ABSTRACT

Upper and lower rails are spaced from one another and each comprises at least one major longitudinal surface with openings provided in the major surfaces. At least one upright rail support member interconnects the upper and lower rails and connecting portions of this support member extend at least in part into the openings and are wedgedly connected to the respective rails. Anchoring members for anchoring the thus assembled rail are provided at longitudinally spaced locations of the rails.

16 Claims, 7 Drawing Figures
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RAILING

BACKGROUND OF THE INVENTION

The present invention relates to a railing, specially for use on balconies, staircases and the like.

The present invention has as its objective to provide a railing which is economical, simple in construction and which can be easily assembled at minimum cost.

SUMMARY OF THE INVENTION

Such a railing, according to the present invention, comprises an upper and a lower rail spaced from one another and each comprising at least one major surface extending in direction of elongation of the rails, and openings provided in the major surfaces of the rails spaced longitudinally thereof. Upright rail support means interconnect the upper and lower rails and have connecting portions which extend at least in part into corresponding openings, and socket means are provided at least in the region of the connecting portions. Wedge means are wedged into the socket means for expanding the connecting portions in the openings to thereby firmly connect the support means to the upper and lower rails, while anchoring means for anchoring the railing at a desired location are provided at longitudinally spaced locations of the railing. The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows a perspective view of a railing used for a balcony or the like, according to the present invention;

FIG. 2 shows a railing used for a staircase;

FIG. 3 shows a cross-section taken on the line III—III of FIG. 1;

FIG. 4 shows a cross-section taken along the line IV—IV in FIG. 1;

FIG. 5, partly in cross-section, shows particulars of the embodiment of FIG. 2;

FIG. 6 prospectively shows a connecting member incorporated in the embodiment of FIG. 1; and

FIG. 7 shows a further connecting member incorporated in the embodiment of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings in which like reference numerals identify like parts, the railing shown in FIGS. 1 and 2 is seen to comprise an upper rail 1, a lower rail 2, a plurality of balusters 3 interconnecting the upper rail 1 and the lower rail 2, and anchoring rods 4 positioned at longitudinally spaced locations of the rails 1 and 2. The anchoring rods 4 are spaced relative to one another by a predetermined distance, for example a distance of 1.20 meters. The lower ends 8 of these anchoring rods are anchored in a surface, for example in the surface of a balcony, staircase or the like. Connected to the upper end of each of the anchoring rods 4 is the upper rail 1 by means of a connecting member 7, such as a nail whose stem may be twisted at least in the region of its free end. Preferably such connecting member 7 is provided with a head 8 for retaining purposes. Ribs 9 are provided which taper in direction away from the head 8 and which cut into the strap section 6 of the upper rail 1 as the connecting member 7—e.g., nail—is driven in from above (see FIG. 3). The twist of the stem furnishes an additional retentive force between the rail 1 and the respective anchoring rod 1.

As FIG. 3 shows, the strap section 6 of the rails is of upwardly open —with reference to its position when in use —cross-section, and its upwardly open side is covered with a suitable cap 11 which may, but need not be of synthetic plastic material and is snapped (as shown) or otherwise secured to strap section 6.

It will be appreciated that the rods 4 can be used as thus far described. However, it is also possible and shown in FIG. 3 for them to be incased with jackets 12 and 13. Of these, the jacket 12 surrounds the rod 4 intermediate the upper and lower rails 1 and 2, abutting against both of them, whereas the jacket 13 surrounds the rod 4 intermediate the lower rail 2 and the ground or other support matter in which the bifurcated lower end portion 5 of the rod 4 is embedded. It is advantageous to provide jackets 12 and 13 with inner centering ribs 14 extending axially of the respective jackets; the inner free edges of these ribs 14 may be constructed as cutting edges and the relationship between them and the rods 4 so selected that these edges penetrate the respectively juxtaposed surfaces of the rods 4 as these are introduced into the jackets 12 and 13, the purpose being to guard against looseness of the jackets.

One of the balusters 3, which are located intermediate the rods 4 and also connecting the rails 1 and 2, is shown in FIG. 4. It is preferred that these balusters 3 are profiled members of substantially Z-shaped cross-section (see FIG. 4), the side portions of the profile including with the center portion and with suitable wall portions, the grooves 15 and 16. These extend advantageously over the entire length of the balusters 3 and are open not only at the ends but also at one side as shown. Of course, the grooves 15 and 16 could also be provided only at the opposite upper and lower ends of the balusters 3. Their open side makes the walls bounding them readily deformable so that, when the opposite end portions of the balusters 3 extend into the apertures of the rails 1 and 2 (which apertures correspond to those provided for the rods 4) the nails 17 or analogous connecting members may be driven into the open ends of the grooves 15 and 16, deforming and outwardly expanding the walls bounding the same and providing a tight wedged connection with the surrounding material of the respective rail.

One of the connecting members 17 is shown in FIG. 6, but it is emphasized that it is exemplary only and that others may also find use. The one illustrated in FIG. 6 has a free drive-in end portion 18 which is twisted about the axis of the member 17 through a certain angle, for instance 30°, with reference to the trailing or head end portion. The member 17 is of generally polygonal cross-section and taper and towards the end portion 18. The cross-section and the taper serve to ob-
tain the desired outward deformation of the walls bounding the grooves 15 and 16, and the twist of the end portion 18 superimposes upon this deformation a torsional stress which is transmitted to the material of rails 1 and 2 which bounds the respective openings in which the balusters 3 are anchored.

Coming finally to FIGS. 5 and 7 it will be seen that these are concerned with details of the type of railing construction shown in FIG. 2. Specifically, in FIG. 2 there are rail portions of the upper and lower rails 1 and 2 which extend substantially horizontal, and other rail portions which are connected to them but are inclined to the horizontal, namely those which extend from the upper to the lower of the illustrated steps. Evidently, the degree of inclination will depend upon the rise of the steps.

The horizontal and the inclined rail portions of the upper and lower rails 1, 2 must be connected to afford the necessary stability. According to the invention this is accomplished by using a hinged strap 19 which is shown in detail in FIGS. 5 and 7. It comprises a pin 20 which tiltably connects the strap portions 21 and 22 in the manner of a hinge. The strap portions are each positioned on the upwardly facing surface of the adjacent ends of the strap sections 6 and abut laterally against the side walls of the strap sections underneath the ribs 23 of the strap sections 6 (see FIGS. 3 and 5). Set screws 24 are threaded into the holes provided (see FIG. 7; no reference numeral) in the strap portions 21 and 22 and press with their tips against the strap sections 6, thus urging the strap portions upwardly against the ribs 23 and providing a tight but releasable connection with the strap sections 6, a connection which evidently (see FIG. 5) permits any degree of relative inclination between the strap sections which is likely to be encountered.

In addition to, or in place of the balusters 3 it is also possible to mount plate members between the upper and lower rails, for instance if the railing is for a balcony where privacy is desired which would not be afforded by the spaced-apart balusters 3. Such plates may be of different materials, such as plastic, vitreous material such as glass, wood, “Eternit” which is a tradename for a commercially available composition material, or of other materials.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of construction differing from the types described above.

While the invention has been illustrated and described as embodied in a railing, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims:

1. A railing, comprising elongated upper and lower rails spaced from one another and each comprising at least one major surface extending in direction of elongation of said rails, and openings of predetermined cross-section provided longitudinally spaced in the major surfaces of said rails; upright elongated rail support means interconnecting said upper and lower rails and having connecting portions matingly extending at least in part into said openings and provided with exposed surfaces; socket means in form of longitudinally extending grooves in said exposed surfaces at least in the region of said connecting portions; elongated, helically twisted wedge means of polygonal cross-section configured so as to turn when driven into said grooves and to expand said connecting portions in said openings for maintaining said support means connected to said upper and lower rails in torsional-stress transmitting relationship; and anchoring means for anchoring said railing at a desired location.

2. A railing as defined in claim 1, wherein said wedge means comprise a wedge member having a stem portion and a head portion, and wherein said stem portion is twisted about its longitudinal axis through 30° relative to said head portion.

3. A railing as defined in claim 1, wherein said wedge means comprises wedge members each having a head portion and an elongated stem portion twisted relative to said head portion about its longitudinal axis.

4. A railing as defined in claim 3 wherein said wedge members have a tapering shaft portion intermediate said head portion and said stem portion, said shaft portion having a polygonal cross section.

5. A railing as defined in claim 3, wherein said wedge members are self-tapping screw members are self-tapping screw members.

6. A railing as defined in claim 1, wherein said upright rail support means comprises a plurality of parallel elongated balusters spaced from one another in direction of elongation of said rails, and having upper and lower ends constituting said connecting portions, and wherein said grooves each extend over the entire length of said balusters between said upper and lower ends thereof.

7. A railing as defined in claim 1, wherein each of said elongated balusters comprises an upper and a lower end constituting said connecting portions; and wherein said socket means comprises two of said grooves in the region of each of said ends.

8. A railing as defined in claim 1, said upper and lower rails extending in parallel superposed planes, and said upright support means extending transversely to said planes.

9. A railing as defined in claim 1, said rails having longitudinally spaced ends, and said anchoring means comprising at least two anchoring members provided at said opposite ends and each including an elongated upright support bar having an upper end portion connected to said upper rail, a lower end portion adapted to be embedded at a desired location, and an intermediate portion extending through said lower rail.

10. A railing as defined in claim 9 further comprising connecting members extending through said upper rail and being firmly lodged in said upper end portions of the respective support bars.

11. A railing as defined in claim 10, said connecting members each comprising a wider head portion engag-
ing said upper rail, and a narrower stem portion lodged in the respective upper end portion.

12. A railing as defined in claim 11, said stem portion having an axis and being twisted through substantially 30° about said axis and with reference to said head portion.

13. A railing as defined in claim 9, said support bar being of substantially rectangular cross-section, and said lower end portion thereof being of substantially inverted Y-shaped configuration.

14. A railing as defined in claim 9, said anchoring means further comprising a jacket member enclosing the respective support bar intermediate said upper and lower rails and having upper and lower edges respectively abutting against said upper and lower rails.

15. A railing as defined in claim 14, said anchoring means further comprising an additional jacket member enclosing the respective support bar below said lower rail and having opposite end edges respectively engaging said lower rail and the surface in which the support bar is embedded.

16. A railing as defined in claim 11, said connecting members each comprising ribs provided in the region of the juncture between said head and stem portions and tapering in direction away from the respective head portion.

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