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LOCOMOTIVE STRUCTURE

Filed Sept. 2, 1949 5 Sheets-Sheet 1

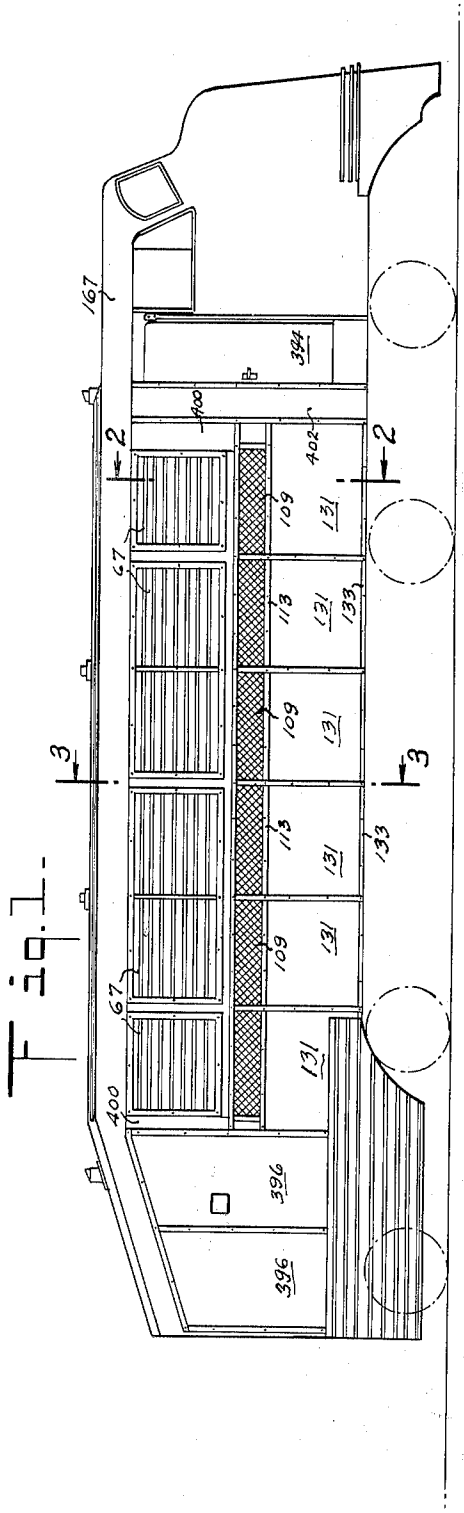

Fig. 1.

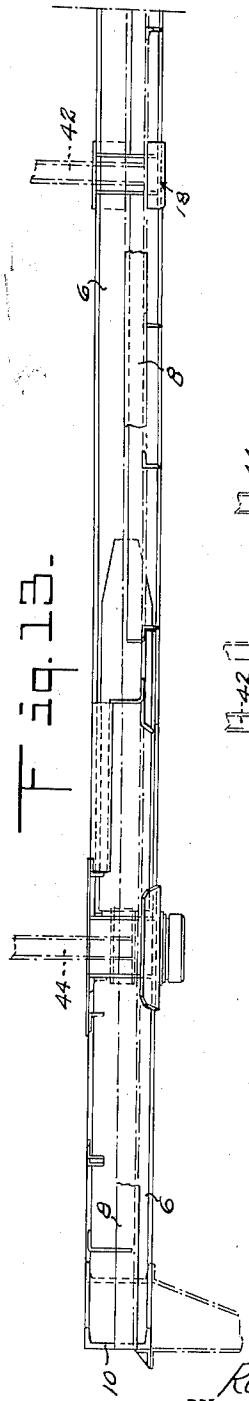

Fig. 13.

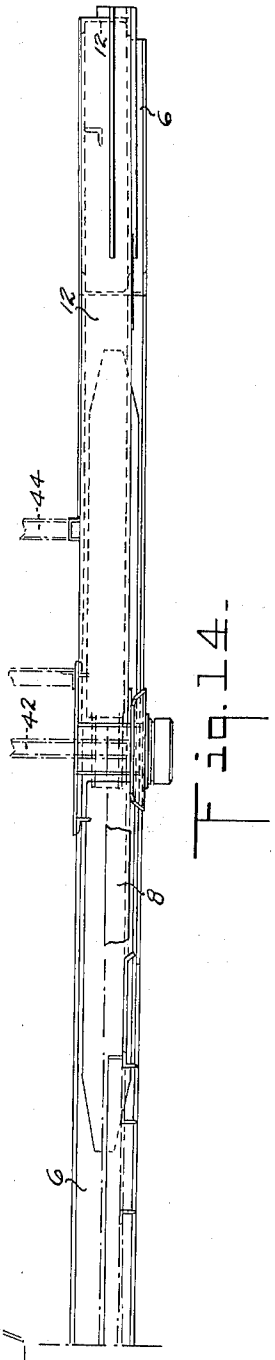

Fig. 14.

INVENTOR.
ROBERT WALSH
BY George R. Ericson
ATTORNEY

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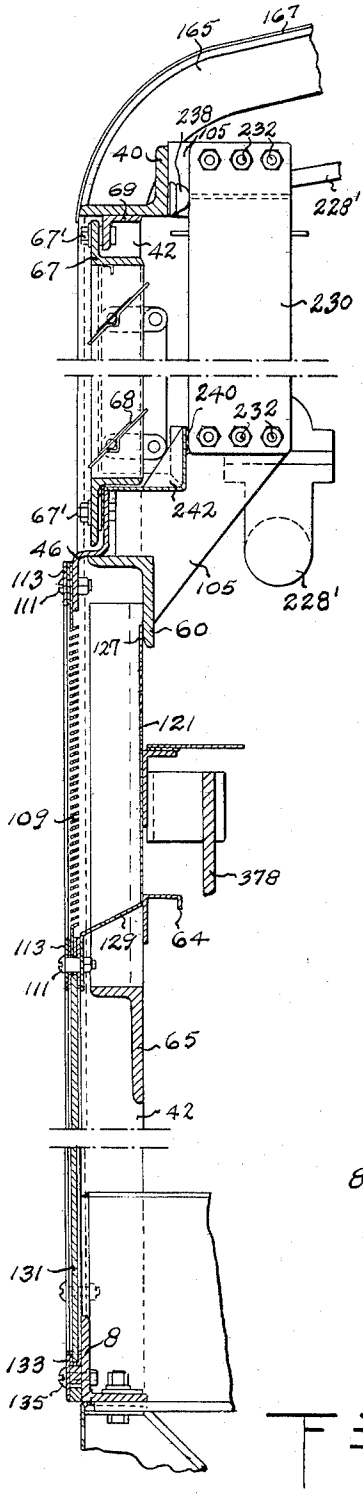

Fig. 2.

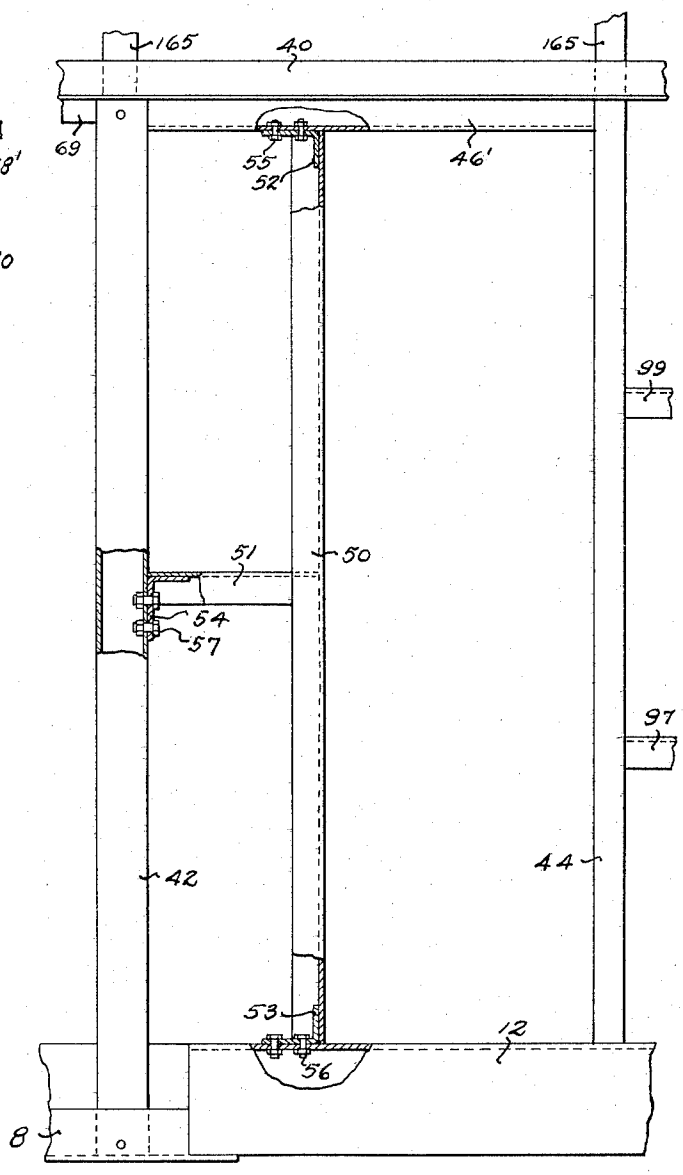

Fig. 12.

INVENTOR.
ROBERT WALSH
BY George R. Ericson

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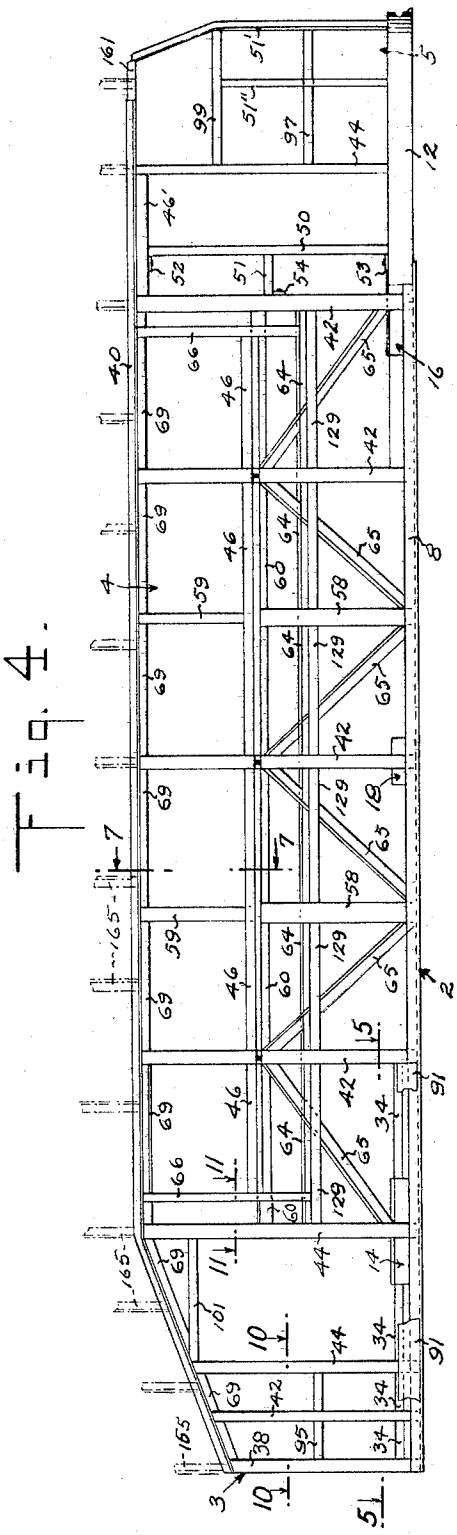

Fig. 4.

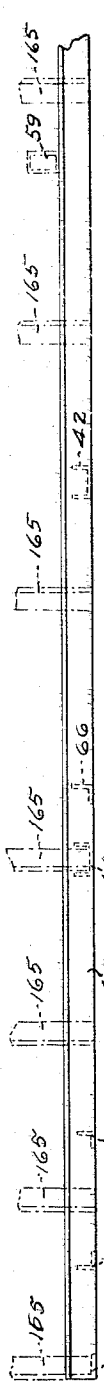

Fig. 9.

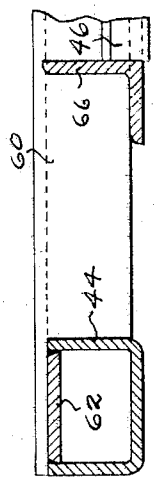

Fig. 11.

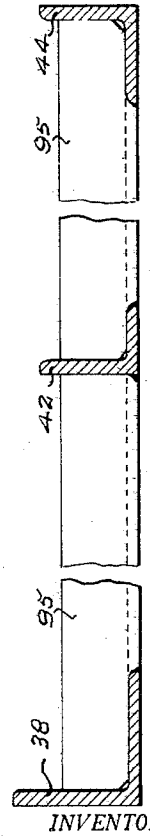

Fig. 10.

INVENTOR.
ROBERT WALSH
BY
George R. Ericson
ATTORNEY

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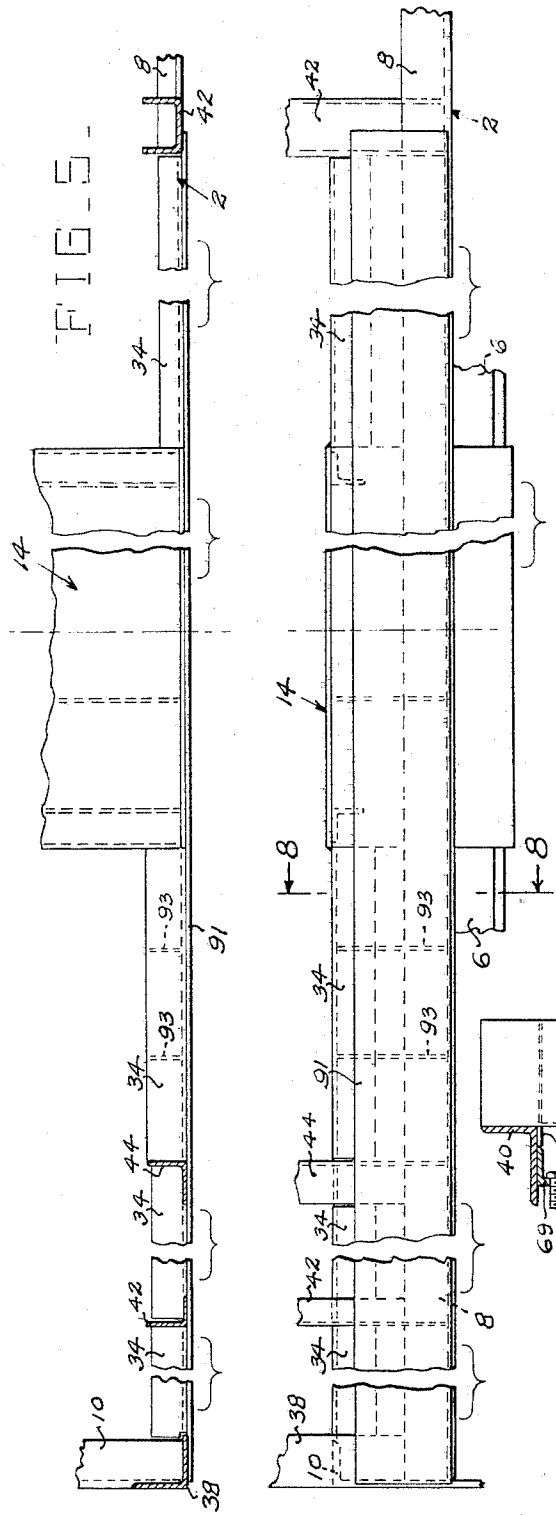

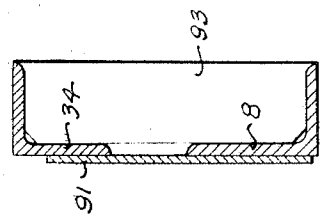

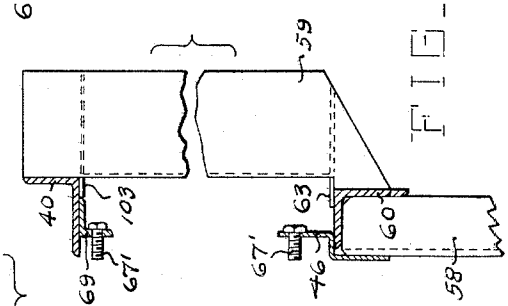

INVENTOR.
ROBERT WALSH
BY
George R. Ericson

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LOCOMOTIVE STRUCTURE

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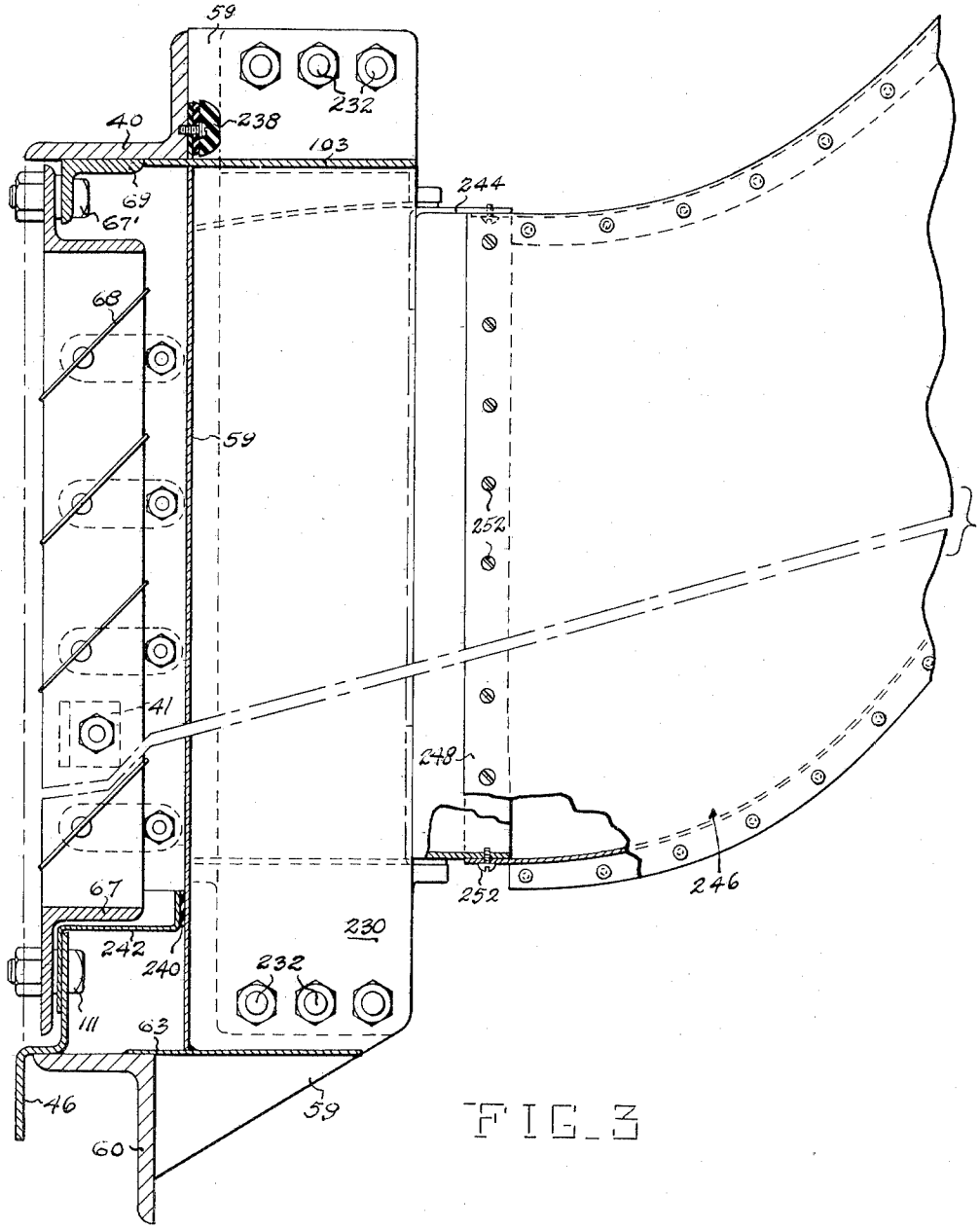

FIG. 3

INVENTOR.
ROBERT WALSH
BY
George R. Ericson
ATTORNEY

United States Patent Office 2,719,488
Patented Oct. 4, 1955

2,719,488

LOCOMOTIVE STRUCTURE

Robert Walsh, Wilmington, Del., assignor to American Car and Foundry Company, New York, N. Y., a corporation of New Jersey

Application September 2, 1949, Serial No. 113,727

3 Claims. (Cl. 105—62)

This invention relates to railway locomotives and more particularly to framing structure for locomotives of the diesel engine-electric type.

An object of the invention is to provide a locomotive side frame structure particularly adapted for installation and support of associated equipment necessary in locomotives of this type.

Another object of the invention resides in side frame construction for supporting radiators in a water cooling system for internal combustion engines.

A further object of the invention resides in side frame construction in which tiers of openings are provided for ventilating the locomotive and for exterior access to the electric control chamber and batteries.

These and other objects of the invention will be apparent to those skilled in the art from a study of the following description and accompanying drawings, in which:

Fig. 1 is a side elevational view of the locomotive;

Fig. 2 is a fragmentary sectional view of one side of the locomotive taken on line 2—2 of Fig. 1;

Fig. 3 is a sectional view of the locomotive taken on line 3—3 of Fig. 1;

Fig. 4 is a side elevational view of one of the locomotive side frames;

Fig. 5 is a sectional view of the framing taken on line 5—5 of Fig. 4;

Fig. 6 is a plan view of the structure in Fig. 5;

Fig. 7 is a sectional view of the side frame taken on line 7—7 of Fig. 4;

Fig. 8 is a sectional view taken on line 8—8 of Fig. 6;

Fig. 9 is a top plan view of the top of the rear end of a side frame;

Fig. 10 is a sectional view of the side frame taken on line 10—10 of Fig. 4;

Fig. 11 is a sectional view of the side frame taken on line 11—11 of Fig. 4;

Fig. 12 is a fragmentary elevational view of the side frame showing the removable door post structure;

Fig. 13 is a side view of the rear half of the underframe with the side sill removed; and

Fig. 14 is a side view of the front half of the underframe with the side and front sills removed.

The reference numeral 2 indicates the underframe (only incidentally shown) of the locomotive on which is mounted similar side frames 4 and end frames 3 and 5. The underframe includes U-shaped center sill members 6 extending the full length thereof, angle side sills 8, rear channel sill 10 and curved front channel sill 12. The rear legs of the front sill are welded to the forward ends of the side sills, the rear ends of the side sills are welded to the rear sill and the ends of the center sills are welded to the front and rear sills. Similar rear and forward bolster structures 14 and 16, respectively, extend transversely of the underframe and are secured to the side frames and center sill members. Cross bearer 18 extends transversely of the underframe, centrally between the bolsters, and is secured to the side sills and underframe members. Angle members 34 are arranged above the side

sills 8 in advance of and at the rear of the rear bolster and an outer cover plate 91 is welded to members 34 and 8 closing the space therebetween. Brace members 93, see Figs. 5, 6 and 8, are welded between the side sill and members 34.

As previously stated, the side frame structures 4 are similar and references may be had to Figs. 2, 4, 6 and 9 through 12 for details of the same. Numeral 38 indicates the rear end post in advance of which are side posts 42, door posts 44 and 50 and front posts 51′ and 51″. Posts 42 and 44 are continuous and are assembled with the base portions to the outside and their lower ends inside of the vertical flange of the side sill 8, the adjacent portions of such posts and side sill being welded together. Front posts 51′ and 51″ are welded to the front sill 12. Roof side angle plate 40 is secured on the top of the end post and posts 42, 44 and 51′ and 51″, the base flange of the side roof plate and the adjacent post ends being welded together. Angle brace 46′ extends beneath the roof plate between front posts 42 and 44 and is welded to such members.

Door post 50 has a rearwardly extending horizontal leg or brace member 51 welded thereto and such unit is detachably secured in the side frame. Upper and lower brackets 52 and 53 are welded to the ends of post 50 and bracket 54 is welded to the rear end of member 51. The upper bracket 52 is secured to the brace member 46′ by bolts 55, the lower bracket is secured on top of the front end sill 12 by bolts 56 and bracket 54 is secured to the adjacent side post 42 by bolts 57. One of the detachable door post structures must be removed to provide sufficient clearance when moving an auxiliary power plant endwise from a front side of the locomotive.

Sectional side posts are assembled between some of the side posts and each comprises a lower section 58 and an upper section 59. Sections 58 are U-shaped in cross section and the base portions thereof lie inside the vertical flange of the side sill and rest on the horizontal portion of the side sills, the base portions of the posts being welded to the side sills. Sections 59 are also U-shaped in cross section but of less width and greater depth than sections 58 and are located inwardly thereof. An angle belt rail 60 extends longitudinally from a rear post 44 to front post 42 and is welded thereto at its ends. This belt rail lies over the tops of the lower post sections 58 and the top flange is cut out to receive posts 42 and 66. Filler plates 62 are welded inside of the inner flanges of the posts 44 adjacent the belt rail. Post sections 59 have a base member 63 and a top member 103 welded between their parallel flanges, such members projecting outside of the post sections. The lower ends of the parallel flanges of post sections 59 extend below the base members, see Figs. 3 and 7, and are welded to the inner face of the angle belt rail 60. The upper ends of post sections 59 lie adjacent the inside of the inner face of roof plate 40 and are welded thereto. Top members 103 project under and are welded to roof plate 40 and bottom member 63 overlies rail 60 and is welded thereto.

Posts 42 have radiator supporting plates 105 fixed outside of their flanges and extend inwardly approximately the same distance as and parallel to the flanges of post sections 59, see Fig. 2. The lower ends of plates 105 are formed to rest on the inner top face and against the upper rear face of the belt rail 60 to which they are welded. The upper ends of such plates lie inside of the roof plate and are welded thereto.

Longitudinal brace members 95 are welded to end post 38, and the adjacent post 42 and between such post 42 and the rear post 44. Horizontal brace members 97 and 99 extend between front posts 44 and 51′ and are welded thereto and to post 51″. A top door frame

member **101** is welded between rear posts **44**. An intermediate belt rail **64** lies between belt rail **60** and the side sill and is welded to the inner edges of the flanges of posts **42**, **66** and **58**. Bracket strips **46** extend between posts **42** in front of and above the belt rail **60** and are welded to such rail and posts. Bracket strips **46** also extend between front and rear posts **42** and adjacent posts **66** over the belt rail **60** and are welded thereto, the bracket strips having their ends cut away to clear the sides of the posts **42**. Truss angle members **65** extend from the base portions of post sections **58** to the belt rail adjacent posts **42**, from rear post **44** to post **42** in advance thereof and from the front post **42** to post **42** therebehind. Members **65** are welded to the side sill, belt rails and adjacent posts. Side posts **66**, in advance of rear post **44** and to the rear of front post **42**, extend between and are welded to belt rails **64** and **60** and roof plate **40**.

The spaces between the roof plate **40**, belt rail **60** and posts **42**, above post sections **58**, provide inlet openings through which air passes to the water cooling systems for the engines of the main power units. Frames formed of welded together angle members **67** carrying shutters **68** are arranged in such air inlet spaces and are secured by bolts **67'** to depending brackets **69** welded to the roof plate, bracket strips **46** and brackets **41** welded to the sides of posts **42**. Similar shutter carrying frames are arranged and similarly secured in end spaces above the belt rail **60** adjacent the spaces between post **66** and adjacent post **42**. These frames **67** provide inlets through which air flows to the water cooling systems of the auxiliary and main power plants.

The spaces between belt rail **60** and rail **64** therebelow form openings through which ventilating air flows to the interior of the locomotive power chamber. Louver panels **109** extend outside of the spaces. A frame member **113** extends around the edge portion of each panel and bolts **111** secure the panels and frames to bracket **46**, the side posts and brackets **129** welded at their rear edges to belt rail sections **64**, see Figs. 2 and 4. Filter sheets **121** are secured across the air openings through the side frame above brackets **129** and such sheets are carried by frames **127** suitably secured to the side frame.

Detachable panels **131** are arranged over each opening between the side posts, the louvered panel and the side sill. Such panels are secured at their upper edges by the lower portion of frames **113**, at their lower edges by strips **133** secured to the side sill by detachable bolts **135** and vertical extensions of the sides of frames **113**. When these panels are removed, access can be had to the control panel **378** and the batteries (not shown) from outside of the locomotive. Roof plate **161** extends over and is welded to front posts **51'**, see Fig. 4. Carlines **165** connect purlines (not shown) and the roof plates **40**. A suitable sheet cover **167** is secured over the roof and end frames. Door **394** is hinged to forward post **44** to close the opening between such post and post **50**. Panels **396** enclose the spaces between end post **38** and rear post **44** and between rear posts **44**, such panels being detachably secured to the posts and to members **34** and **69**. Panels **400** close the space between posts **66** and the adjacent posts **42** and **44**, and removable panel **402** closes the space between front post **42** and post **66**.

The locomotive engines (not shown) are of the water cooled type and the water temperature is maintained in some predetermined temperature range by a cooling system including pipes **228'** connecting the engines with radiators **230** supported from the side frame posts behind the shutter frames **69** as shown in Fig. 2. There are two radiators on each side of the locomotive for each of the traction power engine cooling systems and one radiator on each side of the locomotive for each auxiliary power engine cooling system. The radiators are located transversely in line with their associated engines and hence there is maximum cooling efficiency because of minimum piping length in the cooling system. Bolts **232** secure the top and bottom of the radiators to plates **105** projecting from posts **42** and to the flanges of post sections **59**. Rubber bumper strips **238** are secured to the roof flange **40** and engage the upper ends of the radiators. The lower outer ends of the radiators are engaged by bottom sealing strips **240** attached to brackets **242** secured to brackets **46** by the bolts securing the shutter frames in position, see Figs. 2 and 3. Neck flanges **244** secured to the radiators **230** extend inwardly from the inner side of the radiators and the inlet end of transversely extending air ducts **246** interfit therewith and are secured in such relation by fastening flanges **248** and screws **252**, as shown in Fig. 3.

The invention may be modified in various respects as will occur to those skilled in the art and the exclusive use of all modifications as come within the scope of the appended claims is contemplated.

What is claimed is:

1. In locomotive framing, a side roof plate, a side sill, continuous straight side posts secured at their ends to the plate and the sill, a belt rail secured to said continuous posts, and sectional side posts intermediate the continuous posts, the lower section of said sectional posts being fixed to the side sill and belt rail at its ends and lying in a vertical plane with the continuous posts and the upper section of the sectional posts lying in a vertical plane offset inwardly of the lower sections and having bottom and top plates secured at their outer ends, respectively, to the belt rail and to the roof plate.

2. In locomotive framing, a side roof plate, a side sill, continuous side posts secured at their ends to the roof plate and side sill, a belt rail having cut out portions for receiving said continuous side posts, said rail and posts being secured together, and two-section side posts between the continuous side posts, the lower sections of said sectional side posts being in a vertical plane with the belt rail and secured at their ends to the side sill and the belt rail, and the upper sections thereof being in a vertical plane offset inwardly of the plane of the lower sections and formed with integral base and top members secured, respectively, to the belt rail and roof plate.

3. In a locomotive framing, a side roof plate, a side sill, continuous side posts secured at their ends to the roof plate and side sill, a belt rail having cut out portions for receiving said continuous side posts, said rail and posts being secured together, two-section side posts between the continuous side posts, the lower sections of said two-section side posts being in a vertical plane with the belt rail and secured at their ends to the belt rail and side sill, and the upper sections thereof being in a vertical plane offset inwardly of the plane of the lower sections, inwardly directed extensions on the continuous side posts paralleling the upper sections of the sectional side posts, and members fixed to the ends of said sectional post upper sections projecting outwardly and being secured to the belt rail and roof plate.

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