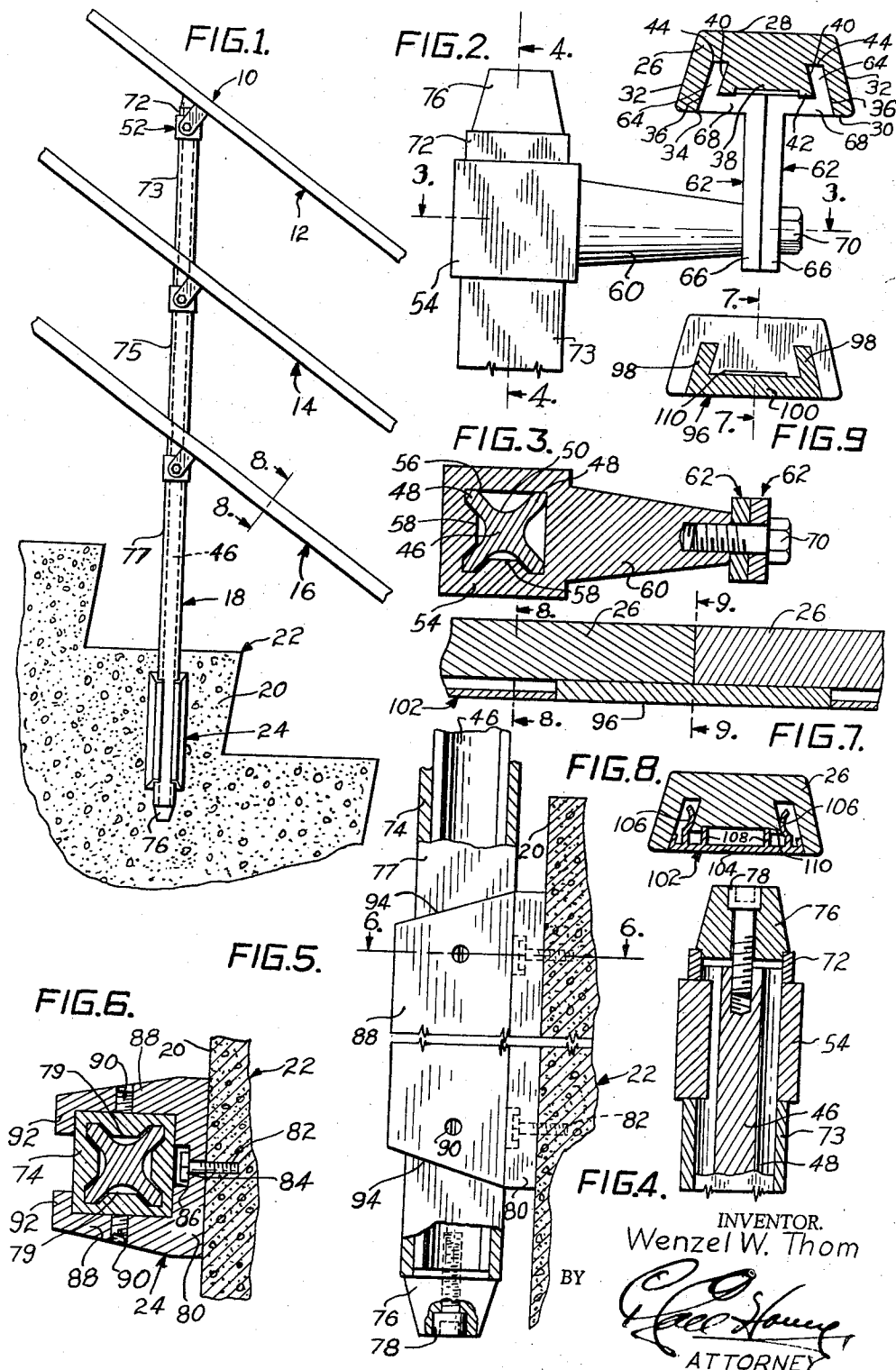


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RAILING ASSEMBLY
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RAILING ASSEMBLY

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This invention relates to improved railing structure and has for its primary object to provide a railing assembly which may be manufactured at a minimum cost and fabricated in a short period of time, production of the components of the assembly being greatly simplified through utilization of extruded metal parts for the major units of the railing structure and assembly of the various components into a completed railing being simplified by virtue of the unique manner in which the parts are connected, using a minimum of fasteners.

It is a further important object of the invention to provide a railing assembly including a number of upright, horizontally spaced standards adapted for supporting a plurality of parallel, superimposed rails with spacer sleeves slidably disposed on the main standard and engaging corresponding connectors joined to the rails, with the connectors also slidably telescoped over respective standards and maintained in proper vertically spaced relationship by the spacer sleeves, thereby precluding the necessity of providing individual fastening means for securing the rail connectors to corresponding standards.

Also an important object of the invention is to provide railing structure as defined above wherein is included improved stop means at each end of the standard engaging proximal extremities of respective spacer sleeves to thereby preclude reciprocation of the same relative to the standard and thereby obviating the necessity of securing the spacer sleeves to corresponding standards.

A still further important object of the invention is to provide a railing assembly which has a novel bracket for permitting each of the standards to be secured to the vertical face of steps constructed of various materials and with the standards adjustably secured within respective brackets in a manner so that such standards may be shifted to any one of an infinite number of positions, whereby the railing assembly is adapted to be utilized on steps of different riser height without modification of the railing assembly being necessary.

Also an important object of the invention is to provide a connector for securing respective rails to the standards permitting the angularity of such rails relative to the standards to be changed as desired without modification or disassembly of the railing structure being required.

Other important objects of the invention relate to the provision of a novel rail having a longitudinally extending groove of unique configuration therein adapted to receive clamp means securing the rail to the connector mounted on a respective standard without additional fastening means of any kind being necessary; to the provision of a splicer permitting a pair of rails to be joined in end-to-end relationship without the interconnecting means being visible from the normal position in which the railing assembly is viewed; to a filler strip constructed in a manner to close those exposed areas of the rail groove not receiving the connector joining respective rails to the standards; to the provision of improved standard and spacer sleeve construction fabricated in a manner to preclude rotation of the spacer sleeves relative to the standard

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on which the same are disposed; to connectors for securing the rails to the standards having an element slidably disposed on each standard and configured to preclude relative rotation between the connector and the standard, yet permitting the element to be moved to predetermined locations as required without rotation of the standard being necessary; to the provision of a railing assembly having components designed to permit manufacture of the same by extrusion methods to substantially lower the overall cost of the unit; and to other important objects and details of construction of the instant railing assembly which will be described in detail or become clear as the following specification progresses.

In the drawing:

Figure 1 is a fragmentary, side elevational view of a railing assembly embodying the present invention with the vertical supporting structure for the handrails being mounted in its normal position on the side wall of a stairway or the like;

Fig. 2 is a fragmentary, enlarged, end elevational view of the uppermost end of the assembly illustrated in Fig. 1, with the upper rail being shown in vertical cross-section;

Figs. 3 and 4 are cross-sectional views taken substantially on the lines 3—3 and 4—4 respectively of Fig. 2;

Fig. 5 is an enlarged, fragmentary, end view of the mounting bracket for securing the railing standard to a base and having the lowermost end of the standard and its associated parts disposed within the bracket in a vertical position, with certain components of the assembly being broken away and in section to reveal details of construction;

Fig. 6 is a horizontal, cross-sectional view taken on the line 6—6 of Fig. 5 and looking downwardly in the direction of the arrows;

Fig. 7 is an enlarged, fragmentary, longitudinal, sectional view through a pair of rails disposed in end-to-end relationship and having novel splicer means interconnecting the same; and

Figs. 8 and 9 are vertical, cross-sectional views taken on the lines 8—8 and 9—9 respectively of Fig. 7, with Fig. 8 illustrating a filler strip disposed in closing relationship to the groove in the lowermost face of each of the rails.

A railing assembly broadly designated by the numeral 10 is shown in the drawing in its preferred form, three rails 12, 14 and 16 supported by upright structure 18 secured to the vertical face 20 of a stairway 22 by bracket means broadly designated 24 being shown to illustrate the concepts of the invention, although it is to be understood that a number of upright structures 18 are normally provided to support any desired number of rails such as 12, 14 and 16.

Each of the rails 12, 14 and 16 comprises an elongated, extruded metal bar 26 substantially trapezoidal in transverse configuration and thereby having parallel, flat upper and lower surfaces 28 and 30 respectively interconnected by angular side faces 32 converging as upper surface 28 is approached. Each of the bars 26 has a longitudinally extending, centrally disposed groove 34 in the normally lowermost surface 30 thereof and defined in part by inner, longitudinally extending groove faces 36 parallel with proximal side faces 32 of bar 26. A longitudinally extending lug 38 integral with bar 26 within the groove 34 thereof and disposed centrally between opposed groove faces 36, is substantially dovetailed in transverse cross-section and thereby has a pair of angular surfaces 40 parallel with faces 36 as well as a lower surface 42 parallel with surfaces 28 and 30 and spaced inwardly from the latter. The groove 34 in bar 26 is thereby substantially U-shaped in transverse section and including a pair of angularly disposed slot portions 44 converging as

the innermost, longitudinally extending areas thereof are approached.

Structure 18 for supporting rails 12, 14 and 16 in vertically spaced relationship to stairway 22 includes a centrally disposed, elongated standard 46 which is substantially X-shaped in cross-section, as best shown in Fig. 3, whereby standard 46 has a plurality of longitudinally extending, circumferentially spaced, radial ribs 48 defining longitudinal recesses 50 therebetween at substantially 90° angles with respect to each other. Standards 46 may be of any desired length, but it is to be understood that the same should be of standard length to lower the production cost of railing assembly 10, inasmuch as the effective height of each standard 46 may be varied by changing the disposition of the same within bracket means 24 in a manner to be more fully defined hereinafter.

A connector broadly designated 52 is provided for each of the rails 12, 14 and 16 and serves to mount such rails in predetermined positions on standard 46. Each connector 52 includes a substantially rectangular element 54 having a rectangular passage 56 therein of dimensions substantially equal to the transverse width of standard 46, whereby the outer longitudinal margins of ribs 48 engage respective elements 54 within the corners of passage 56 therethrough. A pair of adjacent projections 58 integral with adjacent inner surfaces of each element 54 and extending inwardly into the passage 56 therethrough are adapted to be complementally received within corresponding adjacent recesses 50 in standard 46 defined by respective pairs of opposed ribs 48.

Frusto-conical extension 60 projecting outwardly from and integral with each element 54 is in alignment with projection 58 and is perpendicular to the axis of standard 46 when each connector 52 is mounted on the standard.

A pair of identical, substantially Z-shaped clamps 62 are provided for securing respective rails 12, 14 and 16 to extensions 60 on corresponding elements 54, with each clamp 62 having a relatively short, angularly disposed leg 64 adapted to be received within a corresponding slot portion 44 of groove 34 in bar 26 and joined to a relatively long leg 66 by an intermediate length 68. As best shown in Fig. 2, clamps 62 are adapted to be positioned with the legs 66 thereof in abutting relationship and legs 64 received within corresponding slot portions 44 of bar 26. A stud bolt 70 passing through the lower ends of each leg 66 of clamps 62 and threaded into the outermost extremity of extension 60 rigidly secure respective rails 12, 14 and 16 to connectors 52. It can be recognized that the relative angularity of rails 12, 14 and 16 with respect to standard 46 may be changed by pivoting clamps 62 about the axes of bolts 70 and extension 60.

A number of spacer sleeves 72, 73, 75 and 77 are employed for maintaining connectors 52 and thereby rails 12, 14 and 16 in predetermined relative relationship and also vertically from stairway 22. Each of the sleeves 72, 73, 75 and 77 has four projections 79 integral with respective inner surfaces of the defined sleeves and slidably received within corresponding longitudinal recesses in standard 46. It can be seen that the number of spacer sleeves required will vary with the rails mounted on support 46 but in the railing assembly shown in Fig. 1, wherein three rails designated 12, 14 and 16 are mounted on standard 46, spacer sleeves 72, 73, 75 and 77 serve to maintain rails 12, 14 and 16 in proper spatial relationship on standard 46. Each of the spacer sleeves 72, 73, 75 and 77 comprises a rectangular tube 74 of internal dimensions substantially equal to the external transverse dimensions of standard 46 whereby tubes 74 are in slidable engagement with ribs 48 of standard 46. The longitudinal length of each tube 74 will depend upon the position at which it is desired to support a respective bar 26 but, in the assembly 10 shown in Fig. 1, spacer sleeve 72 is relatively short, spacer sleeves 73 and 75 are of intermediate length, while lower spacer sleeve 77 is of substantially

greater longitudinal dimension to thereby cause rails 12, 14 and 16 to be located in equally spaced relationship and at a proper level above the steps of stairway 22. Inasmuch as opposed adjacent ends of spacer sleeves 72, 73, 75 and 77 butt against elements 54 of connectors 52, it can be seen that reciprocation of connectors 52 on standard 46 is precluded so long as the defined spacer sleeves are prevented from shifting on standard 46. Means for preventing shifting movement of the spacer sleeves preferably comprises a frusto-pyramidal stop 76 coaxial with standard 46 at each end thereof and secured to the same by respective stud bolts 78 threaded into the outer extremities of standard 46. The greatest transverse dimension of stops 76 is disposed adjacent standard 46 and each stop is of sufficient width to overlap a respective peripheral margin of one of the spacer sleeves 72 and 77 to thereby prevent reciprocation of the same on standard 46.

Bracket means 24 for securing structure 18 to face 20 of stairway 22 is preferably substantially U-shaped in transverse cross-section and thereby includes a longitudinally extending bight portion 80 adapted to be secured to face 20 of stairway 22 by a number of bolts 82 extending through bight portion 80 into stairway 22 and having the heads 84 thereof recessed within depressions 86 in the normally innermost face of bight portion 80. Parallel, opposed leg portions 88 integral with bight portion 80 are adapted to embrace corresponding, opposed sides of spacer sleeve 77, while the inwardly turned, spaced, parallel tab portions 92 integral with the longitudinally extending margin of each leg portion 88 engage the normally outermost face of spacer sleeve 77 to thereby retain structure 18 within bracket means 24. Setscrews 90 extending laterally through leg portions 88 engage opposed outer faces of spacer sleeve 77 to maintain structure 18 in predetermined relationship relative to bracket means 24, yet permitting vertical adjustment of structure 18 to any one of an infinite number of positions relative to bracket means 24. Upper and lower edges 94 of bracket means 24 are preferably beveled so that the same converge as tab portions 92 are approached to thereby eliminate to a certain extent, sharp corners on bracket means 24 and also enhancing the appearance of bracket means 24.

In order that a pair of bars 26 may be connected in end-to-end relationship to present one of the rails 12, 14 or 16, a splicer broadly numerated 96 is provided for interconnecting abutting ends of bars 26 without detracting from the overall appearance of the rail assembly. As best illustrated in Fig. 9, splicer 96 comprises an elongated, substantially U-shaped component having a pair of angularly disposed, longitudinally extending segments 98 adapted to be received complementally within corresponding slot portions 44 of bars 26, with segments 98 being integral with and interconnected by a central section 100 configured to be disposed within groove 34 in engagement with surfaces 42 of lugs 38 and flush with normally lowermost surfaces 30 thereof.

A pair of bars 26 are interconnected in end-to-end relationship by first inserting splicer 96 into the groove 34 in one end of a bar 26, whereupon the end of another similar bar is shifted into a position abutting the first bar with splicer 96 also located in the groove 34 thereof.

In order to close the normally open groove 34 in each bar 26 and not occupied by clamps 62, a filler strip 102 may be provided and of a length equal to the distance between connectors 52 joined to the same rails 12, 14 or 16 or between such connector and a splicer 96. Each filler strip may be constructed of an elongated, flat wall 104 of a width substantially equal to that of groove 34 adjacent surface 30 of bar 26 and including integral, inwardly projecting, longitudinally extending, parallel spring clips 106 disposed to engage angular surfaces 40 of lug 38 to thereby releasably maintain filler strip 102 in closing relationship to a respective groove 34. Elongated

gated spacers 108 integral with wall 104, parallel with spring clips 106, are of sufficient width to be received within an elongated channel 110 in surface 42 of each lug 38; spacers 108 maintaining filler strips 102 in flush relationship with respective surfaces 30 of bars 26.

The manner in which the various components of railing assembly 10 are assembled is believed to be obvious from the above description, but it is to be emphasized that an important advantage of the instant railing unit is the fact that the same may be placed in position on stairway 22 in a minimum of time, inasmuch as it is only necessary to slip elements 54 of connectors 52 over standard 46 in conjunction with the proper spacer sleeves 72, 73, 75 and 77, followed by securing of stops 76 to respective ends of standard 46 and threading of bolts 70 through legs 66 of clamps 62 and into extensions 60. The relative height of rails 12, 14 and 16 with respect to stairway 22 may be readily adjusted by shifting spacer sleeve 77 within bracket means 24 upon loosening of setscrews 90, while the angularity of rails 12, 14 and 16 with respect to structure 18 may be varied by rotating clamps 62 secured to rails 12, 14 and 16 about the axis of corresponding extensions 60.

Another feature of the invention is the fact that a large proportion of the components of assembly 10 may be manufactured at a minimum cost through conventional extrusion procedures. This is true of bars 26, standard 46, spacer sleeves 72, 73, 75 and 77, spacers 96 and filler strips 102. Furthermore, bracket means 24 may be formed of sheet material suitably bent into configuration if desired.

Another important advantage of railing assembly 10 is the manner in which the relative distance between rails 12, 14 and 16 may be easily changed as desired by merely utilizing spacer sleeves 73 and 75 of different lengths. In this respect it can be appreciated that an elongated tube 74 may be provided with assembly 10 whereupon the contractor may cut such tube into desired lengths to present spacer sleeves for maintaining connectors 52 in predetermined relative relationship.

The utilization of substantially Z-shaped clamps 62 is also of importance because of the manner in which rails 12, 14 and 16 are effectively secured to connectors 52 without any type of additional fastening means in the nature of bolts or the like being required and which would not only detract from the appearance of railing assembly 10 but would also increase the fabrication time thereof.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a railing assembly, an elongated rail provided with a longitudinally extending groove in the normally lower face thereof; an upright standard for supporting the rail and adapted to be secured at the lowermost end thereof to a base; a connector joined to the rail within said groove thereof and including an element slidably disposed on said standard; and sleeve means telescoped over said standard on opposed sides of said element for maintaining the connector and thereby the rail in predetermined vertically spaced relationship relative to said base.

2. A railing assembly as set forth in claim 1 wherein said sleeve means are freely slidable on said standard and wherein is provided stop means secured to the standard on opposed extremities thereof in engagement with proximal sleeve means for preventing reciprocation of the sleeve means and thereby the connector on said standard.

3. A railing assembly as set forth in claim 2 wherein the sleeve means adjacent each extremity of the standard terminate at corresponding outer ends of the standard, said stop means being releasably joined to corresponding outer ends of the standard and engaging respective proximal ends of said sleeve means.

4. A railing assembly as set forth in claim 1 wherein

said connector includes clamp means engageable with the railing within said groove thereof and pivotally connected to said element to permit swinging movement of the rail relative to said element and thereby the standard.

5. A railing assembly as set forth in claim 1 wherein is provided interengageable structure on the element and standard respectively for preventing rotation of the element about the axis of said standard.

6. A railing assembly as set forth in claim 4 wherein said structure includes a projection integral with said element and extending inwardly toward the axis thereof, said standard having a longitudinally extending recess therein substantially complementally receiving said projection.

7. A railing assembly as set forth in claim 6 wherein said standard has a number of longitudinally extending, circumferentially spaced recesses therein adapted to receive said projection on the element.

8. A railing assembly as set forth in claim 6 wherein said standard is substantially X-shaped in transverse cross-section presenting a number of equally circumferentially spaced, longitudinally extending ribs defining recesses at right angles to each other and adapted to receive said projection on the element.

9. A railing assembly as set forth in claim 8 wherein said element is rectangular in cross-section and has a transversely rectangular passage therethrough complementally receiving the standard whereby the ribs of the standard engage the inner passage surfaces of the element.

10. A railing assembly as set forth in claim 8 wherein said sleeve means are each rectangular in cross-section and complementally receive said standard whereby rotation of the sleeve means relative to the standard is precluded.

11. A railing assembly as set forth in claim 1 wherein is provided means for mounting the standard on the base and including a substantially U-shaped, elongated bracket adapted to be secured to the base and receiving the lowermost end of the lower sleeve means and said standard therein in telescoped, substantially surrounding relationship and fastening means releasably connecting said lower sleeve means to said bracket.

12. A railing assembly as set forth in claim 11 wherein said fastening means permits adjustment of the standard and sleeve means thereon relative to the bracket to any one of an infinite number of positions.

13. In a railing assembly, an elongated rail provided with a longitudinally extending groove in the normally lower face thereof; an upright standard for supporting the rail and adapted to be secured at the lowermost end thereof to a base; an element slidably mounted on said standard and provided with an elongated, outwardly projecting extension in substantially perpendicular relationship to the standard; clamp means pivotally mounted on the extension for rotation on the longitudinal axis thereof and including a pair of substantially Z-shaped components having angularly disposed first legs remote from the extension removably and complementally disposed within said groove in the rail in position to releasably secure the latter to said extension and thereby the standard; spacer sleeves telescoped over the standard on opposed sides of the element; and stop means secured to the standard and engaging respective spacer sleeves for preventing reciprocation of the sleeves and thereby the rail relative to the standard.

14. A railing assembly as set forth in claim 13 wherein said rail is provided with an integral, longitudinally extending, transversely dovetailed lug disposed centrally within said groove and presenting angularly positioned, opposed, longitudinally extending slots complementally receiving respective legs of the components.

15. A railing assembly as set forth in claim 14 wherein is provided an elongated, transversely U-shaped splicer having angularly disposed legs converging as the outer

longitudinal margins thereof are approached and complementally received within respective aligned slots of a pair of rails in end-to-end relationship.

16. A railing assembly as set forth in claim 14 wherein is provided filler strip means for closing those portions of the groove in said rail clear of said legs of the components, said strip being provided with an outer flat wall, and spring clip means integral with the normally innermost face of said wall and engaging opposed, angularly disposed faces of the lug for releasably securing said strip to the rail.

17. A railing assembly as set forth in claim 13 wherein said components have elongated second legs disposed in parallel, abutting relationship, there being bolt means extending through and releasably securing the second legs to the extension and thereby said angularly disposed first legs to the rail.

18. In a railing assembly, a plurality of elongated rails

each having a longitudinally extending groove in the normally lower face thereof; at least one upright standard for supporting the rails and adapted to be secured at the lowermost end thereof to a base; a connector for each of the rails respectively and joined to corresponding rails within the grooves thereof and each connector including an element slidably disposed on the standard; spacer sleeves slidably mounted on the standard between adjacent elements and on opposed ends of the standard; and stop means on each of said opposed ends of the standard and engaging respective sleeves for preventing reciprocation of the latter relative to the standard.

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