

Sept. 26, 1967

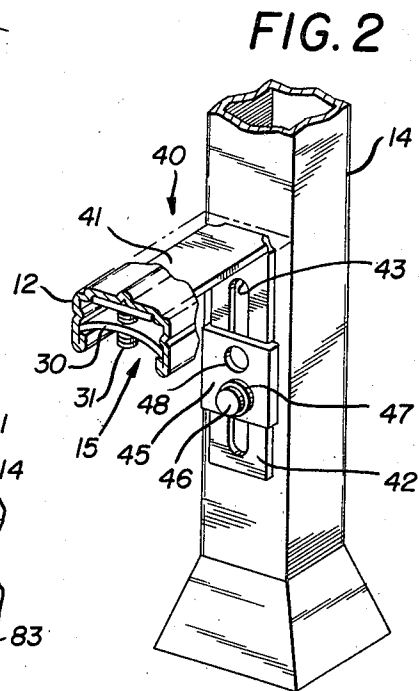
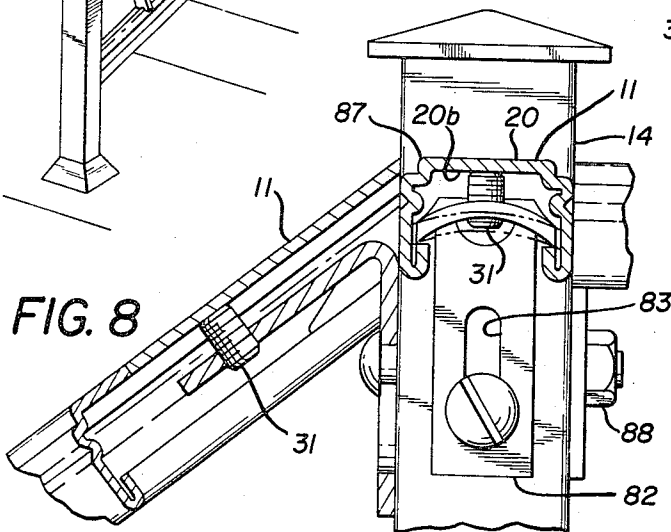
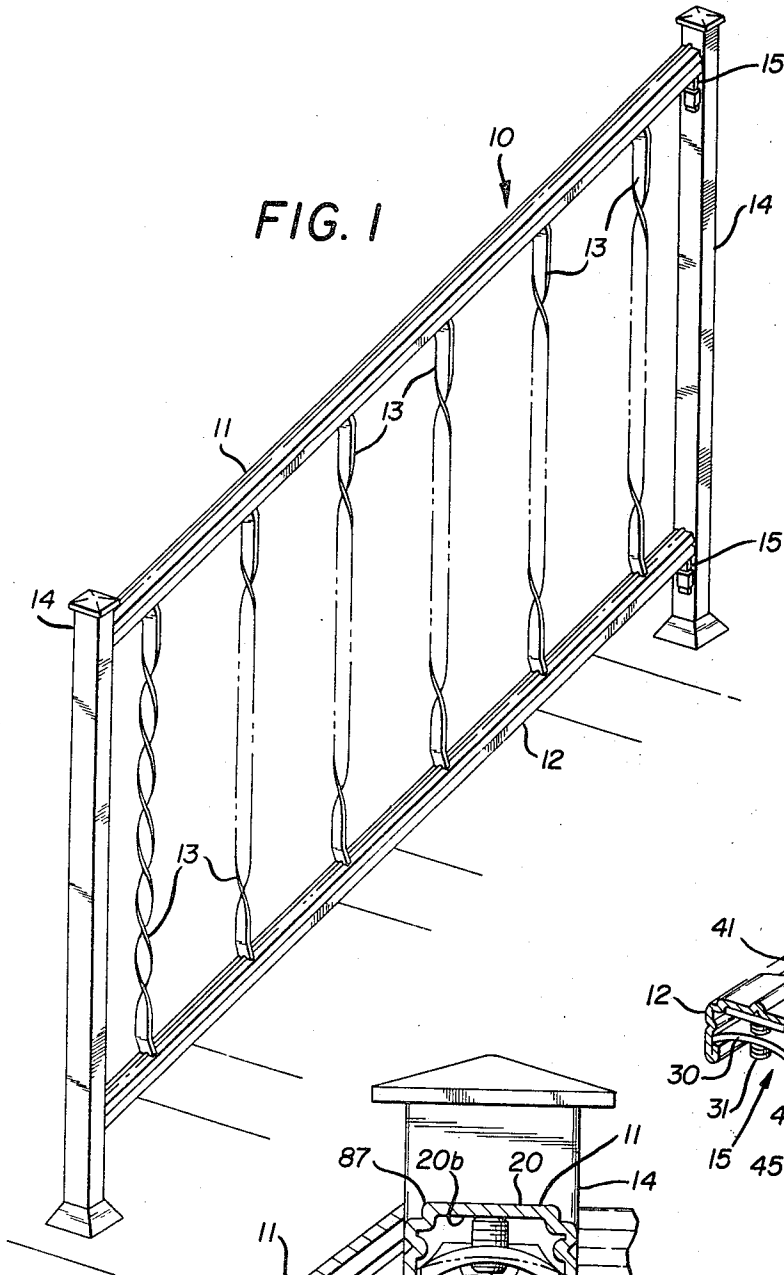
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3,343,811

HEAVY DUTY ADJUSTABLE RAILING

Filed Oct. 11, 1965

3 Sheets-Sheet 1



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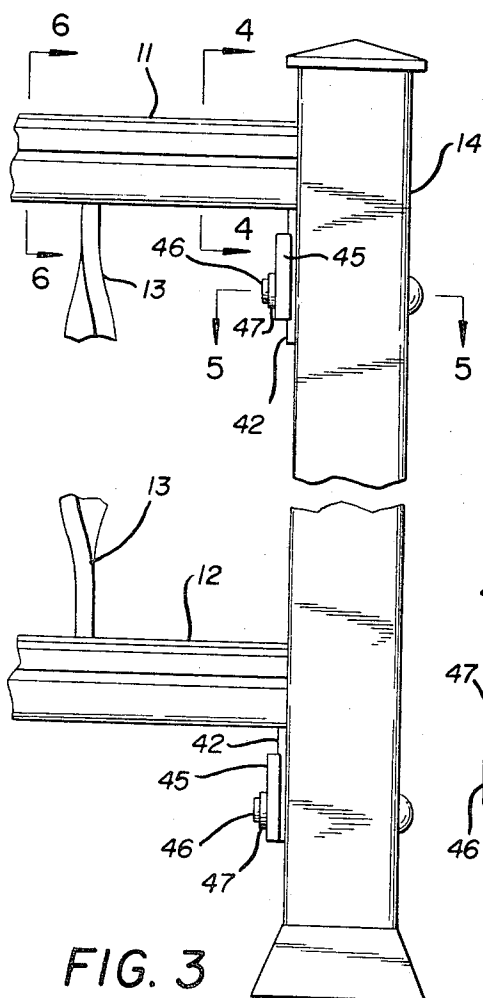


FIG. 3

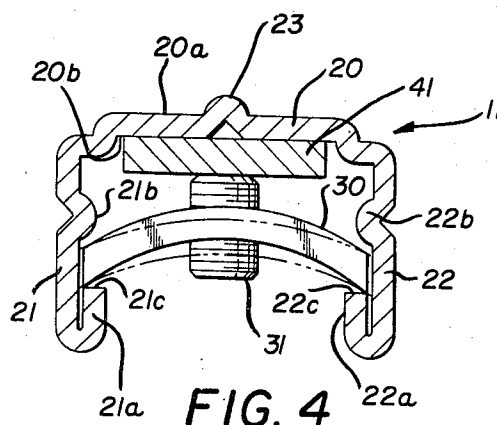


FIG. 4

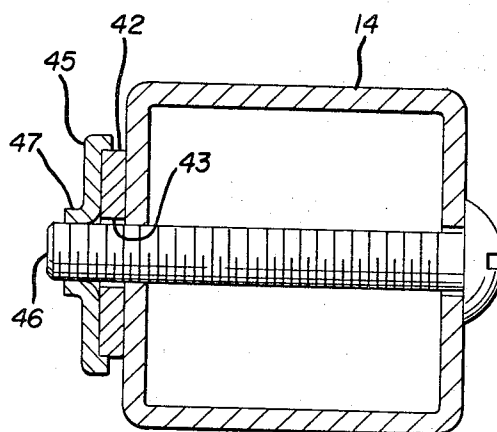


FIG. 5

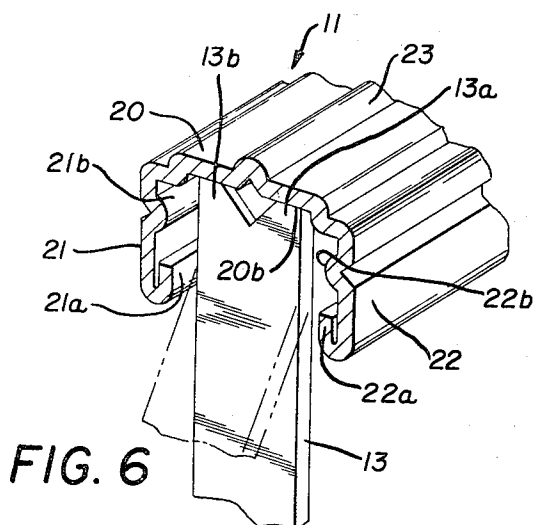


FIG. 6

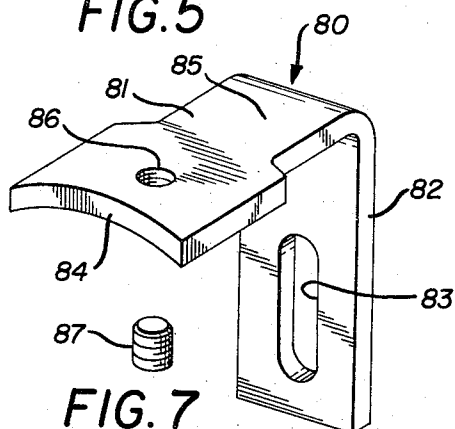


FIG. 7

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FIG. 9

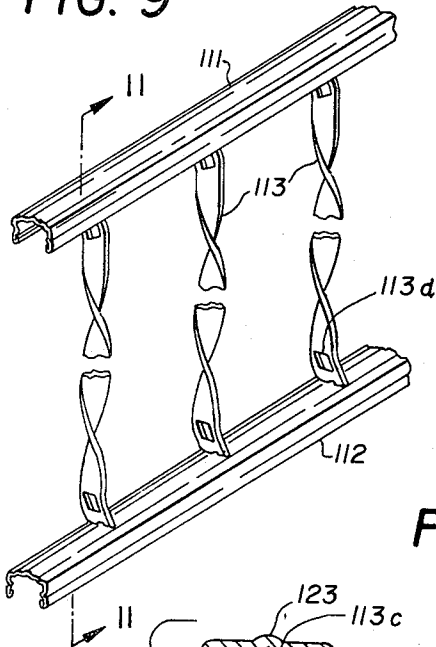


FIG. 10

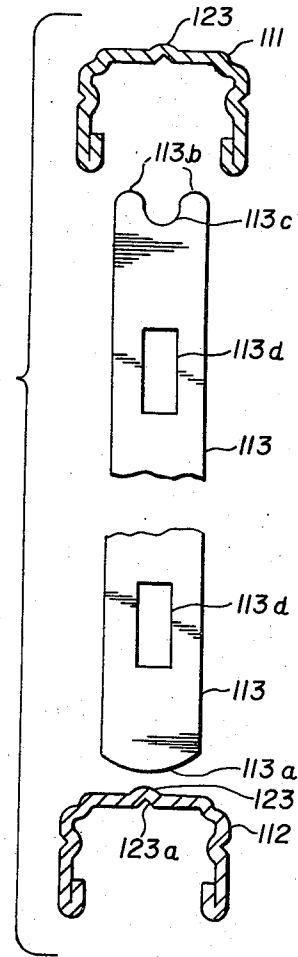
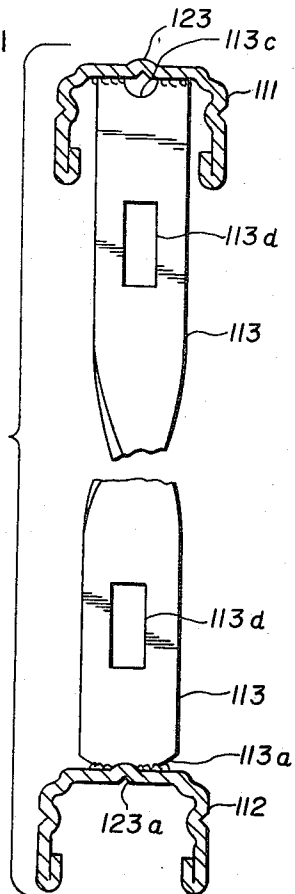


FIG. 11



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HEAVY DUTY ADJUSTABLE RAILING

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5 Claims. (Cl. 256—22)

This application is a continuation-in-part of our application Ser. No. 438,588, filed Mar. 10, 1965, now abandoned.

This invention relates to the art of wrought iron railings and in particular relates to an improved type of ornamental railing that is characterized by its over-all strength while being adjustable to permit installation of the railing by the home owner on a "do-it-yourself" basis on both level and inclined surfaces.

While wrought iron railings of the general type above discussed have long been known the initial introduction of railing sections of this type involved the manufacture of the same to predetermined pitches at the factory in order to fit the needs of each particular purchaser, with the custom made units then being shipped to the home owner for installation.

Subsequent developments in this field produced railing assemblies that could be set to any desired pitch by the home owner at the time of installation thus reducing cost to the ultimate user while permitting great flexibility in the use of the railing assemblies.

A representative railing of the type herein referred to is shown in Kools United States Patent 2,715,513, issued Aug. 16, 1955.

Railing assemblies of this type generally included parallel top and bottom rails interconnected by a plurality of spindles that were locally weakened adjacent their ends to facilitate "pitching." The section thus formed was then normally attached to newel posts at its opposed ends by the use of connector fittings which were bolted to both the newel posts and the top and bottom rails.

While the above improvements display a marked advance in the art certain disadvantages still exist with regard to presently available railings designed for installation by the home owner.

One of the problems presented with respect to the attachment of the assembled railing section to the supporting newel posts and in this regard, the known prior art envisions the use of connector fittings that, as above noted, utilize nuts and bolts to connect the rails with respect to the newel posts. Since the railing sections come from the factory in standard lengths and are cut to size on the job, it is believed apparent that they must also be drilled on the job to accommodate these known nut and bolt type of connectors.

Another form of "do-it-yourself" railing is shown in applicants' prior Patent U.S. 3,005,623, where the spindles in question are assembled "on site" by the use of conventional nuts and bolts with the adaptor bracket being deformable for "pitching" purposes.

While railings of this type are readily assemblable the same do have the inherent disadvantage of lacking rigidity due to the lack of welded connections.

A further disadvantage inherent in the earlier mentioned prior art railings (Kools U.S. 2,715,513) exists with respect to the known methods of locally weakening the spindles inwardly of their ends so as to permit "pitching" of the railing section. This is generally accomplished by providing apertures of varying sizes in the spindle adjacent its end and in this regard, the over-all rigidity of the railing is inversely proportional to the ease with which the same can be "pitched." Stated otherwise, the easier it is to "pitch" the rail section, the weaker the railing section will be. Also since the point of bend-

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ing is spaced inwardly from the end of the spindle it is difficult to maintain parallelism between the spindles and newel posts since the spindles have a tendency to become distorted upon "pitching."

It has been found that the disadvantages above noted with regard to the connectors can be obviated by providing an improved type of connecting means which is secured to the rails by utilizing the configuration of the railing itself to thus obviate the need for drilling the railing while effectively interconnecting the same with the newel post.

Secondly, it has been found that the localized weakening hole normally employed for "pitching" purposes can be eliminated if the ends of the spindles are contoured to provide bifurcated end surfaces that are in turn welded to the railing section. It has been found that use of such a structure minimizes the distortion that would otherwise occur upon "pitching," as for example when localized weakening holes are utilized.

In this regard it has also been found that the use of the bifurcated end above described does not weaken the rigidity of the railing so that the railing section envisioned by the improved disclosure herein contained will be extremely rugged in nature although still capable of being easily "pitched" by the average home owner.

Production of an improved railing unit having the above described advantages accordingly becomes the principal object of this invention with other objects of the invention becoming more apparent upon a reading of the following brief specification considered and interpreted in the light of the accompanying drawings.

Of the drawings:

FIGURE 1 is a perspective view of the improved railing section, partly broken away in section showing the same on an inclined surface.

FIGURE 2 is an enlarged perspective view partly broken away in section and showing the clamping mechanism interconnecting the railing to the newel post.

FIGURE 3 is a side elevation of the improved railing section partly broken away and in section.

FIGURES 4 and 5 are vertical and horizontal sections respectively taken on the lines 4—4 and 5—5 of FIGURE 3.

FIGURE 6 is a perspective sectional view taken substantially along the lines 6—6 of FIGURE 3.

FIGURE 7 is a perspective view of a modified form of connecting member.

FIGURE 8 is a fragmentary sectional view showing utilization of the modified connecting member for connecting the spindle and rail portions together.

FIGURE 9 is a perspective view of a modified form of the improved railing section partially broken away and in section showing the same on an inclined surface.

FIGURE 10 is an end elevation of the modified form of the invention shown in FIGURE 9 partially broken away and showing the top and bottom rails and spindle in unassembled condition.

FIGURE 11 is a sectional view taken on the lines 11—11 of FIGURE 9 and showing the top and bottom rails and the spindle in assembled condition.

Referring now to the drawings and in particular to FIGURE 1, the improved railing assembly, generally designated by the numeral 10, includes identical top and bottom rail sections 11 and 12 that are interconnected by a plurality of parallel spindles 13, 13 with the ends of the same being fixedly secured to the railing sections 11 and 12, and with the entire just described assembly being connected to newel posts 14, 14 by clamping means 15, 15 as clearly indicated in FIGURES 1 and 2 of the drawings.

Referring next to FIGURES 4 and 6 for a more detailed description of rail sections 11 and 12, it will be noted

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that said railing sections, which have been indicated as being identical in cross sectional contour, are generally of U-shaped configuration in cross section so as to include a base portion 20 and opposed leg portions 21 and 22 that depend from the top portion 20. The base portion 20 has an outer surface 20a and an interior surface 20b with an elongate raised alignment notch 23 being centrally located on top portion 20 as clearly shown in FIGURES 4 and 6 of the drawings.

For the purpose of coaxing with clamping means 15, 15 projecting ends 21a and 22a of the leg portions 21 and 22 are shown bent upwardly upon themselves to define continuous shoulders 21c, 22c. Additionally, a clip unit 30 is shown slidably received between legs 21 and 22 and may be seated on shoulders 21c, 22c with opposed side indentations 21b and 22b of legs 21 and 22 serving to limit upward movement of the clip 30 as is clearly apparent from FIGURES 2 and 4.

With reference to clip 30 the same is shown as being of generally rectangular configuration in plan while being slightly arched in cross sectional configuration for the purpose of permitting flexing and transverse expansion upon operation of set screw 31 that is carried in an appropriately tapped aperture provided centrally of clip 30.

In this regard, the set screw 31 bears against the bottom of leg member 41 of connector 40 and in FIGURE 4 the clip 30 is shown moving from its unflexed, full line condition, to the flexed condition shown in dotted lines upon tightening of set screw 30, with it being apparent that such movement serves to bind the opposed edges of the clip 30 against the interior side walls of the leg portions 21 and 22.

Referring now to FIGURE 2 for a detailed description of the connector element that has been generally designated by the numeral 40 it will be seen that the same includes a right angle plate member having divergent leg portions 41 and 42 with leg portion 42 having a central elongate slot 43 as clearly shown in FIGURE 2 of the drawings.

For the purpose of securing the leg 42 of connector 40 with respect to the newel post 14, a U-shaped clip 45 is provided for clamping over the leg portion 42 with the clip having a threaded aperture 47 therein that is positioned so that it will be in registry with slot 43 when the clip 45 is clamped over the leg portion 42. In this fashion the projecting end of a bolt 46 may be threaded into aperture 47 after passing through slot 43 and the aperture (not shown) in the newel post itself.

A further bore 48 is provided in the clip 45 as shown in FIGURE 2 to receive the shank or free end portion of a second bolt which might be attached to a connector unit 40 in place on the opposite face of the newel post 14. This will occur in railings of extended lengths wherein a series of newel posts are required.

The remaining leg 41 of the connector 40 is of such a width that the same may be received within the rail 11 or 12 as shown in FIGURES 2 and 4. Upon insertion as just described, the top surface of the leg 41 will abut the interior surface of the rail 20b and will in turn have its lower surface resting on set screw 31 for clamping purposes as will be described below.

Turning now to FIGURE 6 it will be noted that each end of spindle 13 is bifurcated so as to define leg portions 13a and 13b with these legs being welded to either the inner face 20b of the upper rail 11 or the outer face 20a of the lower rail 12. In this regard it will be noted that the notch defined by the leg portions 13a and 13b will straddle the elongate alignment notch 23 of top rail 11, although it is to be understood that flat type rails can be used in place of the contoured rails shown in the drawings.

The bifurcated construction of the ends of spindles 13, 13 also has an advantage with regard to attaching the spindles to the rails by welding. Thus normal projection welding will cause a bump to appear on the surface of the railing opposite the welding point. It has been found that

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by bifurcating the ends of the spindles that when the bifurcated ends are welded to the rail that the aforementioned bump will not occur.

In use or operation of the improved railing section a length of railing section will be provided and will include the upper rail 11, the lower rail 12, and the connecting spindles 13 welded in place therebetween. When the newel posts 14, 14 have been positioned in parallel spaced relationship as shown, for example, in FIGURE 1, it is merely necessary that the rails 11 and 12 be cut to the required length so as to span the distance between adjacent posts 14, 14.

Following this the clip 30 may be inserted interiorly of the rail adjacent its open end following which the leg portion 41 of connector 40 may be inserted between clip 30 and the interior surface 20b of the rail with this position of component parts being clearly shown in FIGURES 2 and 4 of the drawings.

When this has been accomplished, the leg portion 42 of connector 40 can be attached to the newel post by placing clip 45 over the leg 42 of the connector and inserting bolt 46 through the threaded aperture 47 of the clip, with it being noted that the bolt 46 will have passed through slot 43 of the connector prior to threaded reception in aperture 47.

At this time set screw 31 may be tightened to firmly lock the leg portion 41 in place and following this tightening of the bolt 46 may be effectuated to rigidly connect the leg portion 42 with respect to post 14.

This connector will accomplish preliminary securing of the connector element 40 to the newel post.

In the event the railing section in question is to be "pitched" so as to be placed on an uneven surface it follows that "pitching" may be effectuated prior to attachment of the clips as just described. In this regard, the ends of spindles 13, 13 may be readily bent without substantial weakening by virtue of their bifurcation which facilitates bending of the spindles at that point. Also and since the point of bending is close to the ends, minimal distortion of the spindles occurs and maximum parallelism between the spindles and newel posts is achieved.

Similarly, it is believed apparent that disassembly of the unit may be effectuated by the reversal of the above mentioned procedure.

It will be seen from the foregoing how there has been provided a new and improved type of ornamental railing characterized by the presence of connecting means that eliminate the necessity for drilling of the contoured rail section.

It has been shown how this improved form of connecting means is achieved by the use of expanding connecting means that may be expanded for binding engagement with the rail section so as to preclude the necessity for drilling of the same.

It has been also shown how assembly and disassembly of the unit may be accomplished in a matter of seconds and further how the rail may be "pitched" without substantial weakening of the spindles due to the novel and improved type of weakening means and welding connection effectuated between spindle and rail.

Referring now to FIGURE 7, there is illustrated a modified form of connector plate, generally designated by the numeral 80, with this connector plate 80 being contoured to eliminate the need for use of the earlier described clips 30 and 45. Again referring to FIGURE 7, it will be noted that the connector 80 is of generally right angle configuration so as to include a leg portion 81 and a leg portion 82, with leg portion 82 corresponding substantially in contour to the previously described leg portion 42, and with slot 83 again being provided for connection purposes.

With reference to the leg portion 81, it will be noted that the outer end thereof is contoured so as to form a clamping end 84 of arched cross section and of substantially greater width than the remaining portion 85. A

tapped aperture 86 is provided for reception of a set screw 87.

The operation of the modified form of the invention shown in FIGURES 7 and 8 is best understood from the fragmentary section of FIGURE 8, wherein it will be noted that the inboard end of the screw 87 will bear directly against underside 20b of the top rail 20 to thus cause flexing to the chain-dotted line position shown in FIGURE 8. Further, and with reference to the connection of plate 82, it is merely necessary that the bolt be inserted through slot 83 and then passed through appropriate openings in opposed faces of the newel post to facilitate connection with a nut 88, as shown in FIGURE 8. It is to be understood that clip 45 could be employed at this point if desired.

It will be seen from the foregoing that the advantages of having a self-clamping bracket have been retained, while minimizing the number of component parts required.

Turning next to FIGURES 9 through 11, it will be noted that a modified form of the spindle is shown that gives improved welding and aesthetic properties.

Considering FIGURE 10 in particular, it will be noted that the spindle 113 has a rounded bottom end 113a while the top end of the spindle has a pair of rounded projections 113b, 113b connected by a U-shaped connecting portion 113c. Additionally, the spindle is locally weakened adjacent the top and bottom ends by providing cut out portions 113d, 113d.

In the form of the invention shown in FIGURES 9 through 11, the top and bottom rails 111, 112, as well as all other components, except the spindles, are identical to those shown in FIGURES 1 through 8.

In assembly then, projections 113d, 113d on the top end of the spindle 113 are welded to the underside of the top rail 111 as shown in FIGURE 11. The bottom rounded end 113a is placed on the raised notch 123 of the bottom rail 112 and then welded thereto. Use of the rounded end thus provides a larger area that is fused to the bottom rail for even more secure attachment than in the form of the invention shown in FIGURES 1 through 8. Although this welding process results in partially melting raised notch 123 and substantially closing the V-shaped notch 123a on the inside of the bottom rail 112, as seen in FIGURE 11, no aesthetic problem is presented since the effects of the weld are out of sight when the railing assembly is in use.

Similarly, while projections 113b, 113b on the top end of the spindle also tend to burn down during the welding operation, due to their length and configuration the effect of such burning is not apparent on the top surface of top rail 111.

Once the modified spindle 113 has been welded to the top and bottom rails 111, 112 as described above and shown in FIGURE 11, the railing section can be "pitched" as shown in FIGURE 9 in a manner similar to that utilized with the form of the invention shown in FIGURES 1 through 8. In this regard the weakening holes 113d, 113d facilitate the "pitching" operation and the spindle will bend adjacent these weakening points.

Thus, in the modified form of the invention improved attachment between the spindles and the rails is obtained while the aesthetic qualities of the railing are unimpaired.

While a full and complete description of the invention has been set forth in accordance with the dictates of the Patent Statutes it is to be understood that this invention is not intended to be limited to the specific embodiments shown. Accordingly, modifications of the invention may be resorted to without departing from the spirit hereof or the scope of the appended claims.

This application is a continuation-in-part of applicants' copending application, Ser. No. 438,588, filed Mar. 10, 1965.

What is claimed is:

1. A railing assembly adapted to be secured with respect to a fixed surface, comprising;

- (1) an elongate railing section of generally U-shaped cross section and having a base portion and opposed leg portions;
- (2) connecting means including a clamping plate of arched cross sectional configuration that is adapted to be inserted between said leg portions at one end of said railing section;
- (3) opposed support means carried by the internal surfaces of said leg portions and adapted to suspend said clamping plate in predetermined spaced relationship to the interior wall surface of said base portion of said railing section;
- (4) expanding means reacting between said railing section and said clamping plate and flattening said clamping plate to transversely expand the same, with the opposed edge portions thereof being moved apart and into frictional contact with the internal surfaces of said opposed leg portions;
- (5) and fastening means integrally projecting from said clamping plate and having a mounting surface that is disposed at right angles to the plane of said clamping plate.

2. A railing assembly adapted to be secured with respect to a fixed surface, comprising;

- (1) an elongate railing section of generally U-shaped cross section and having a base portion and opposed leg portions;
- (2) an L-shaped connector having one leg provided with an arched end portion that includes a tapped aperture communicating the opposed faces thereof;
- (3) support means adapted to suspend said plate in predetermined spaced relationship to the interior wall surfaces of said railing section;
- (4) a bolt threadably received in said aperture and adapted to bear against the interior surface of said base portion, whereby said arched portion will be flattened and the edge portion thereof will be transversely expanded into frictional contact with the opposed leg portions of said railing section;
- (5) and fastening means adapted to secure the remaining leg portion of said connector with respect to said fixed surface.

3. A railing assembly adapted to be secured with respect to a plurality of fixed surfaces, comprising;

- (1) top and bottom rail sections of generally U-shaped cross section and each having a base portion and opposed leg portions;
- (2) a plurality of identical spindles having their ends connected to said top and bottom rails and being disposed in parallel with each other;
- (3) connecting means associated with each end of each top and bottom rail with each connecting means including a clamping plate of arched cross sectional configuration that is adapted to be inserted between said leg portions at one end of said railing section;
- (4) support means adapted to suspend said plate in predetermined spaced relationship to the interior wall surfaces of said railing section;
- (5) expanding means reacting between said railing section and said clamping plate and flattening said clamping plate to transversely expand the same, with the opposed edge portions thereof being moved apart and into frictional contact with the internal surfaces of said opposed leg portions;
- (6) and fastening means adapted to secure said connecting means with respect to said fixed surfaces.

4. The railing assembly of claim 3 further characterized by the fact that each said top and bottom rail has a central raised rib portion provided in the base portion thereof; said spindles having their respective ends engaged with the underside of said base portion of said top rail and the upper side of said base portion of said bottom rail.

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5. The device of claim 4 further characterized by the fact that said spindles have flared opposed ends that are disposed in parallel, one said spindle end being concave while the other spindle end is provided with a central convex opening; said concave end portion engaging said lower rail section while said convex end portion engages said upper rail section.

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