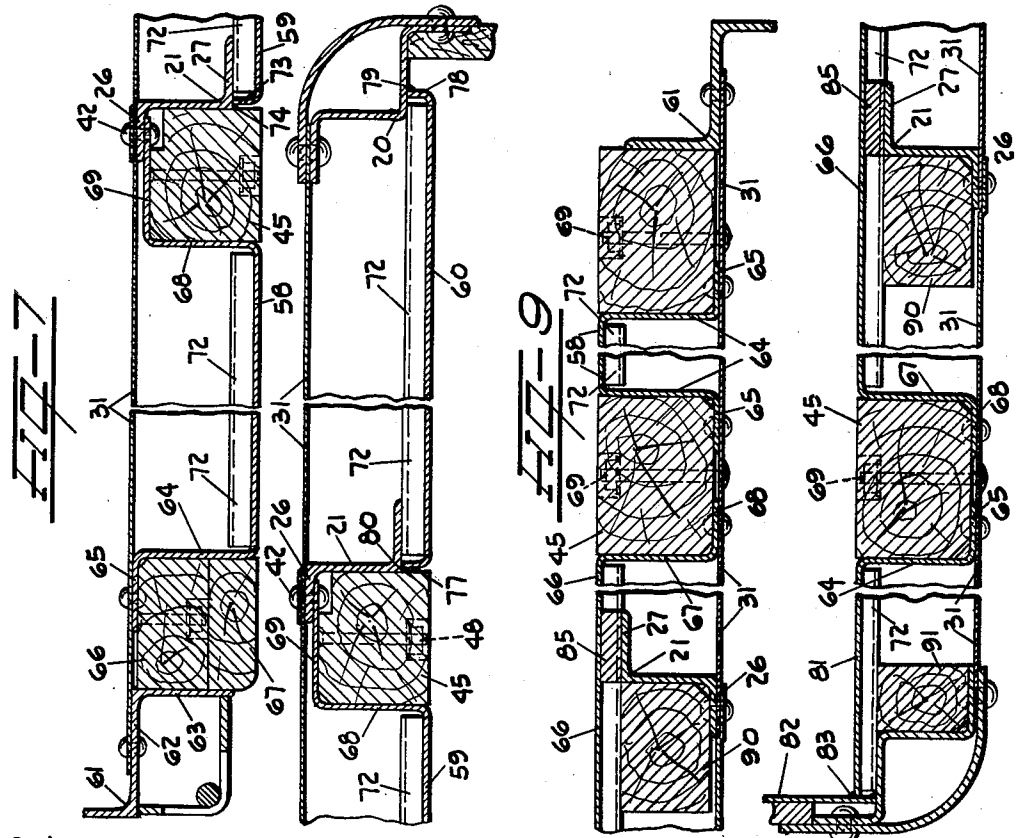


FIG-7

FIG-9

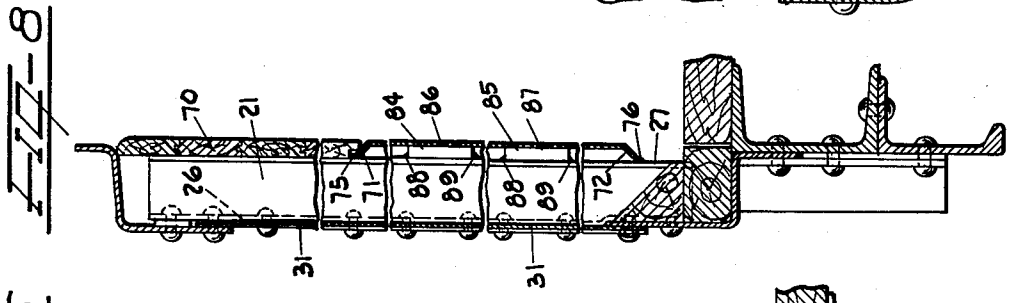


FIG-8

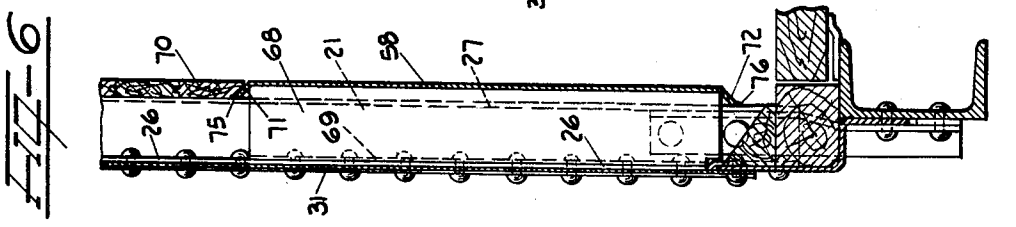


FIG-6

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METALLIC LININGS FOR BOX CARS

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Application May 27, 1957, Serial No. 661,713

7 Claims. (Cl. 105—423)

This invention relates to metallic linings for box cars.

It is an object of this invention to provide linings for box cars which shall be capable of better resisting blows from lift trucks, lading or the like than the wooden lining presently used in box cars.

A further object is to provide metallic linings for box cars adapted for application to new cars.

A further object is to provide metallic linings for box cars adapted for application to existing cars.

A further object is to provide metallic linings for box cars adapted to extend from the side sills to the side plates of the cars.

A further object is to provide metallic linings for box cars adapted to extend part way from the side sills to the side plates of the cars and supplement the wooden linings used in the upper part of the cars.

A further object is to provide metallic linings for box cars so formed and associated with the intermediate, corner and door posts of the cars as to provide pockets for the reception of nailing members.

A further object is to provide metallic linings for box cars so formed and associated with the posts and metallic sheathing of the side walls of the cars as to brace the sheathing and reinforce the side walls.

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 fragmnetary elevation of a side wall of a box car having metallic lining embodying one form of the invention wherein the lining extends from the side sill to the side plate of the side wall.

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1.

Fig. 3 is a horizontal section taken on line 3—3 of Fig. 1.

Fig. 4 is a horizontal section similar to Fig. 3 showing another form of the invention.

Fig. 5 is a horizontal section similar to Fig. 3 showing still another form of the invention.

Fig. 6 is a vertical section similar to Fig. 2 illustrating an embodiment of the invention wherein the lining extends only part way from the side sill to the side plate.

Fig. 7 is a horizontal section similar to Fig. 3 of the embodiment of the invention shown in Fig. 6, this section being shown in two parts to permit an increase in the size of the view.

Fig. 8 is a vertical section similar to Fig. 6 showing another form of the partial lining illustrated in Figs. 6 and 7.

Fig. 9 is a horizontal section similar to Fig. 7 of the form of the invention shown in Fig. 8.

Referring first to the embodiment of the invention illustrated in Figs. 1 to 3 the reference numeral **10** designates as a whole a portion of a side wall of a railway box car extending from the door opening **11** to the left hand end of the car. It will be understood that the portion of the side wall **10** extending from the door opening to the right hand end of the car is complementary to and of similar construction to the portion of the side wall illustrated and that the side wall on the opposite side of the car is similar in construction to the side wall disclosed above.

The side wall **10** embodies a side sill **12** in the form of an angle member disposed with one leg **13** extending upwardly and the other leg **14** extending inwardly. A channel **15** is secured to the inwardly extending leg **14** of the side sill in any desired manner and serves to reinforce the side sill.

The side wall **10** also embodies a side plate **16** substantially in the form of a Z-shaped member having outer downwardly extending flange **17**, an outwardly extending web **18** and an upwardly extending inner flange **19**. Corner, intermediate and door posts **20**, **21** and **22** extend between and are secured to the flanges **13** and **17** of the side sill and side plate in the customary manner. The corner post **20** is substantially W-shaped in section and embodies an outwardly or transversely extending flange **23** and a longitudinally extending flange **24**. Each of the intermediate posts is Z-shaped in section and is disposed with its web **25** extending outwardly and with its outer and inner flanges **26** and **27** lying respectively substantially in the outer and inner planes of the side wall. The door post **22** is the conventional channel-shaped post arranged with its web **28** extending transversely to the side wall and its outer and inner flanges **29** and **30** lie respectively in the inner and outer planes of the side wall **10**. Metallic sheathing **31** is secured to the outer flanges of the posts as shown more clearly in Fig. 3 of the drawings.

In accordance with the instant invention the customary wooden lining of box cars is replaced by metallic lining **32** which in the considered embodiment extends between and is secured in any desired manner to the side sill and side plate of the side wall. As shown in Fig. 2 of the drawings the metallic lining which is formed of a plurality of sections is provided with flange **33** along its upper margin that is secured to the inner upstanding flange **19** of the side plate. The lower marginal portion of the metallic lining which lies in the inner plane of the side wall is secured to the inwardly extending flange **14** of the side sill by means of an angle member **34** whose horizontally displosed leg **35** is secured in any desired manner to the flange **14** of the side sill and whose upstanding leg **36** is disposed inwardly of the lining and is secured to the lower margin thereof in any desired manner.

Each section **37** of the metallic lining which extends between the intermediate posts **21** has a portion **38** lying in the inner plane of the side wall which bears against and is welded to the corresponding flange **27** of the intermediate posts as indicated at **39**. The opposite marginal portion of each of the lining sections **37** is bent outwardly and is formed into an angular portion having an outwardly or transversely extending flange **40** and a longitudinally extending flange **41** which bears against the inner face of the outer flange **26** of the intermediate posts. The relationship of the flange **41** of the lining sections and the flanges **26** of the intermediate posts is such that the rivets **42** which secure the sheathing sections to the flanges **26** are also utilized to secure the flanges **41** of the lining sections to the flanges **26**.

Intermediate the portion **38** of each of these lining sections and the marginal portion **40—41** thereof the lining sections are formed with inwardly opening channel portions such as shown at **43**. As illustrated in Fig. 3 of the drawings the channel portions **43** bear against and are secured as by means of rivets **44** to the inner face of the metallic sheathing **31**. In this manner the inwardly opening channel portions of the metallic lining sections **37** serve to brace the metallic sheathing and to provide pockets for the reception of wooden nailing members **45**. As shown in Fig. 2 of the drawings the inwardly opening

channel portions of the metallic lining are additionally secured to the outer downwardly extending flange **17** of the side plate as by means of rivets **46** and to the upstanding flange **13** of the side sill as by means of rivets **47**. These channel portions, accordingly, provide in effect additional intermediate posts for the side wall as well as pockets for the reception of the nailing members **45**. Since the metallic lining is thicker than the metallic sheathing the nailing members **45** are secured within the channel portions **43** by means of Nelson studs **48** which are flash welded to the webs of the inwardly opening channel portions **43** in the usual manner.

As shown in Fig. 3 of the drawings the angular marginal portion **40, 41** of the intermediate lining section **38** cooperates with the intermediate post **21** to which it is secured to provide an inwardly opening channel which also receives a nailing member **45** secured therein in a manner hereinabove described by the studs **48**.

A metallic lining section **49** extends between the corner post **20** and the adjacent intermediate post **21**. The vertical marginal portion of this lining section which lies adjacent to an intermediate post is formed with the angularly related flanges **40** and **41**, the latter of which is secured to the flange **26** of the intermediate post by means of the rivets **42** so that these flanges cooperate with the intermediate post to provide an inwardly opening channel within which a nailing member **45** is secured by means of Nelson studs **48**. The opposite vertical margin of the lining section **49** is provided with angularly related flanges **50** and **51** similar to the flanges **40** and **41**. The flange **51** which extends longitudinally is secured as by means of rivets **52** to the sheathing **31**. The flanges **50** and **51** cooperate with the flanges **23** and **24** of the corner post **20** to provide an inwardly opening channel within which a nailing member **45** is secured by means of Nelson studs **48**.

A lining section **53** extends between the door post **22** and the adjacent intermediate post **21**. This lining section has a portion **54** which lies in the inner plane of the side wall and overlaps the inner flange **27** of the intermediate door post. This portion is welded to the intermediate door post as indicated at **55**. The opposite marginal portion of the lining section **53** is provided with the angular flanges **40** and **41**, the latter flange being secured to the metallic sheathing by means of rivets **56**. The flanges **40** and **41** cooperate with the door post **22** to provide a substantially channel-shaped portion within which nailing members **57** are secured in any desired manner. The intermediate portion of the panel section **53** is formed with an inwardly opening channel within which a nailing member **45** is secured by meaans of the studs **48**.

A modified form of the invention is illustrated in Fig. 4 of the drawings. In this form the metallic lining is formed with the inwardly opening channels **43** so located that they bear against the outer flanges **26** of the intermediate door post and are secured there by means of the same rivets which secure the metallic sheathing sections to these flanges. In view of this the vertical margins of these sections which form the lining are similarly formed. Between the corner intermediate and door posts the flanges **41** of the angular marginal portions of the lining sections are overlapped and secured together by means of rivets **44** so that these margins cooperate to provide inwardly opening channels within which nailing strips **45** are secured by the studs. The angular margins of the lining sections adjacent to the corner and door posts are related to these posts in the manner described in connection with the form of the invention illustrated in Figs. 1 to 3. In view of the description of the considered embodiment of the invention it will be apparent that welding of the lining sections to the intermediate posts is eliminated and the inwardly opening channels formed by the noted association of the marginal portions of the section linings has greater strength and provides a more rugged brace for the metallic sheathing and sturdier reinforcement for the side wall.

The form of the invention illustrated in Fig. 5 of the drawing utilizes the inwardly opening channels **43** between the corner intermediate and door posts. However, the lining construction of this form of the invention differs from the forms illustrated in Figs. 3 and 4 by the location of the angular marginal portions of the lining sections which are similar to the marginal portions of the lining illustrated in Figs. 3 and 4. In the considered form of the invention these angular marginal portions are related and secured together and to the metallic sheathing in the manner described in connection with the form of the invention illustrated in Fig. 4. However, the inwardly opening channels provided by this relationship are disposed adjacent to but longitudinally offset from the intermediate posts. In view of this construction the metallic lining can be applied to existing cars as well as to new cars.

Another embodiment of the invention is illustrated in Figs. 6 and 7 of the drawings. In this embodiment a lower metallic lining and an upper wooden lining formed of the customary tongue and groove boards are utilized. The lower metallic lining which is provided in the area where the most severe blows occur is formed of a plurality of sections **58, 59** and **60**. Lining section **58** extends between door post **61**, substantially **Z** shaped in section and having a web **62** to which the metallic sheathing is secured and an inwardly extending leg **63** lying at right angles to the sheathing, and the adjacent intermediate post **21**.

The vertical margin of section **58** which lies adjacent to the door post is angular in form and provided with an outwardly or transversely extending flange **64** and a longitudinally extending flange **65** which bears against and is riveted to the metallic sheathing. The angular flanges **64** and **65** cooperate with the inwardly extending leg **63** of the door post **61** to provide an inwardly extending substantially channel-shaped structure within which nailing members **66** and **67** are secured.

The opposite vertical marginal portion of panel section **58** is provided with angularly related flanges **68** and **69**. Flange **68** extends outwardly and flange **69** longitudinally. Flange **69** is secured by rivets **42** to the flange **26** of the intermediate post, these rivets serving as well to secure the metallic lining to this flange. The flanges **68** and **69** accordingly cooperate with the intermediate door post to provide an inwardly opening substantially channel-shaped construction within which the nailing member **45** is secured as indicated above.

As shown in Fig. 6 of the drawings the portion of section **58** which extends between the marginal flanges **64** and **68** is flush with the wooden lining **70**. To obtain this relationship the upper and lower margins of lining section **58** are flanged inwardly as indicated at **71** and **72** so as to strengthen the lining section. By this construction also the upper flange **71** forms an abutment for the lower edge of the wooden lining.

With the exception of the construction of one vertical marginal portion lining section **59** is similar to lining section **58**. Accordingly, lining section **59** is provided with the angularly related flanges **68** and **69** which are associated with an intermediate post in the manner hereinabove described in order to provide an inwardly extending, substantially channel-shaped structure. The opposite vertical margin of panel section **59**, however, is formed with an outwardly extending flange **73** which abuts and is welded to flange **27** of the intermediate post as indicated at **74**. Also the lining sections **59** extending between the intermediate posts are formed with the upper and lower flanges **71** and **72** which are welded to the flanges **27** of these posts as indicated at **75** and **76**.

The lining section **60**, which extends between the corner post **20** and the adjacent intermediate post are formed with outwardly extending vertical flanges **77** and **78**

which abut and are welded to the corner post and the adjacent intermediate post as indicated at 79 and 80. Lining section 60 carries the upper and lower flanges 71 and 72 which also abut the noted door and intermediate posts and are welded thereto as indicated at 75 and 76 in Fig. 6 of the drawings. In this embodiment of the invention nailing members are provided at the door post and at each of the intermediate posts.

The embodiment of the invention illustrated in Figs. 8 and 9 is similar to the embodiment shown in Figs. 6 and 7. However, lining section 58 lies between the door post and the adjacent intermediate post. The relationship between angularly related marginal flanges 64 and 65 and the door post is substantially the same as that described for the construction illustrated in Figs. 6 and 7 of the drawings. The opposite margin of lining section 58 is also formed with the angularly related flanges 64 and 65. The flanges 65 as shown in Fig. 9 of the drawings are riveted to the metallic sheathing 31.

In the considered embodiment of the invention intermediate lining sections 66 are utilized in place of the intermediate lining sections 59. As clearly shown in Fig. 9 of the drawings the intermediate lining sections 66 span the intermediate posts 21 and terminate in angularly related flanges 67 and 68 which extend along the vertical margins of these lining sections. Flanges 64 and 65 cooperate with flanges 67 and 68 to provide inwardly opening substantially channel-shaped structure within which nailing members 45 are secured. In this embodiment flange 68 which is riveted to the metallic sheathing is spaced from flange 65 in order to conserve material. In view of this fact that the nailing member 45 is secured to the metallic sheathing and for this purpose bolts 69 are used because of the relative thinness of the metallic sheathing.

Between the intermediate posts the angular flanges 67 and 68 of adjacent lining sections 66 are related in the same manner as angular flanges 64 and 65 and angular flanges 67 and 68 so that similarly opening substantially channel-shaped structures are provided within which nailing members are secured in the manner illustrated in Fig. 9.

The lining section 81 which extends from the corner post 20 and terminates adjacent to the angular flanges 67 and 68 of the adjacent intermediate lining section is formed adjacent to these flanges with the angularly related flanges 64 and 65 the latter of which is riveted to the metallic sheathing. The noted flanges of the lining section 81 and the adjacent intermediate lining section are related as described above to provide the channel formation in which the nailing member 45 is bolted. The opposite margin of the lining section 81 is not formed but is permitted to abut against and is welded to end lining 82 as indicated at 83. Each of the lining sections is provided with the upper and lower flanges 71 and 72, these flanges being welded to the intermediate and corner posts as heretofore described.

Where the intermediate lining sections 66 cross the intermeditae posts they abut filler members 84 and 85 to which they are plug welded as indicated at 86 and 87. These filler members, in turn, are welded to the intermediate posts as indicated at 88 and 89. Accordingly, at the intermediate posts the intermediate lining sections are backed up by the filler members and greater resistance is thereby offered to damage of the intermediate lining sections by blows delivered to these sections.

The intermediae posts and the corner posts carry the customary wooden nailing members 90 and 91 which extend substantially to the side plate of each side wall and provide means to which the upper wooden lining is nailed. In this embodiment of the invention as in that illustrated in Figs. 6 and 7 of the drawings the sections of the metallic lining are flush with the wooden lining.

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 modifications and changes 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 box car having side walls each embodying a side sill, a side plate, intermediate, corner and door posts extending between and secured to the side sill and side plate, metallic sheathing extending between the side sill, side plate and posts, and means securing the sheathing to the side sill, side plate and posts, an upper wood lining and a lower metallic lining for each side wall extending between the corner and door posts, means securing said linings to said intermediate posts, said linings being disposed in flush relationship, said metallic lining having outwardly extending upper and lower marginal flanges welded to said intermediate posts, said upper marginal flange lying contiguous to the lower edge of said wood lining, said metallic lining having vertical outwardly offset portions, and nailing members secured to said outwardly offset portions, said nailing members being flush with said linings.

2. In a railway box car having side walls each embodying a side sill, a side plate, intermediate, corner and door posts extending between and secured to the side sill and side plate, metallic sheathing extending between the side sill, side plate and posts, and means securing the sheathing to the side sill, side plate and posts, a metallic lining for each side wall extending between the corner and door posts, said lining comprising a plurality of sections having vertical outwardly offset angular marginal portions, said angular marginal portions being disposed adjacent to said intermediate posts and cooperating therewith to provide inwardly opening channels, and nailing members secured in said channels.

3. The combination as defined in claim 2 wherein said intermediate posts have flanges to which the sheathing is secured, said angular marginal portions have outwardly extending flanges terminating in flanges overlapping and secured to said flanges of the intermediate posts, said flanges of said lining sections and said intermediate posts including said flanges thereof cooperate to provide inwardly opening channels adapted to receive nailing members and said means which secures the sheathing to said flanges of said intermediate posts also secures said overlapping flanges of said lining sections to said flanges of said intermediate posts.

4. In a railway box car having side walls each embodying a side sill, a side plate, intermediate, corner and door posts extending between and secured to the side sill and side plate, metallic sheathing extending between the side sill, side plate and posts, and means securing the sheathing to the side sill, side plate and posts, an upper wood lining and a lower metallic lining for each side wall extending between the corner and door posts, means securing said linings to said intermediate posts, said linings being disposed in flush relationship, said metallic lining comprising a plurality of sections extending between said intermediate posts, said sections having outwardly extending upper marginal flanges lying contiguous to the lower edge of said wood lining, outwardly extending lower marginal flanges, outwardly extending vertical marginal flanges welded to said intermediate posts and vertical outwardly offset angular marginal portions disposed adjacent to said intermediate posts and cooperating therewith to provide inwardly opening channels, and nailing members secured in said channels, said nailing members being flush with said linings.

5. The combination as defined in claim 4 wherein said metallic lining also includes sections extending between said door posts and the adjacent intermediate posts, each of said latter sections has upper and lower outwardly extending flanges and vertical outwardly offset angular marginal portions disposed adjacent to and cooperating

with said door posts and adjacent intermediate posts to provide inwardly opening channels, and nailing members flush with said linings are secured in said channels.

6. The combination as defined in claim 5 wherein said metallic lining also includes sections extending between said corner posts and the adjacent intermediate posts, each of said latter sections has upper and lower outwardly extending flanges and vertical outwardly extending marginal flanges, and said latter flanges are welded to said corner posts and said adjacent intermediate posts.

7. In a railway box car having side walls each embodying a side sill, a side plate, intermediate, corner and door posts extending between and secured to the side sill and side plate, metallic sheathing extending between the side sill, side plate and posts, and means securing the sheathing to the side sill, side plate and posts, and metallic lining for each side wall extending between the corner and door posts, said lining comprising a plurality of sections having vertical outwardly offset angular marginal portions, said angular marginal portions being disposed adjacent to said intermediate posts and cooperating therewith to provide inwardly opening channels, said lining sections being formed with inwardly opening channels disposed between said intermediate posts and in engagement with said sheathing, means securing said latter channels to said sheathing, and nailing members secured in all said channels.

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