June 28, 1966 W. B. McMULLIN 3,258,250

RAILING CONSTRUCTION

Filed July 17, 1963

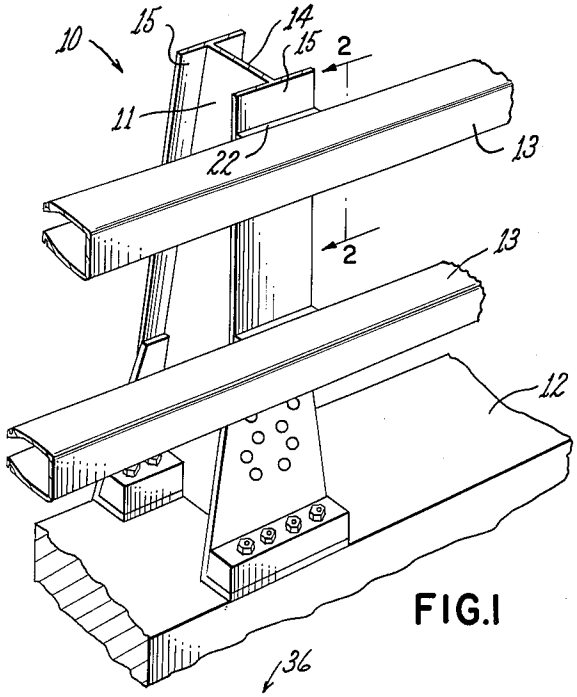


FIG.1

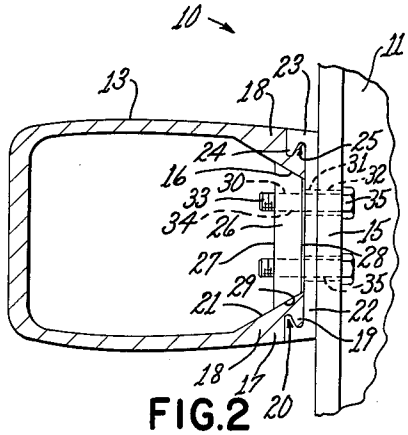


FIG.2

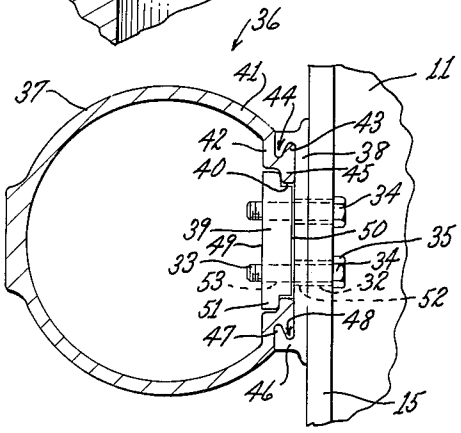


FIG.3

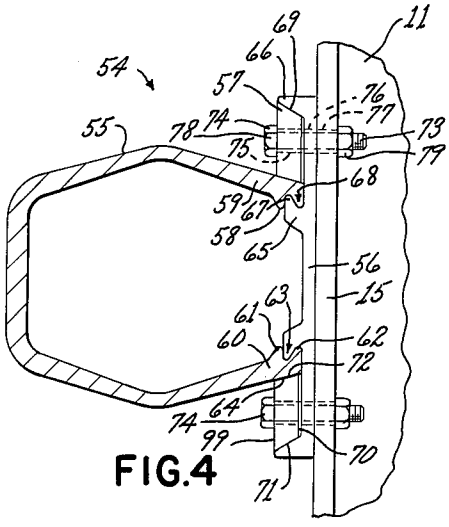


FIG.4

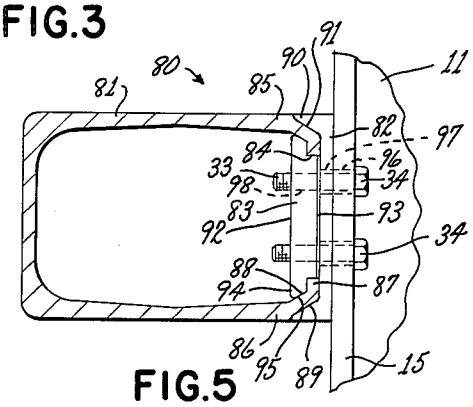


FIG.5

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RAILING CONSTRUCTION

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This invention relates to an improved railing construction as well as to an improved method for making such a railing construction or the like.

It is well known that metallic railing constructions have been provided for bridges and the like to provide guard means that prevent vehicles and the like from going over the side of the bridge or the like, such railing constructions also being utilized for other guard rail purposes and the like.

For example, such typical bridge railing constructions are fully disclosed in the co-pending patent application of Ernst J. De Ridder, Serial No. 216,211, filed August 10, 1962, and entitled "Railing Construction and Parts Therefor and Method of Making the Same or the Like."

This invention, however, provides improved means for securing the bridge rails or the like of such railing constructions to the vertically extending support posts or the like thereof and/or improved means for reinforcing such bridge rails or the like.

Accordingly, it is an object of this invention to provide an improved railing construction having one or more of the novel features of this invention hereinafter set forth or described.

Another object of this invention is to provide an improved method for making such a railing construction or the like.

Other objects, uses, and advantages of this invention are apparent from a reading of this description which proceeds with reference to the accompanying drawings forming a part thereof and wherein:

FIGURE 1 is a fragmentary perspective view illustrating a typical bridge railing construction or the like provided by this invention.

FIGURE 2 is an enlarged, fragmentary, cross-sectional view taken on line 2—2 of FIGURE 1.

FIGURES 3–5 are respectively views similar to FIGURE 2 and respectively illustrate other embodiments of this invention.

While the various features of this invention are hereinafter described and illustrated as being particularly adaptable for forming bridge railing constructions or the like, it is to be understood that the various features of this invention can be utilized singly or in any combination thereof to provide other constructions as desired.

Therefore, this invention is not to be limited to only the embodiments illustrated in the drawings, because the drawings are merely utilized to illustrate one of the wide variety of uses of this invention.

Referring now to FIGURE 1, an improved bridge railing construction of this invention is generally indicated by the reference numeral **10** and comprises a plurality of support posts **11** or the like vertically supported on a footer structure **12** at one side of the roadbed or the like and carrying a plurality of bridge rails **13** in a manner hereinafter described to complete the railing construction **10**.

The support post **11** can comprise any suitable structure and be formed in any suitable manner. For example, the support post **11** can be formed in a manner similar to the support post disclosed in the aforementioned co-pending patent application.

In particular, the support post **11** is substantially H-shaped in cross section to define a vertically extending web-like portion **14** integrally carrying transversely disposed flanges **15** at the ends thereof which respectively extend in opposite directions from the web-like portion **15**.

The flanges **15** of the suport post **11** are secured to the footer **12** of the roadbed or the like in any suitable manner, such as in the manner set forth in the aforementioned co-pending patent application, and such attaching means do not form a part of this invention other than that some means are provided to hold the support post **11** in a vertical position above the ground.

One means of this invention for mounting each bridge rail **13** to the support post **11** will now be described and reference is made to FIGURE 2.

As illustrated in FIGURE 2, the rail **13** can be formed in any suitable configuration and of any suitable material. For example, the rail **13** can be formed by extruding metallic material, such as aluminum-containing metallic material or the like, in a conventional extruding apparatus.

The rail **13** has a longitudinal opening or slot **16** extending from the opposed ends thereof at one side **17** of the rail **13** and defining opposed end portions **18**.

Each end portion **18** has an outwardly directed tongue **19** and an adjacent, outwardly facing groove **20** on the outer side thereof and an inwardly slanting surface **21** on the inner side thereof for a purpose hereinafter described.

A first reinforcing member **22** is provided and has a pair of outwardly directed flanges **23** at the opposed ends thereof, each flange **23** having an inwardly directed tongue **24** complementary to a groove **20** in an end portion **18** of the rail **13** and having an adjacent, inwardly facing groove **25** complementary to a tongue **19** of an end portion **18** of the rail **13**.

The reinforcing member **22** can be formed of any suitable material and in any suitable manner. For example, the reinforcing member **22** can be formed by extruding metallic material, such as aluminum-containing metallic material or the like, in conventional extruding apparatus.

The reinforcing member **22** is assembled to the rail **13** by telescoping the same on the opposed ends **18** thereof at one end of the rail **13** and by sliding the reinforcing member **22** relative thereto until the same is in a position to be disposed against the forward flange **15** of the support post **11** in the manner illustrated in FIGURE 2, the tongues **19** of the end portions **18** of the rail **13** being received in the grooves **25** of the flanges **23** of the reinforcing member **22** while the grooves **20** of the end portions **18** of the rail **13** receive the tongues **24** of the reinforcing member **22** whereby the reinforcing member **22** is interlocked to the rail **13**.

After the reinforcing member **22** has been moved to the proper longitudinal position relative to the rail **13** in the above manner, a second reinforcing member **26** is inserted in the opening **16** of the rail **13** and positioned behind the first reinforcing member **22**, the second reinforcing member **26** having a substantially trapezoidal cross-sectional configuration defined by opposed flat surfaces **27** and **28** joined together by slanting side surfaces **29** adapted to be complementary to the slanting surfaces **21** of the end portions **18** of the rail **13** in the manner illustrated in FIGURE 2.

The reinforcing member **26** can be formed of any suitable material and in any suitable manner. For example, the reinforcing member **26** can be formed by extruding metallic material, such as aluminum-containing metallic material or the like, in conventional extruding apparatus.

The reinforcing member **26** has a plurality of threaded bores **30** passing therethrough adapted to be aligned with bores **31** formed through the reinforcing member **22** and bores **32** formed through the front flange means **15** of the

support posts 11 whereby threaded ends 33 of bolt means 34 are adapted to pass through the aligned bores 32 and 31 and be threadedly received in the bores 30 of the reinforcing member 26 to compact the reinforcing members 22, 26 and rail 13 against the front flange 15 of the post 11 as the enlarged heads 35 of the bolt means 34 engage against the rear side of the front flange 15 of the support post 11 in the manner illustrated in FIGURE 2.

Thus, it can be seen that upon tightening the bolt means 34 in FIGURE 2, the reinforcing member 26 is drawn toward the reinforcing member 22 to cause the slanting surfaces 29 of the reinforcing member 26 to wedge against the slanting surfaces 21 of the end portions 18 of the rail 13 and compact the same against the reinforcing member 22 and, thus, to compact the reinforcing member 22 against the flange 15 of the post 11.

In this manner, the reinforcing member 26 cooperates with the reinforcing member 22 to substantially sandwich the end portions 18 of the rail 13 therebetween to frictionally hold the rail 13 from longitudinal movement relative to the reinforcing members 22 and 26 and, thus, relative to the post 11 whereby the bolt means 34 effectively secure the rail 13 to the post 11 in a relatively simple and non-time consuming manner.

Thus, it can be seen that the rails 13 of this invention are adapted to be secured to the support post 11 by the reinforcing members 22 and 26 in such a manner that the rails 13 can be readily detached from the support post 11 to replace the same when the original rails 13 have become damaged or the like.

While the reinforcing members 22 and 26 are previously described as being utilized to secure the rails 13 to the support posts 11, it is to be understood that the reinforcing means 22 and 26 could be utilized in the above manner to form reinforcing means for the rail 13 at points intermediate adjacent posts 11 or the like.

For example, the reinforcing member 22 can be longitudinally telescoped in the above manner to a position on the rail 13 whereby the same will be disposed between adjacent posts 11 or other supporting structure.

Thereafter, the reinforcing member 26 can be inserted in the opening 16 of the rail 13 and be positioned behind that particular reinforcing means 22.

Subsequently, the bolt means 34 can be utilized to interconnect together reinforcing means 22 and 26 by having the enlarged heads 35 of the bolt means 34 engage against the rear surface of the reinforcing member 22 so that upon tightening of the bolt means 34, the reinforcing member 26 is drawn toward the reinforcing member 22 to compact the end portions 18 of the rail 13 therebetween to hold the reinforcing members 22 and 26 from longitudinal movement relative to the rail 13.

In this manner, the reinforcing members 22 and 26 can be utilized to reinforce the rail 13 not only at the support posts 11, but also to reinforce the rails 13 at points intermediate adjacent support posts 11, if desired.

Another railing construction of this invention is generally indicated by the reference numeral 36 in FIGURE 3, wherein another rail 37 of this invention is secured to the support posts 11 by a pair of reinforcing means 38 and 39 in a manner now to be described.

The rail 37 has an opening or slot 40 formed in the side 41 thereof and extending to the opposed ends of the rail 37 in the same manner as the opening 16 previously described, the opening 40 being defined by opposed end portions 42 of the rail 37.

Each end portion 42 of the rail 37 has an outwardly directed tongue 43 and an adjacent, outwardly directed groove 44 formed in one side thereof and an inwardly directed flange 45 formed on the other side thereof for a purpose hereinafter described.

The reinforcing member 38 has a pair of outwardly directed flanges 46 respectively provided with inwardly directed tongues 47 complementary to the grooves 44 of the end portions 41 of the rail 37 and adjacent, inwardly

directed grooves 48 complementary to the tongues 43 of the end portions 41 of the rail 37.

In this manner, the reinforcing member 38 is adapted to be longitudinally interlocked to the rail 37 by inserting the same on one end of the rail 37 and having the tongues 43 of the end portions 41 of the rail 37 received in the grooves 48 thereof while the tongues 47 of the reinforcing member 38 are received in the grooves 44 of the rail 37.

Thus, the reinforcing member 38 can be longitudinally adjusted on the rail 37 until the same is positioned thereon in a position to be disposed against the forward flange 15 of the support post 11 in the manner previously described.

Thereafter, the second reinforcing member 39 is inserted in the opening 40 of the rail 37 and positioned behind the reinforcing member 38, the reinforcing member 39 having opposed flat surfaces 49 and 50 and outwardly directed shoulder means 51 for a purpose hereinafter described.

After the reinforcing member 39 has been positioned behind the reinforcing member 38, the bolt means 34 can have the threaded portions 33 thereof respectively passed through aligned bores 32 and 52 formed in the flange 15 of the post 11 and the reinforcing member 38 to be threadedly received in bores 53 formed through the reinforcing member 39.

Thus, after the enlarged heads 35 of the bolt means 34 have been disposed against the rear surface of the front flange 15 of the post 11 in the above manner, further tightening of the bolt means 34 causes the reinforcing member 39 to be drawn toward the reinforcing member 38 in such a manner that the shoulder means 51 of the reinforcing member 39 compact against the flanges 40 of the end portions 41 of the rail 37 to compact the same against the reinforcing member 38 and, thus, compact the reinforcing member 38 against the flange 15 of support post 11 whereby the frictional clamping force of the reinforcing member 39 holds the rail 37 from longitudinal movement relative to the reinforcing members 39 and 38 and, thus relative to the support post 11.

Therefore, it can be seen that the reinforcing members 38 and 30 can be utilized to secure the rail 37 to the support post 11 in substantially the same manner as the reinforcing members 22 and 26 previously described except that the reinforcing members 38 and 39 clamp the rail 37 to the support post 11 while the reinforcing members 22 and 26 wedge the rail 13 to the support post 11.

Also, it can be seen that the reinforcing members 38 and 39 of this invention can be utilized to reinforce the rail 37 intermediate adjacent support post 11 in substantially the same manner that the reinforcing members 22 and 26 can reinforce the rail 13 between the support posts 11, if desired.

Another railing construction of this invention is generally indicated by the reference numeral 54 in FIGURE 4, wherein a rail 55 is secured to the support post 11 by a first reinforcing means 56 and a second reinforcing means 57 in a manner now to be described.

The rail 55 has an opening or slot 58 formed in one side 59 thereof, the opening 58 extending to the opposed ends of the rail 55 and defining opposed end portions 60 of the rail 55.

Each end portion 60 of the rail 55 has a pair of inwardly directed tongues 61 and 62 on one side thereof which define inwardly facing grooves 63 therebetween. The other side of each end portion 60 of the rail 55 has an inwardly slanting surface 64 for a purpose hereinafter described.

The reinforcing member 56 has a first pair of outwardly directed flanges 65 and a second pair of outwardly directed flanges 66 disposed outboard of the flanges 65, the flanges 65 each having an outwardly directed tongue 67 complementary to a groove 63 of an end portion 59 of the rail 55 and an outwardly facing groove 68 comple-

mentary to the tongue 68 of the adjacent end portion 59 of the rail 55.

Each flange 66 of the reinforcing member 56 has a slanting inner surface 69 for a purpose hereinafter described.

The reinforcing member 56 is adapted to be interlocked on the rail 55 by inserting the same at one end of the rail 55 in such a manner that the tongues 67 of the flanges 65 thereof are received in the grooves 63 of the end portions 59 of the rail 55 while the tongues 68 of the rail 55 are received in the grooves 68 of the reinforcing member 56.

In this manner, the reinforcing member 56 is adapted to be longitudinally adjusted relative to the rail 55 until the same is in a position to be disposed against the front flange 15 of the support post 11.

Thereafter, the reinforcing means 57 are utilized to secure the rail 55 from longitudinal movement relative to the reinforcing member 56 and to the support post 11.

In particular, each reinforcing member 57 has opposed flat surfaces 99 and 70 respectively interconnected by opposed slanting side surfaces 71 and 72, the slanting side 72 of the reinforcing member 57 being complementary to the slanting side 64 of the end portion 59 of the rail 55 while the slanting side 71 of the reinforcing member 57 is complementary to the slanting surface 69 of the flange 66 of the reinforcing member 56.

Each reinforcing member 57 is disposed outboard of the rail 55 between the adjacent end portion 59 of the rail 55 and the flange 56 of the reinforcing member 56 so that a threaded portion 73 of a bolt means 74 can be respectively passed through bores 75, 76 and 77 respectively formed in aligned relation in the reinforcing member 57, reinforcing member 56 and the front flange 15 of the post 11.

In this manner, the enlarged head 78 of each bolt means 74 is adapted to be disposed against the surface 99 of its respective reinforcing member 57 and a suitable nut 79 can be threaded on the other end of the bolt means 74 to be compacted against the inside surface of the flange 15 of the post 11 in the manner illustrated in FIGURE 4.

Thus, upon tightening of the nut 79, the nut 79 cooperates with the enlarged head 78 on the particular bolt means 74 to compact the respective reinforcing member 57, reinforcing member 56 and flange 15 of the post 11 together, whereby the reinforcing member 57 is drawn toward the flange 15 of the post 11.

As the particular reinforcing member 57 is drawn toward the post 11, the slanting surface 71 thereof wedges against the slanting surface 69 of the flange 66 of the reinforcing member 57 to not only compact the reinforcing member 56 against the flange 15 of the post 11, but also causes the reinforcing member 57 to be wedged inwardly toward the rail 55 due to the looseness of the bore 75 in the reinforcing member 57 to tightly wedge the respective end portion 59 of the railing 55 against the flange 65 of the reinforcing member 56.

In this manner, the rail 55 is held, by the frictional engagement between the reinforcing members 57 and 56, from longitudinal movement relative to the reinforcing members 57 and 56 and, thus, from longitudinal movement relative to the post 11.

Thus, it can be seen that the rail 55 can be secured to the post 11 by the reinforcing means 56 and 57 in a simple and effective manner whereby no threaded bores are required in the reinforcing means 56 and 57 or the post 11 and the reinforcing members 57 can be assembled to the rail 55 without requiring insertion thereof inside the rail 55 in the manner required by the railing constructions 11 and 36 previously described.

In addition, it can be seen that the reinforcing members 56 and 57 can be utilized to reinforce the rail 55 at points intermediate with support posts 11 in the above manner, if desired.

Another railing construction of this invention is generally indicated by the reference numeral 80 in FIGURE 5, and is formed by securing a rail 81 to the support post 11 by reinforcing means 82 and 83 in a manner hereinafter described.

The rail 81 has an opening or slot 84 formed in the side 85 thereof and extending between the opposed ends thereof, the opening 84 defining opposed end portions 86 of the rail 81.

Each end portion 86 of the rail 81 has an inwardly directed flange 87 and an adjacent slanting surface 88 on one side thereof and a slanting surface 89 on the other side thereof for a purpose hereinafter described.

The reinforcing member 82 has a pair of outwardly directed flanges 90 respectively having slanting surfaces 91 cooperable with the slanting surfaces 89 of the end portion 86 of the rail 81 in the manner illustrated in FIGURE 5.

Thus, the rail 81 can be moved transversely relative to the reinforcing member 82 to have the end portions 86 thereof overlap the flanges 90 of the reinforcing member 82 without requiring longitudinal movement between the rail 81 and reinforcing member 82 in the manner provided by the other railing constructions of this invention.

Accordingly, the reinforcing member 82 can be placed against the flange 15 of the support post 11, and the rail 81 can be moved transversely toward the post 11 to have the end portions 86 thereof overlap the flanges 80 of the reinforcing member 82.

Thereafter, or before, the reinforcing member 83 is disposed in the opening 84 of the rail 81 so that the same is disposed in a position to be disposed behind the reinforcing member 82 when the rail 81 is in the proper position relative to the post 11.

The reinforcing member 83 has opposed flat surfaces 92 and 93 and outwardly directed shoulder means 94 respectively provided with slanting surfaces 95 for a purpose hereinafter described.

The bolt means 34 previously described can be utilized to sceure the members 82, 83 and 81 to the support post 11 by having the threaded portions 33 thereof respectively passed through bores 96 and 97 formed in aligned fashion in the flange 15 of the support post 11 and the reinforcing member 82 to be threadedly received in threaded bores 98 formed through the reinforcing member 83.

Thus, as the enlarged heads 35 of the bolt means 34 are disposed against the inner surface of the flange 15 of the support posts 11 and the bolt means 34 are further tightened, the reinforcing member 83 is drawn toward the support post 11 to not only cause the slanting surfaces 95 of the shoulder means 94 thereof to wedge against the slanting surfaces 88 of the end portions 86 of the rail 81 and wedge the end portions 86 against the slanting surfaces 91 of the flanges 90 of the reinforcing member 82, but also cause the shoulder means 94 of the reinforcing member 83 to clamp the flanges 87 of the end portions 86 of the rail 81 against the reinforcing member 82 to compact the reinforcing member 82 against the flange 15 of the support post 11.

Thus, frictional engagement caused by the wedging and clamping action of the reinforcing member 83 holds the rail 81 from longitudinal movement relative to the reinforcing members 83 and 82 and, thus, longitudinal movement relative to the support posts 11.

Therefore, it can be seen that the rail 81 can be simply and effectively secured to the support post 11 in a non-time consuming manner while the reinforcing members 82 and 83 reinforce the rail 81 at the post 11.

In addition, the reinforcing members 82 and 83 can be utilized in substantially the same manner as set forth above to reinforce the rail 81 at points disposed intermediate adjacent support posts 11, if desired.

Therefore, it can be seen that improved railing constructions are provided by this invention as well as improved methods for making the same or the like.

While the form of the invention now preferred has been disclosed as required by statute, other forms may be used, all coming within the scope of the claimed subject matter which follows.

What is claimed is:

1. In combination, a bridge rail or the like having an opening in one side thereof defined by opposed outwardly directed end edge portions of said rail, each portion having a tongue and groove on one side thereof and a slanting surface on the other side thereof, a first reinforcing means receiving said portions of said rail and having flanges respectively overlapping said portions and being disposed inboard of said portions, each flange having a tongue received in said groove of a respective edge portion and having a groove receiving said tongue of said respective edge portion, said first reinforcing means having slanting surfaces disposed outboard of said portions, and a pair of second reinforcing members disposed outside said rail and being secured to said first means, each member having a slanting surface disposed in wedging relation with a slanting surface of said first means and the end portions to wedge the respective portion of said rail against the respective flange of said first means.

2. In combination: a bridge rail or the like having an opening in one side thereof defined by opposed outwardly directed end edge portions of said rail terminating at end surfaces that are the outermost portions of said rail, a first reinforcing means receiving said portions of said rail, and a second reinforcing means secured to said first means and interlocking said portions to said first means, said first reinforcing means overlapping said portions outboard of said rail and said second reinforcing means overlapping said portions inboard of said rail, said first reinforcing means having slanting surfaces on said overlapping portions thereof, said second reinforcing means having slanting surfaces and flat surfaces on said overlapping portions thereof, said end edge portions of said rail each having inner and outer slanting surfaces wedged between adjacent slanting surfaces of said first and second reinforcing means and having an inturned end clamp between an adjacent flat surface of said second reinforcing means and said first reinforcing means whereby said second reinforcing means both clamps and wedges said end edge portions of said rail against said first reinforcing means.

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