RAILING CONSTRUCTIONS AND PARTS THEREOF OR THE LIKE

John S. Case, Towson, Md., and James E. Belcher, Jr., Henrico County, Va., assignors to Reynolds Metals Company, Richmond, Va., a corporation of Delaware

Filed Nov. 5, 1965, Ser. No. 506,534
14 Claims. (Cl. 256—24)

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a railing construction wherein a panel arrangement is secured to and between a pair of adjacent support posts, the panel arrangement having an upper frame member that is received in facing channels of the support posts and is provided with a transverse web that directly rests on the tops of the support posts to suspend the panel arrangement between the support posts.

This invention relates to improved railing constructions and to improved parts for such railing constructions or the like.

Therefore, railing constructions or the like have been formed of complicated structures and assembled and fabricated by complicated procedures whereby an attractive versatile railing construction was difficult to achieve.

However, by following the teachings of this invention, an improved, attractive and versatile railing construction can be provided by utilizing the improved parts of this invention.

Another feature of this invention is to permit the panel means which are to be secured between adjacent vertically extending support posts to be prefabricated at the factory or the like whereby the same can be shipped in prefabricated condition to be readily utilized between the support posts located at the desired location, the panel means of this invention and support posts being so constructed and arranged that field cutting thereof to compensate for minor errors and bowing of the panel constructions is completely eliminated because of the adjustable attaching means between the panel means and support posts of this invention.

In particular, the panel means of this invention includes an upper frame member that has opposed ends adapted to be telescopically received in inwardly facing channels of a pair of adjacent, spaced support posts while having a transverse web thereof directly resting on the top of the upper ends of the support posts to suspend the panel means therebetween. The upper frame member can include downwardly extending flanges that overlap flanges of the support posts and be secured thereto by fastening means passing through the overlapping portions of the flanges of the upper frame member and the support posts. In this manner, misalignment between the support posts and panel means will be compensated for by the degree of telescopic relation between the facing channels of the support posts and the opposed ends of the upper frame member of the panel means.

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

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

Other objects, and features of this invention and the like, will become apparent from the following description which proceeds with reference to the accompanying drawings forming a part thereof and wherein:

FIGURE 1 is a fragmentary, perspective schematic view illustrating one embodiment of the railing construction of this invention.

FIGURE 2 is an enlarged, fragmentary view illustrating the method of forming one of the parts of the railing construction of FIGURE 1.

FIGURES 3—6 are views similar to FIGURE 2 and respectively illustrate the methods of forming other parts of the railing construction of FIGURE 1.

FIGURE 7 is an enlarged, fragmentary, cross-sectional view taken on line 7—7 of FIGURE 1.

FIGURE 8 is a perspective view illustrating one of the fastening members utilized in the construction of FIGURE 9.

FIGURE 9 is an enlarged, fragmentary, cross-sectional view taken on line 9—9 of FIGURE 1.

FIGURE 10 is a perspective view illustrating another embodiment of the fastening member illustrated in FIGURE 8.

FIGURE 11 is an enlarged, partial, cross-sectional view taken on line 11—11 of FIGURE 1 except that the capping member thereof is removed.

FIGURE 12 is an enlarged, cross-sectional view taken on line 12—12 of FIGURE 1 with the capping members removed.

FIGURE 13 is a fragmentary, cross-sectional view taken on line 13—13 of FIGURE 12.

FIGURE 14 is a side view of one of the panel means utilized in the railing construction of FIGURE 1.

FIGURE 15 is an enlarged, fragmentary, cross-sectional view taken on line 15—15 of FIGURE 1 with the capping member removed.

FIGURE 16 is an enlarged, fragmentary, cross-sectional view taken on line 16—16 of FIGURE 1 with the handrail thereof removed.

FIGURE 17 is an end view illustrating a capping member similar to FIGURE 5 secured to the extrusion of FIGURE 4.

FIGURE 18 is a view similar to FIGURE 12 and illustrates another embodiment of this invention.

FIGURE 19 is a front view of a preassembled panel section for forming the railing construction of FIGURE 1.

FIGURE 20 is a fragmentary front view of another railing construction of this invention.

FIGURE 21 is an enlarged fragmentary top view, partially broken away, of the structure illustrated in FIGURE 20.

FIGURE 22 is an enlarged, fragmentary, partially broken away side view of the structure illustrated in FIGURE 20.

FIGURE 23 is a fragmentary, cross-sectional view taken on line 23—23 of FIGURE 22.

FIGURE 24 is a fragmentary, cross-sectional view taken on line 24—24 of FIGURE 22.

FIGURE 25 is an enlarged, fragmentary, partially broken away side view of the structure illustrated in FIGURE 20.

FIGURE 26 is a fragmentary, cross-sectional view taken on line 26—26 of FIGURE 25.

FIGURE 27 is a fragmentary, cross-sectional view taken on line 27—27 of FIGURE 25.

FIGURE 28 is a schematic perspective view illustrating the method of forming one of the parts of the railing construction illustrated in FIGURE 20.

FIGURE 29 is an end view of the part illustrated in FIGURE 28 having the channel thereof closed by a cover means of this invention.

FIGURE 30 is a view similar to FIGURE 20 and illustrates another embodiment of this invention.

FIGURE 31 is an enlarged, cross-sectional view taken on line 31—31 of FIGURE 30.
FIGURE 32 is an enlarged, cross-sectional view taken on line 32—32 of FIGURE 30.
FIGURE 33 is an enlarged, fragmentary, partially broken away view of part of the structure illustrated in FIGURE 30.
FIGURE 34 is a fragmentary, perspective view illustrating the forming of a part of the structure illustrated in FIGURE 30.
FIGURE 35 is a view similar to FIGURE 20 and illustrates another embodiment of this invention.
FIGURE 36 is an enlarged, cross-sectional view taken on line 36—36 of FIGURE 35.
FIGURE 37 is an enlarged, fragmentary, partially broken away view of part of the railing construction illustrated in FIGURE 35.
FIGURE 38 is a view similar to FIGURE 20 and illustrates another railing construction of this invention.
FIGURE 39 is an enlarged, fragmentary, cross-sectional view taken on line 39—39 of FIGURE 38.
FIGURE 40 is an enlarged, cross-sectional view taken on line 40—40 of FIGURE 38.

While the various features of this invention are hereinafter described and illustrated as being particularly adapted for forming a railing construction 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 railing construction of this invention is generally indicated by the reference numeral 30 and comprises a plurality of substantially vertically extending posts 31, the posts 31 being vertically supported by having the lower ends thereof embedded in a foundation structure A or the like.

If desired, the posts 31 can form the terminal portions of the railing construction 30 or one of both of the ends of the railing construction 30 can be interconnected to vertically extending structure 31.' An upper framing member 32 and a lower framing member 33 respectively extend between adjacent posts 31 or vertical structures 31 and are secured thereto in a manner hereinafter described, the upper and lower framing members 32 and 33 having inwardly facing channels 31 for a purpose hereinafter described.

A pair of upright framing members 34 extend between each pair of upper and lower framing members 32 and 33 in spaced relation relative to the posts 31 or vertical structure 31; the upright framing members 34 also having inwardly facing channels.

In this manner each set of framing members 32, 33 and 34 define a substantially rectangular area receiving a panel means 35 having the edges thereof respectively received in the inwardly facing channels of the framing members 32, 33 and 34, the panel means 35 being secured to the framing members 32, 33 and 34 in a manner hereinafter described.

The obstructed channels in the framing members 32, 33 and 34 as well as the outwardly facing channels of the support posts 31 are subsequently closed by capping members 36 of this invention in a manner hereinafter described to hide various fastening means and provide an attractive structure, it being understood that the capping members 36 for the support posts 31 are wider than the capping members of the framing members 32, 33 and 34 even though the same have the same general configuration and function.

A suitable handrail 37 or the like is secured to the upper framing member 32 in a manner hereinafter described to complete the railing construction 30 of this invention.

Not only is the completed railing construction 30 attractive in design, strong and long lasting, but also the railing construction 30 is relatively simple to manufacture and assemble in a manner to be described whereby the railing constructions 30 of this invention are relatively inexpensive.

For example, prefabricated panel construction B illustrated in FIGURE 19 can be formed at a factory or the like to a user's specific specifications. Panel construction B includes the framing members 32, 33 and 34 together with the interconnected panel means 35 so that the same can be shipped to the site along with the support posts 31 so that when the support posts 31 have been secured in the desired supporting structure A, the prefabricated panel means B can be joined between the support posts 31 in a manner hereinafter described without requiring field cutting of the prefabricated panel means B because of the unique arrangement of this invention which permits adjustments to be made between the prefabricated panel means B and the support posts 31.

For example, it has been found that even though the framing members 32 and 33 of the prefabricated panel means B have been formed to desired specifications wherein the same will just fit between adjacent support posts 31, the panel means 35 of this invention are placed under tension in a manner hereinafter described whereby the same will tend to bow the framing members 32 and 33 so that the same would not fit the support posts 31 if the support posts 31 were not formed in accordance with the teachings of this invention whereby in the past the prefabricated panel means B had the framing members 32 and 33 thereof cut extra long so that when the same bowed the particular degree of bowing could be compensated for by cutting off an appropriate amount of the framing members 32 and 33 in the field when the prefabricated panel means B would be utilized with preset support posts 31.

However, according to the teachings of this invention, no field cutting is required on the framing members 32 and 33 of the prefabricated panel means B because the support posts 31 of this invention permit relative adjustments to be made without field cutting the framing members 32 and 33 as will be apparent hereinafter.

Further, while the railing construction 30 illustrated in FIGURE 1 has a particular configuration, it is to be understood that this invention is not to be limited to such configuration because the various parts of this invention can be arranged in many different patterns to provide a variety of railing construction having any desired configuration.

While the posts 31, framing members 32, 33 and 34, capping members 36 and handrails 37 can be formed in any suitable manner and of any suitable material, the embodiments thereof illustrated in the drawings are formed by extruding metallic material, such as aluminum containing magnesium metal material in the art whereby the cost of making such parts are held to a minimum.

In particular, reference is made to FIGURE 2 wherein a suitable length of handrail stock 37 is extruded by a conventional extruding apparatus 38.

As illustrated in FIGURE 2, the handrail stock 37 has a substantially inverted U-shaped cross-sectional configuration defined by an upper arcuate cross member 39 having a pair of depending legs 40 extending from the opposed ends thereof, the legs 40 being substantially arcuate and having the free ends 41 thereof directed slightly inwardly as illustrated in FIGURE 2.

The overall exterior surface of the handrail stock 37 is defined by curving smooth continuous surface means to prevent sharp edges which would tend to be hazardous when subsequently grasped by a user or the like.

The handrail stock 37 has an inwardly directed abutment 42 on each leg 40 spaced from the free end 41 thereof and having a flat surface 43 disposed coplanar with the inner end of the free end 41 of the respective leg 40 for a purpose hereinafter described.

In addition, the cross member 39 of the handrail stock 37 has a pair of inwardly directed abutment successively defined substantially flat surfaces adapted to be
disposed horizontal when the handrail stock 37 is utilized in a manner hereinafter described. A pair of flanges 46 extend downwardly from the central portion of the cross member 39 of the handrail stock 37 and are spaced from each other a predetermined distance, the inside surfaces of the flanges 46 being provided with serrations adapted to hold the threaded portion of a bolt subsequently received in the channel 48 defined between the flanges 46 in a manner hereinafter described.

As illustrated in FIGURE 3, the upper framing member stock 32 may be extruded by a conventional extruding apparatus 49 in a manner well known in the art and comprises a substantially double T-shaped member having an upper stepped cross member 50 and a pair of spaced and parallel like depending legs 51 intermediate the ends of the cross member 50. The cross member 50 has an intermediate portion 52 integrally joined to the legs 51 at a point below the upper ends 53 of the legs 51, the upper ends 53 of the legs 51 being integrally joined to outer portions 54 of the cross member 50. A pair of flanges 55 are joined to the free ends of the outer portions 54 of the cross member 50 and respectively have inwardly turned ends 56 and substantially straight and parallel lower ends 57.

The free ends 58 of the legs 51 have beveled surfaces 59 and V-shaped channels 60 throughout the length thereof for a purpose hereinafter described. In addition, the outer surfaces of the legs 51 have small V-shaped channels 61 throughout the length thereof.

The flanges 55 of the upper framing member stock 32 have V-shaped grooves 62 on the outer surface thereof and extending throughout the length thereof for a purpose hereinafter described, the flanges 55 cooperating with the legs 51 to define a downwardly facing channel 63 for a purpose hereinafter described. Each flange 55 has inwardly directed abutments 64 and 65 disposed in aligned relation and projecting in the channel 63 for a purpose hereinafter described.

As illustrated in FIGURE 4, the lower framing member stock 33 may be extruded by a conventional extruding apparatus 66, the extruded stock 33 having substantially the same cross-sectional configuration as the upright framing member stock 34 except that the upright framing members 34 are narrower than the lower framing members 33 as will be apparent hereinafter.

Therefore, the following description which relates to the lower framing member stock 33 also applies to the upright framing member stock 34.

The lower framing member stock 33 has a substantially H-shaped cross-sectional configuration defined by a pair of flanges 67 interconnected together intermediate the opposed ends thereof by an intermediate web 68.

The intermediate web 68 of the lower framing member stock 33 is offset toward one of the ends of the flanges 67 whereby the intermediate web 68 cooperates with the flanges 67 to define opposed outwardly facing channels 69 similar to the downwardly facing channel 69 defined between the legs 51 of the upper framing member stock 32 for a purpose hereinafter described.

Each flange 67 of the lower framing member stock 33 has a pair of longitudinally disposed grooves 70 formed inboard of the opposed ends 71 and 72 thereof for a purpose hereinafter described, the grooves 70 on each flange 67 being provided with beveled surfaces 73 which respectively face the beveled surfaces 73 of the other flange 67 and respectively having V-shaped cross-sectional configurations.

The opposed ends 71 and 72 of each flange 67 of the rail framing member stock 33 are provided with beveled surfaces 73 which respectively face the beveled surfaces 73 of the other flange 67 for a purpose hereinafter described.

As illustrated in FIGURE 5, the capping member stock 36 may be extruded by a conventional extruding apparatus 74 in a manner well known in the art, the capping member stock 36 comprising a flat web 75 having a pair of flanges 76 secured to the side 77 thereof and inboard of the opposed ends of the flat web 75.

Each flange 76 of the capping member stock 36 has an outwardly directed, substantially V-shaped enlargement 78 at the free end 79 thereof, the leading surface 80 of each enlargement 78 being continued to the free end 79.

The free end 79 of the surface 80 is disposed inboard of the trailing surface 81 relative to the inboard surface of the flange 76 for a purpose hereinafter described.

As illustrated in FIGURE 6, the post stock 31 is extruded by a conventional extruding apparatus 82 in a manner well known in the art, the post stock 31 defining a substantially outer rectangular cross-sectional configuration being defined by an intermediate cross member 83 integrally joined to the medial portions of a pair of parallel flanges 84. Each flange 84 has inwardly turned ends 85 directed toward the turned ends 86 of the other flange 84 whereby the flanges 84 cooperate with the intermediate web 83 to define outwardly facing and oppositely directed channels 86 for a purpose hereinafter described.

Each enlargement 85 on each end of the flanges 84 defines a flat inner surface 87 and a beveled surface 88 leading to a recess 89 adjacent the exterior surface of the enlargement 85 for a purpose hereinafter described.

When it is desired to form the raling construction 30 of this invention from the parts illustrated in FIGURES 2-6, the post stock 31 is cut into the desired lengths to form the integral posts 31 illustrated in FIGURE 1. Each post can be embedded in the foundation structure A whereby the posts 31 are substantially vertically supported by the foundation structure A. However, it is to be understood that the posts 31 can be vertically supported in any other suitable manner as desired.

Thereafter, the raling construction 30 is completed in the manner illustrated in FIGURE 1 by use of the framing members 32, 33 and 34, panel means 35, handrails 37 and capping member 36 in one or two manners.

In particular, the panel construction B illustrated in FIGURE 19 can be prefabricated in a manner herinafter described and shipped to the site where the posts 31 are to be erected in the above manner and the panel construction B are then fitted between and secured to vertically supported posts 31 in a manner hereinafter described.

Subsequently, the handrail structure 37 and capping members are utilized to complete the railing construction 30.

However, if desired, the panel construction B can be fabricated at the site as will be apparent hereinafter.

Each of the panel means 35, to be utilized in forming the raling construction 30 of this invention, is formed from a flexible wire mesh structure 90 as illustrated in FIGURE 14. The mesh structure is respectively secured to rods 91 disposed at each side of the rectangular mesh structure 90, the rods 91 not being interconnected together so that the rods 91 can be pulled outwardly to place the mesh structure 90 under tension in a manner herinafter described.

Each panel means 35 has a dimension slightly larger than the area subsequently defined by each set of secured framing members 32, 33 and 34 whereby the edges of the panel means 35 are respectively disposed in the inwardly facing channels 69 of the framing members 32, 33 and 34, the panel means 35 being interconnected channels 69 by suitably flexing the panel means 35 to telescope disposed the edges of the panel means 35 in the channels 69 of the framing members 32, 33 and 34 if the framing members 32, 33 and 34 are already secured together in a manner hereinafter described.

However, should the panel means 35 be a substantially rigid structure so that the same could not be flexed sufficiently to telescope the edges thereof into the channels 69 of the erecting framing members 32, 33 and 34, the subassemblies B illustrated in FIGURE 19 could be fabri-
cated without interconnecting the upper framing member 32 in place until after the panel means 35 had been vertically inserted into the channels 69 of the erected up-right framing members 34 and the lower framing members 33.

When it is desired to form the individual pre-assembled panel means B illustrated in FIGURE 19, to be subsequently secured between adjacent vertical structures 31, the upper and lower framing members 32 and 33 are cut to the desired lengths and the upright framing members 34 are cut to the desired lengths and secured to the framing members 32 and 33 in the manner illustrated in FIGURES 12 and 13.

In particular, the framing members 34 are so constructed and arranged that the opposed ends 92 and 93 thereof are adapted to be respectively telescopically received in the inwardly facing channels 69 of the upper and lower framing members 32 and 33 so that the opposed ends 92 and 93 of each upright framing member 34 respectively abuts the flat webs 50 and 65 of the upper and lower framing members 32 and 33 at desired positions spaced inwardly from the free ends of the upper and lower framing members 32 and 33.

Each upright framing members 34 are disposed in the position illustrated in FIGURE 12, the intermediate webs 65 thereof being suitably apertured at 94 adjacent the ends 92 and 93 thereof so that the apertures 94 are adapted to respectively receive the curved ends 95 of the J-bolts 96 respectively passing through suitable apertures 97 formed therein. The flat webs 50 and 65 of the upper and lower framing members 32 and 33.

The J-bolts 96 each have a threaded end 99 which is adapted to receive a nut 100 whereby each J-bolt 96 is adapted to be pulled outwardly relative to the upright framing member 34 upon tightening of the nut 100 thereby causing the hook-like members 102 to grip against the edge of the aperture 94 in the upright framing member 34 to positively hold the upright framing member 34 in the proper position thereof.

Each J-bolt 96 is disposed closely adjacent the intermediate web 68 of the respective upright framing member 34 on the side thereof facing the adjacent upright framing member 34 whereby the J-bolts 96 not only secure the upright framing member 34 to the upper and lower framing members 32 and 33, but also the J-bolts 96 function to limit inward movement of the upright framing members 34 when the panel means 35 are secured thereto and subsequently placed under tension in a manner hereinafter described.

Thus, it can be seen that it is relatively simple to fasten the framing members 32, 33 and 34 together by means of the J-bolts 96 whereby a framing structure is provided and defines a rectangular area being bounded by the inwardly directed channels 69 of the interconnected framing members 32, 33 and 34.

After the framing members 32, 33 and 34 have been interconnected together by the J-bolts 96 in the manner previously described, the edges of the panel means 35 are telescoped into the inwardly facing channels 69 of the interconnected framing members 32, 33 and 34 whereby the panel means 35 is adapted to be secured in place and to be placed under tension in a manner now to be described.

The intermediate webs 68 of the upright framing members 34 and the intermediate web 68 of the lower framing member 33 are respectively provided with suitably spaced apertures 101 in the manner illustrated in FIGURE 15 whereby a hook-like member 102 is adapted to pass through the aperture 101 and have a nut 103 disposed on the threaded end 104 thereof so that the hooked portion 105 of each hook-like member 102 can be drawn toward the intermediate web 68 upon tightening of the nut 103.

Similarly, such hook-like members 102 are carried by the flat web 50 of the upper framing member 32, the hook-like members 102 passing through suitable apertures 106 formed therethrough.

The hook-like members 102 carried by the framing members 32, 33 and 34 are adapted to fit around the rods 91 of the panel means 35 so that upon tightening of the nuts 103 of the hook like members 102, the mesh structure 90 can be placed under tension so that the panel means 35 will provide a substantially rigid structure and complete the preassembled panel section B of FIGURE 19 to be subsequently secured to adjacent vertical structures or posts 31 in a manner hereinafter described.

As illustrated in the drawings, it can be seen that the peripheral edges of the panel means 35 are telescopically received in the inwardly facing channels 69 of the framing members 32, 33 and 34 so that any means securing the panel means 35 to the framing members 32, 33 and 34 are hidden in the channels 69 thereof to provide an attractive design.

The preassembled panel section B is adapted to be disposed between adjacent support posts 31 by telescopically the panel section B down between the inwardly facing channels 86 of adjacent support posts 31 by having the opposed ends of the lower framing member 33 fully received in the channels 86 thereof and pushed downwardly relative to the support posts 31 until the upper framing member 32 receives the upper end of the flanges 84 of the support posts 31 in the channels 86 thereof in the manner illustrated in FIGURE 7 whereby the panel means B is suspended between adjacent support posts 31 by having the outer portions 54 of the intermediate cross member 50 of the upper frame member resting on the upper ends of the support posts 31 in the manner illustrated in FIGURE 7.

Since the preassembled panel sections B have been fabricated at the factory, slight misalignment between the opposed ends of the upper and lower framing members 32 and 33 and the spacing between the support posts is bound to occur. However, because the upper and lower framing members 32 and 33 have the ends thereof received in the channels 86 of the support posts 31 in the manner illustrated in FIGURE 9, it can be seen that the framing members 32 and 33 can be moved toward and away from the intermediate web 83 of the support posts 31 to compensate for any misalignment thereof so that no field cutting is required to compensate for misalignment or for undue bowing of the upper and lower framing members 32 and 33 because of the tension of the panel means 35 in the manner previously described.

After the particular preassembled panel means B has the upper framing member 32 resting on the upper ends of adjacent support posts 31 in the manner illustrated in FIGURES 7 and 9, the fabrication takes a drill and places the bit in one of the grooves 62 on the outer surface of the flange 55 of the upper framing member 32 and drills through the same, through the adjacent flange 84 of the support post 31 through the legs 51 of the framing member 32, through the opposite flange 84 of the support post 31 and the other flange 55 of the upper framing member 32.

Thereafter, the fabricator inserts a pin 107 through the drilled apertures to fully interconnect the upper framing member 32 to the particular support post 31.

The other end of the upper framing member 32 can be likewise secured to the other adjacent support post 31 by the pin means 107 in the manner previously described.
Alternately, the upper framing member 32 can be secured to the particular support post 31 by utilizing threaded members threaded interconnecting the flanges 55 of the upper framing member 32 to each of the flanges 84 of the support post 31, if desired, in lieu of the pin means 107. Therefore, it can be seen that it is relatively simple to fasten the upper frame member 32 of the pressed assembly section B to the support post 31 after the particular panel section B has been telescoped in place and has been suspended between adjacent support posts 31 with the upper framing member 32 resting on the upper ends of the support posts 31.

In order to fasten the lower framing members 33 to adjacent support posts 31, any suitable means can be provided.

For example, fastening members 108, FIGURE 8, can be utilized to attach the lower framing members 33 to the support posts 31, the fastening members 108 each comprising an L-shaped member defined by two integrally connected legs 109 and 110 disposed at right angles relative to each other. Each fastening member 108 has the legs 109 and 110 thereof slotted respectively at 111 and 112 to receive fastening members in the manner illustrated in FIGURE 9.

Alternately, fastening members 113 of FIGURE 10 could be utilized, each fastening member 113 comprising an L-shaped member having integrally interconnected legs 114 and 115 disposed at right angles relative to each other and provided with a flat surface 116 or 117.

When it is desired to fasten an end of a lower framing member 33 to a support post 31, a leg 114 of a fastening member 113 is secured to an intermediate web 68 of the lower framing member 33 by a bolt means 118 while the other leg 115 of the fastening member 113 is secured to the intermediate web 63 of the support post 31 by a bolt means 119.

If desired, the adjacent ends of the lower framing members 33 of adjacent panel sections B can utilize the same bolt means 119 to fasten the opposing fastening members 113 to the intermediate web 63 of the support post 31 in the manner illustrated in FIGURE 9.

However, it is to be understood that the lower framing member 33 of each panel section B can be secured to the intermediate web 63 of the support post 31 by its own fastening member 113 and bolt means 119 if desired.

Therefore, it can be seen that the upper and lower framing members 32 and 33 of each panel section B can be fastened to the adjacent support posts 31 in a simple and unique manner wherein the fastening means are completely disposed within the channels 66 of the support posts 31 while the support posts 31 permit the panel sections B to be adjusted relative thereto so that the upper and lower framing members 33 need not be accurately cut to abut the intermediate web 63 of adjacent support posts 31. However, while FIGURE 9 illustrates the ends of the upper and lower framing members 32 and 33 being spaced from the intermediate web 63 of the support post 31, the free ends of the upper and lower framing members 32 and 33 could abut against the intermediate web 63 of the support post 31 if desired.

After the panel means B has been secured between adjacent support posts 31 in the above manner, the handrail members 37 are, in effect, snap fitted over the flanges 55 of the upper framing members 32 in the manner illustrated in FIGURE 11 whereby the abutting means 42 of the legs 40 of the handrail members 37 engage the flanges 55 of the upper framing members 32 and completely cover the pins 107 or other fastening means which fasten the upper framing members 32 to the support posts 31, the upper ends 56 of the flanges 55 of the upper framing members 32 bearing against the flat surfaces 45 of the enlargements 44 on the cross member 39 of the handrails 37.

Thereafter, a suitable aperture 120 is formed in the intermediate part 52 of the cross member 50 of the upper framing member 32 intermediate the support posts 31 and the upright framing members 34 whereby a suitable threaded fastening member 121 can be passed through the apertures 120 and be threadedly received between the flanges 46 of the handrail members 37 to fasten the handrail members to the cross member 50 of the upper framing members 32.

Therefore, it can be seen that a relatively simple method has been provided for firmly attaching the handrails 37 in place to complete the railing construction 30 of this invention.

Subsequently, all of the unfilled channels 69 and 86 in the framing members 32, 33, 34 and posts 31 are closed by appropriately dimensioned casing members 36 in the manner illustrated in FIGURES 17 and 1 so that all fastening means will be completely hidden from view to produce an attractive and ornamental railing construction.

In particular, reference is made to FIGURE 17 whereby it can be seen that the casing member 36 is adapted to be interconnected to the framing member 32, 33 or 34 or support post 31 to cover the unobstructed channels 69 and 86 thereof.

The casing members 36 are so constructed relative to the framing members 32, 33 and 34 and support posts 31 that the legs or webs 76 of the casing members 36 are adapted to be press fitted between the legs 51, 67 and 68 of the framing member 32, 33 and 34 and support posts 31 and have the flat webs 75 thereof abut the free ends of the legs and flanges of the framing members 32, 33 and 34 and support posts 31 to completely close the unobstructed portions of the channels 69 and 86 thereof.

As the legs 76 of a casing member 36 are about to be telescopically received in the unobstructed channel 69 of a particular framing member 32, 33 or 34 or the channel 86 of a support post 31, the leading surfaces 80 of the enlargements 78 of the legs 67 of the casing member 36 are adapted to be cammed inwardly by the beveled surfaces 59, 73, or 83 of the framing member 32, 33 or 34 or the support posts 31 to facilitate the ease of insertion of the legs 76 of the casing member 36 between the flanges 51, 67 or 84 of the framing members 32, 33 or 34 or support posts 31.

As the legs 76 of the casing members 36 are inserted in the channels 69 or 86, the enlargements 78 of the casing members 36 are eventually snapped outwardly into the slots 60, 70 of the framing members 32, 33 and 34 or beyond the flat surfaces 87 of the support posts 31 in the manner illustrated in FIGURE 17 whereby the casing members 36 are held in place and the flat webs 75 thereof abut against the free ends of the flanges 51, 67 or 84.

Since the free ends 79 of the leading surfaces 80 of the enlargements 78 of the casing members 36 are disposed intoaid of the trailing surfaces 81 relative to the inboard surfaces of the legs 76, it is more difficult to move the casing members 36 from the framing members 32, 33 and 34 and support posts 31 than it is to insert the casing members 36 therein.

If desired, the downwardly facing channels 69 of the lower framing members 33 could be closed by such casing members 36, if desired.

However, since the lower framing members 33 are normally disposed closely adjacent the supporting structure A, the downwardly facing and unobstructed channel 69 of the lower framing member 33 need not be covered by the casing members 36 because it would be relatively difficult to view the bottom of the lower framing members 33.

When the casing members 36 are disposed in place in the above manner, it can be seen that all of the fastening structures of this invention are completely closed from view whereby an attractive and ornamental railing construction 30 is provided by this invention.
Further the capping members 36 can be inserted in any unobstructed voids in the channels 69 of the framing members 32, 33 and 34 or be utilized as intermittent spacers when picket or spaced panels are utilized.

As a completely optional feature, the majority of the exposed surfaces of the framing members 32, 33 and 34, as well as any of the capping members 36, may be provided with serrated surfaces, or other suitable surface finishes, so that fingerprints and the like are substantially eliminated even though the parts are continually being handled during the assembly thereof and, thereafter, during the use of the railing construction 30 whereby the railing construction 30 will not be readily marked or marred.

While the railing construction 30 of this invention has been illustrated and described as having the upright framing members 34, adapted to be telescopically received in the upper and lower framing members 32 and 33, it is to be understood that the upright framing members 34 could be cut from the same stock as the lower framing members 33 to provide another railing construction of this invention.

In particular, reference is made to FIGURE 18 wherein a railing construction of this invention is generally indicated by the reference numeral 30A and parts thereof similar to railing construction 30 are indicated by like reference numerals followed by the reference letter A.

As illustrated in FIGURE 18, the upright framing members 34A, are cut from the same stock as the lower framing members 33A whereby the upright framing members 34A are each adapted to have the opposed free ends of the transverse webs 67A thereof abut the free ends of the transverse webs 51A and 67A of the upper and lower framing members 32A and 33A and be secured to in any suitable manner.

For example, the upright framing members 34A can be secured to the upper and lower framing members 32A and 33A by welding at 122 as illustrated in FIGURE 18.

Therefore, it can be seen that the entire railing constructions of this invention can be formed in a relatively few parts in a relatively simple and rapid manner to provide sturdy, long lasting and attractive railing constructions having many uses.

Further, that parts for forming the railing constructions of this invention can be made in a relatively simple and rapid manner by simple extrusion procedures.

Various terms "vertical" and "horizontal" are used herein, it is to be understood that such terms are not structural limitations of this invention, but are merely utilized for convenience of description for the particular position of the structure illustrated in the drawings.

While the railing construction 30 has been previously described in a particular configuration thereof, it is to be understood that the various parts of the railing construction 30 can be modified within the teachings of this invention to provide other types of railing constructions.

In particular, reference is now made to FIGURES 20-29 wherein another railing construction of this invention is generally indicated by the reference numeral 123 and parts thereof similar to the railing construction 30 are indicated with like reference numerals.

For example, the railing construction 123 includes a plurality of panel means 133 each including an upper frame member 32, a lower frame member 33 and a pair of upright frame members 34 interconnected to the upper and lower frame members 32 and 33 in the manner previously described whereby the frame members 32, 33 and 34 hold the mesh structure 90 in the manner previously described.

However, while a plurality of support posts 31 are provided for the railing construction 123 in the manner previously described, another support post 124 of this invention can be utilized in combination with the support posts 31 whereby the support post 124 is adapted to abut against a vertical wall 128 of the supporting structure A to provide an end for the railing construction 123.

As illustrated in FIGURE 28, the support post 124 can be extruded in a well known manner by a suitable extruding apparatus 126 whereby the resulting support post 124 is substantially U-shaped defined by a cross member 127 integrally joined to a pair of transversely disposed legs 128 each having inwardly turned ends 129 provided with interlocking grooves or recesses 130 in a manner similar to the ends 85 of the support posts 31 previously described.

The support post 124 of this invention is adapted to be cut to the desired length and be secured to the vertical wall 125 of the supporting structure A in any suitable manner. For example, the cross member 127 thereof can be directly fastened to the vertical structure 125 by suitable fastening means whereby the legs 128 of the support post 124 define a channel 131 therebetween for a purpose hereinafter described.

When the prefabricated panel means 35 has been provided in the manner previously described, the upper frame member 32 thereof can have a pair of pin means 132 passing through the legs 51 thereof at the notches 61 so as to project beyond the legs 51 at the opposed ends of the upper frame member 32 a distance to permit the pin means 132 to be telescopically disposed inwardly into the facing channels 131 and 86 of the support posts 124 and 31 while being of a length to prevent the pin means 132 from being withdrawn horizontally from the channels 131 and 86 by the opposed ends 129 and 85 of the support means 124 and 31.

In this manner, the pin means 132 carried by the upper frame member 32 will interlock the upper frame member 32 to the support post means 124 and 31.

In addition, the lower frame member 33 carries a pair of pin means 133 at the opposed sides thereof with the pin means 133 passing through the legs 67 thereof a distance to permit the pin means 133 to be vertically telescopically disposed in the channels 131 and 86 of the support post means 124 and 31 while preventing the pin means 133 from being withdrawn horizontally from the channels 131 and 86 by means of the turned ends 129 and 85 of the support post means 124 and 31.

In this manner, the preassembled panel means 35 together with the pin means 132 and 133 can be vertically telescoped downwardly between the support post means 124 and 31 in such a manner that the opposed ends of the upper and lower framing members 32 and 33 will be telescopically disposed in the channels 131 and 86 of the support means 124 and 31 and be horizontally interleaved thereto by means of the pin means 132 and 133 in the manner previously described, the panel means being suspended between the support post means 124 and 31 by having the upper webs 50 of the upper frame member 32 resting on the tops of the support post means 124 and 31 in the manner previously described.

Depending upon the requirements of a particular installation, either the weight of the preassembled panel means 35 alone or this weight plus the friction developed between the snap cover means 36 and the support post means 124 will be sufficient to hold panel means 35 to the support post means 124 and 31.

However, if it is desired to further fasten the panel means 35 into assembled relation with the support post means 124 and 31, the pin means 107 of FIGURE 7 can be utilized in the manner illustrated in FIGURE 23 to directly secure the panel means 35 to the support post means 124 and 31 in the manner previously described.

Thereafter, the hand rail 37 is utilized to complete the railing construction 123 in the manner previously described for the railing construction 30.

If desired, the unobstructed outwardly facing channel 131 of the support post means 124 can be subsequently closed by a mating cover means 36 in the manner illus-
trated in FIGURE 29 in the manner previously described for closing the channels 86 of the support posts 31. Therefore, it can be seen that the lower frame members 23 of the railing construction 123 can be interconnected to the support post means 124 and 31 by the pin means 133 rather than by the structure illustrated in FIGURE 9 of the railing construction 30.

Another railing construction of this invention is generally indicated by the reference numeral 134 in FIGURES 30–34 and parts thereof similar to the railing constructions 30 and 123 previously described are indicated by like reference numerals.

In particular, the railing construction 134 includes the support means A carrying the support post means 124 and 31 for supporting panel means 135 of this invention, each panel means 135 including upper and lower frame members 32 and 33 interconnected to the support post means 124 and 31 in the same manner as the railing construction 123 of FIGURE 20 and a pair of upright frame members 34 either interconnected to the upper and lower frame members 32 and 33 in the manner previously described or in the manner illustrated in FIGURES 31 and 33 later to be described. The frame members 32, 33 and 34 carry a panel 136 in manner hereinafter described and hand rail means 37 and cover means 36 complete the railing construction 134 in the manner previously described.

Since the panel member 136 of the railing construction 134 is substantially rigid, the upright frame members 34 can be interconnected to the upper and lower frame members 32 and 33 by an elongated J-bolt 137 having a threaded end 138 passing through a suitable aperture 139 in the transverse web 50 of the upper frame member 32 and having a hook end 140 passing through a suitable aperture 141 in the transverse web 68 of the lower frame member 33 in the manner previously described and nut 142 on the end 138 of the J-bolt 137, the opposed ends of the particular upright frame member 34 are compacted against the webs 50 and 68 of the upper and lower frame members 32 and 33, the J-bolt 137 being disposed against the transverse web 68 of the upright frame member 34. Thereafter, cover members 36 can be utilized to close off the outwardly directed channels 69 of the upright frame members 34 in the manner illustrated in FIGURE 32.

In order to interconnect the substantially rigid panel member 136 to the frame members 32, 33 and 34, a suitable retainer 143 is provided, the retainer 143 for the upright frame members 34 having the properties to be inserted in the channels 69 thereof while the retainers 143 for the frame members 32 and 33 having the correct size for insertion in the channel 69 thereof.

In particular, the retainer 143 can be extruded by a conventional extruding apparatus 144 in the manner illustrated in FIGURE 34 so that the extrusion 143 can be subsequently cut to the desired length.

The retainer 143 is substantially U-shaped defined by a cross member 144 integrally connected to a pair of spaced parallel legs 145 each terminating in a reversely turned flat end 146. Each end 146 has an angularly disposed leg 147 each member being inverted therefrom and provided with a projection 148 adapted to be snapped in a channel 69 of the upright and lower frame members 33 and 34 or the channel 69 of the upper frame member 32 in the manner illustrated in FIGURES 31 and 32 while the legs 146 are effectively close off the channels 69 thereof.

In this manner, it can be seen that the retainers 143 can be snapped in the channels 69 of the frame members 32, 33 and 34 whereby each retainer 143 defines an outwardly facing channel 149 adapted to receive a peripheral edge of the substantially rigid panel member 136 in the manner illustrated in FIGURES 31 and 32 so that the preassembled panel means 135 can be provided to be subsequently assembled with the support post means 124 and 31 in the manner previously described.

Therefore, it can be seen that by utilizing the retainer 143 of this invention the frame members 32, 33 and 34 can be utilized to carry other panel means 136 rather than the mesh structure 90 previously described.

Another railing construction of this invention is generally indicated by the reference numeral 150 in FIGURES 35–37 and parts thereof similar to the railing constructions 30, 123 and 134 are indicated by like reference numerals.

As illustrated in FIGURE 35, the railing construction 150 includes the support post means 124 and 31 carried by the supporting structure A and a plurality of panel means 151 of this invention interconnected to the support post means 124 and 31 in the same manner as provided by railing construction 123.

In particular, each panel means 151 includes an upper and lower frame members 32 and 33 and a plurality of upright frame members 152 arranged in a picket fashion in a manner now to be described.

Each upright frame member 152 has a substantially hollow rectangular cross-sectional configuration whereby the same can be interconnected to the upper and lower frame members 32 and 33 by a previously described J-bolt 137 passing through the interior of the particular upright framing member 152 in the manner illustrated in FIGURES 36 and 37.

In this manner, each upright frame member 152 can be effectively interconnected to the transverse webs 50 and 68 of the upper and lower frame members 32 and 33 by the J-bolt 137 so that the upright frame members 152 provide a preassembled panel means 151 having a picket effect to be interconnected to the support post means 124 and 31 in the same manner as the panel means 35 of FIGURE 20 and previously described.

Thereafter, the unobstructed portions of the channels 69 in the upper and lower framing members 32 and 33 can be filled with the higher 153 or the hand rail means 37 can complete the railing construction 150.

Another railing construction of this invention is generally indicated by the reference numeral 153 in FIGURES 38–40 and parts thereof similar to the previously described railing constructions 30, 123, 134 and 150 are indicated by like reference numerals.

In particular, the railing construction 153 as illustrated in FIGURE 38 includes the support post means 124 and 31 interconnected to the supporting structure A and carrying a panel means 154 of this invention therebetween, the panel means 154 including upper and lower frame members 32 and 33 having the opposed ends thereof received in the inwardly facing channels 69 of the upper and lower frame members 32 and 33.

In particular, it can be seen that each panel section 155 includes tubular sides 156 interconnected together by vertically corrugated intermediate portions 157.

In this manner, the sections 155 can be arranged in a preassembled relationship with the frame members 32, 33 and 152 so that the preassembled panel means 154 can be interconnected to the support post means 124 and 41 in the manner previously described.

If desired, certain of the tubular ends 156 of the sections 155 can be interconnected to the frame members 32 and 33 by the previously described J-bolts 137 passing therethrough. Further, additional upright frame members 152 can be utilized intermediate the outer end upright frame members 152, if desired, with those intermediate upright frame members 152 being interconnected to the upper and lower fame members 32 and 33 by the previously described J-bolts 137.
In view of the above, it can be seen that many different types of railing constructions can be formed according to the teachings of this invention to readily permit preassembled panel means to be effectively and simply interconnected to support post means without requiring field cutting to compensate for misalignment between the support posts and the preassembled panel means.

While the form of the invention now preferred has been disclosed as required by the statutes, other forms may be used, all coming within the scope of the claims which follow.

What is claimed is:

1. In a railing construction or the like, a pair of spaced support posts each having an inwardly facing channel, said support posts each having an upper end, and a panel construction secured to said support posts, said panel construction having an upper frame member provided with opposed ends telescopically received in said channels of said support posts, said upper frame member having a transverse web resting directly on the tops of said upper ends of said support posts to suspend said panel construction between said support posts.

2. In a railing construction as set forth in claim 1, said panel construction having a lower frame member provided with opposed ends telescopically received in said channels of said support posts.

3. In a railing construction as set forth in claim 2, said panel construction having a pair of upright frame members respectively secured to said upper and lower frame members and disposed inboard of said support posts.

4. In a railing construction or the like as set forth in claim 1, said upper frame member carrying pin means interlocked in said facing channels of said support posts.

5. In a railing construction or the like, a pair of spaced support posts each having an inwardly facing channel, said panel construction secured to said support posts, said panel construction having an upper frame member provided with opposed ends telescopically received in said channels of said support posts, said upper frame member having a transverse web resting on said support posts to suspend said panel construction between said support posts, each support post having two flanges, said upper frame member having two flanges disposed outwardly of said facing channels, each flange having the ends thereof turned toward the free ends of the other flange.

6. In a railing construction as set forth in claim 5, fastening means fastening said flanges of said upper frame member and said flanges of said support posts together.

7. In a railing construction as set forth in claim 5, said upper frame member having two legs depending from said transverse web inboard of said flanges thereof to define two downwardly facing channels respectively receiving said flanges of said support posts.

8. In a railing construction or the like, a pair of spaced support posts each having an inwardly facing channel, and a panel construction secured to said support posts, said panel construction having an upper frame member provided with opposed ends telescopically received in said channels of said support posts, said upper frame member having a transverse web resting on said support posts to suspend said panel construction between said support posts, each support post having two flanges, said upper frame member having two flanges disposed outwardly of and overlapping said flanges of said support posts, said upper frame member having two legs depending from said transverse web inboard of said flanges thereof to define two downwardly facing channels respectively receiving said flanges of said support posts, said legs carrying pin means interlocked in said facing channels of said support posts by being disposed behind inwardly turned ends of said flanges of said support posts.

9. In a railing construction or the like, a pair of spaced support posts each having an inwardly facing channel, and a panel construction secured to said support posts, said panel construction having an upper frame member provided with opposed ends telescopically received in said channels of said support posts, said upper frame member having a transverse web resting on said support posts to suspend said panel construction between said support posts, each support post having two flanges, said upper frame member having two flanges disposed outwardly of and overlapping said flanges of said support posts, said panel construction including a lower frame member having opposed ends telescopically disposed in said facing channels of said support posts and carrying pin means interlocked in said facing channels by being disposed behind inwardly turned ends of said flanges of said support posts.

10. In a railing construction or the like as set forth in claim 1, each post having a substantially H-shaped cross-sectional configuration defined by a cross member joined to the medial portions of a pair of spaced parallel flanges to define opposed outwardly facing channels, said upper flange member having said transverse web thereof resting on said flanges of said support posts to suspend said panel construction between said support posts.

11. In a railing construction or the like as set forth in claim 1, each support post having an H-shaped cross-sectional configuration defined by a cross member interconnected to the medial portions of a pair of spaced parallel flanges, each flange having the free ends thereof turned toward the free ends of the other flange.

12. In a railing construction as set forth in claim 11, a capping member being snap-fitted to adjacent ends of said flanges to close off the cavity defined between those ends.

13. In a railing construction or the like, a pair of spaced support posts each having an inwardly facing channel, and a panel construction secured to said support posts, said panel construction having an upper frame member provided with opposed ends telescopically received in said channels of said support posts, said upper frame member having a transverse web resting on said support posts to suspend said panel construction between said support posts, each support post having two flanges, said upper frame member having two flanges disposed outwardly of and overlapping said flanges of said support posts, said panel construction including a lower frame member cooperatively with said legs to define two downwardly facing channels.

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DAVID J. WILLIAMOWSKY, Primary Examiner.
DENNIS L. TAYLOR, Examiner.