April 23, 1968 W. THURNAUER 3,379,414

HANDRAIL ASSEMBLY

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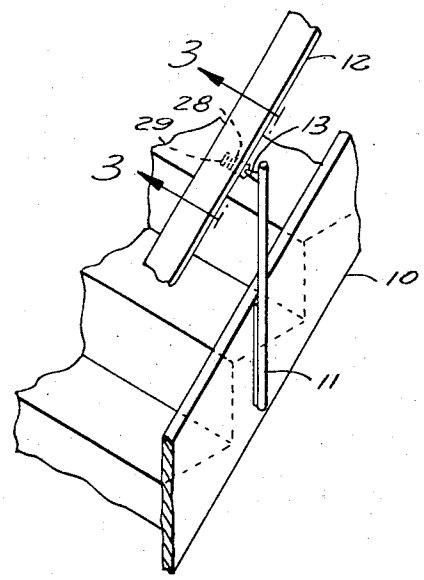
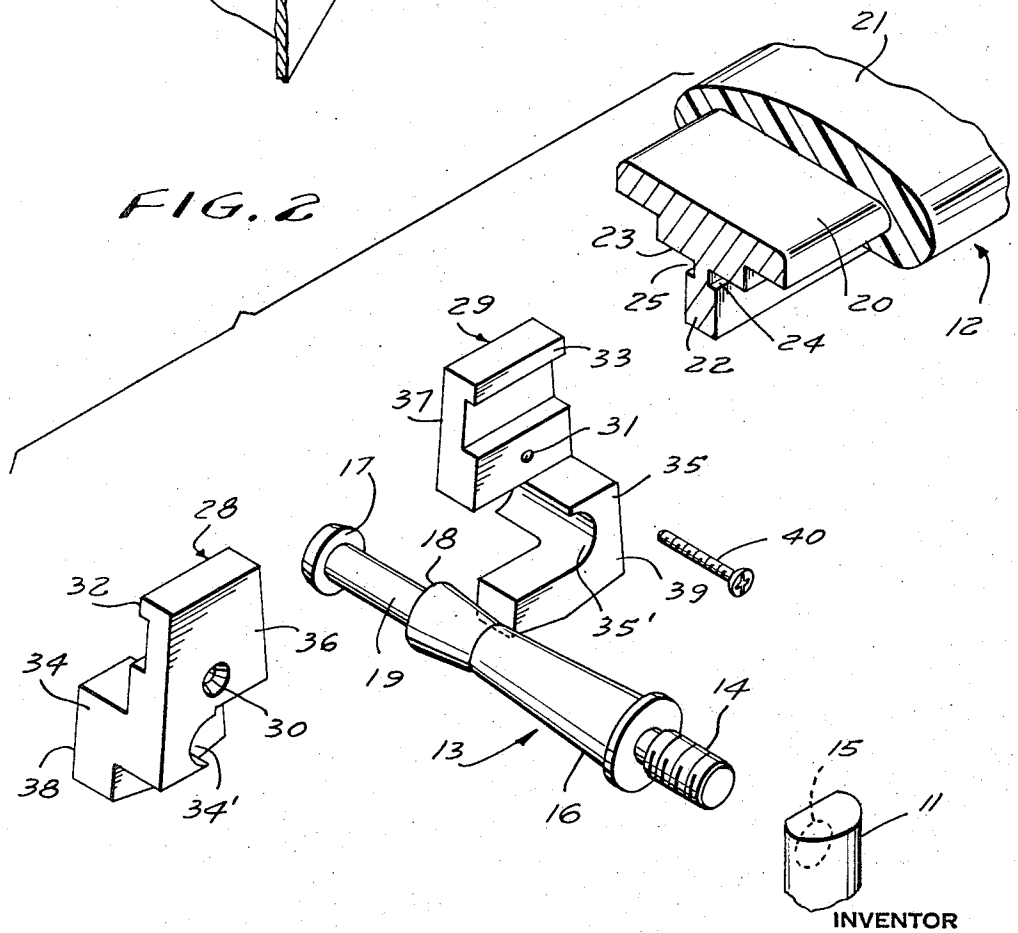


FIG. 1

FIG. 2



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FIG. 3

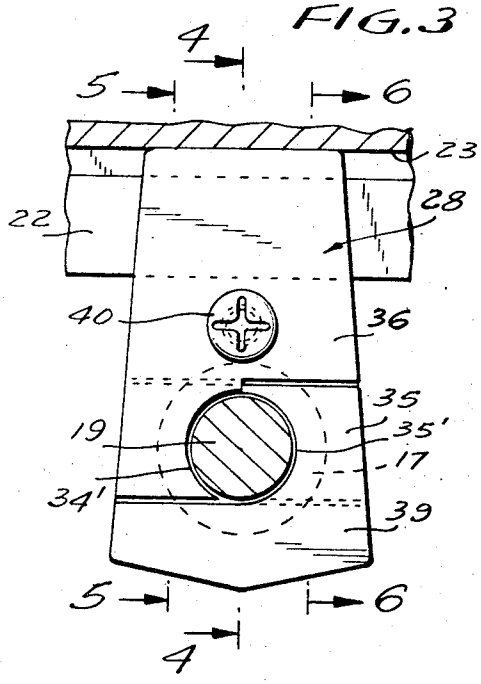
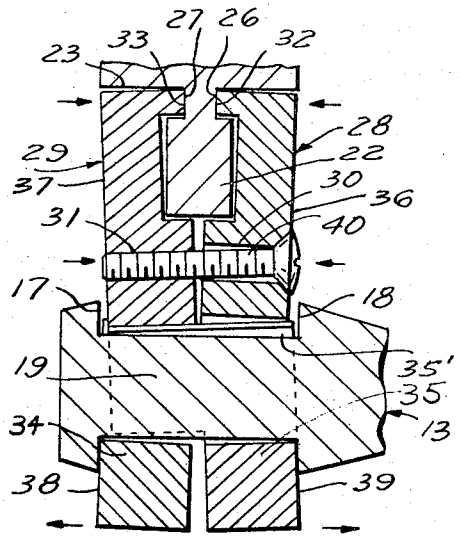


FIG. 4



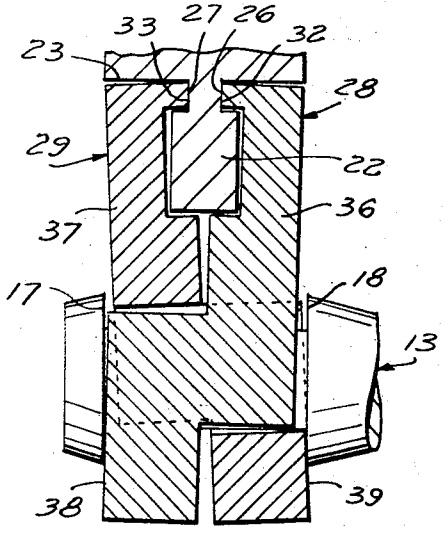


FIG. 5

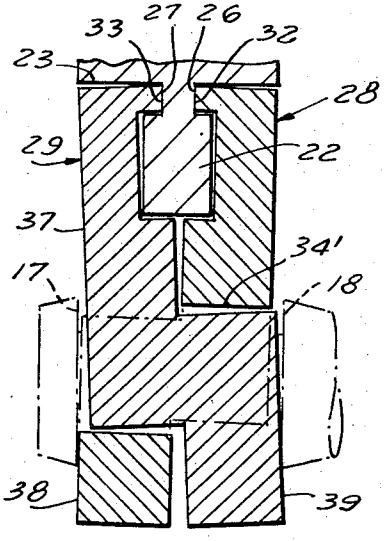


FIG. 6

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United States Patent Office 3,379,414 Patented Apr. 23, 1968

3,379,414

HANDRAIL ASSEMBLY

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Filed Sept. 2, 1966, Ser. No. 576,926
6 Claims. (Cl. 256—68)

This invention relates to a clamp assembly, and more particularly to an architectural clamp assembly for use in mounting hand rails or the like to stanchions or other support means.

Heretofore, the attachment of handrails or like elements to stanchions or struts extending from a bulkhead or a wall has required a great detal of fabrication at the construction site. For instance, in the installation of a typical balustrade incorporating a handrail supported at various points, it is necessary for individual connections to be effected between the support struts and spaced points along the rail. Such connections have typically required a drilling of the handrail at the job site at positions matching the positions of the stanchions, and attachment of the rail as by bolting to the individual stanchions. These operations of course require a temporary positioning of the rail adjacent the stanchions while measurements are effected, and a subsequent processing of the rail and assembly. If any of the operations are not carefully carried out, the appearance of the handrail and/or stanchions will be marred and it is altogether possible that redrilling and repositioning of the parts may be required.

A further difficulty inherent in the construction of balustrades and like structures heretofore known lies in the fact that often the handrail components thereof are of extended lengths and are thus unwieldy to handle and, particularly, to maintain in temporarily aligned position for purpose of effecting measurements and during installation.

Similarly, assembly of drilled units of extended lengths requires the services of a plurality of workmen, some of whom must hold the unit in position while others effect the actual assembly.

Furthermore, once the drilled unit has been assembled it is impossible to adjust or reposition the same without repeating the entire operation, including measurement, redrilling, etc.

It is therefore an object of the present invention to provide an architectural assembly and clamp therefor whereby the connection between support struts or stanchions and an elongated handrail or similar structural element may be effected, without the necessity of drilling or otherwise processing the rail at the job site.

A further object of the invention is the provision of a clamp which may be used to support a structure, such as a handrail, at spaced areas along the length thereof and wherein the attachment requires no tools other than a simple screw driver.

A further object of the invention is the provision of an improved attachment device for securing a handrail to spaced stanchions whereby the rail may be temporarily supported by attachment to a few of the stanchions, and other connector members linking the handrail to the stanchions may be subsequently added to complete the assembly.

Still a further object of the invention is the provision of a novel, multi-part clamp assembly which may be secured between a strut extending from a stanchion or the like and a handrail or the like, the clamp being insertible into locking engagement with the strut and handrail by movement of the clamp parts in a direction longitudinally of the handrail.

Still a further object of the invention is the provision

of a clamp for attachment between a stanchion and a handrail wherein no processing of the handrail is required, so that if it becomes necessary subsequently to shift the position of the handrail, this may be done without leaving tell-tale marks indicating the prior position.

According to the invention, these objects are accomplished by the arrangement and combination of elements hereinafter described and more particularly recited in the claims.

In the accompanying drawings in which is shown one of various possible embodiments of the several features of the invention,

FIG. 1 is a perspective view of a staircase depicting the balustrade assembly in accordance with the invention,

FIG. 2 is an exploded perspective view of the handrail clamp and strut in accordance with the invention,

FIG. 3 is a sectional view on an enlarged scale taken on the line 3—3 of FIG. 1, and

FIGS. 4, 5 and 6 are vertical sections taken, respectively, on the lines 4—4, 5—5 and 6—6 of FIG. 3.

According to the invention, 10 represents a conventional staircase to which a series of vertical stanchions or like supports 11 have been fixedly secured at spaced intervals. An elongated handrail 12 is supported at spaced points along its length by attachment to struts 13 extending from the stanchions 11.

While the illustrated embodiment of the invention depicts struts 13 extending from the upper end of stanchion members 11, it will be readily understood that such struts may extend directly from a wall, bulkhead or the like.

The struts 13, which are secured to the upper end of the stanchions 11 as by a threaded segment 14 engageable within complementary threaded apertures 15 at the upper end of the stanchions, include, in addition, a spacer extension 16 for offsetting the handrail a desired distance from the stanchions. The end of the spacer extension 16 is defined by a pair of inwardly directed, annular support shoulders 17, 18 separated by a reduced neck portion 19.

The handrail 12 which is to be attached to the strut 13 by a clamp assembly next to be described, includes an elongated core 20 which is optionally but preferably comprised of an extrusion of aluminum or the like, the core including the usual decorative, anti-friction covering member or cap 21.

The core 20 of the rail 12 incorporates a generally T-shaped portion defined by a downwardly directed branch 22 extending beneath the base 23 of the rail. The branch 22, at its junction with the base 23, includes undercut laterally directed side portions or channels 24, 25, the laterally directed or sidewisely disposed faces thereof, 26, 27 respectively (FIGS. 4, 5) defining longitudinally extending spaced-apart support shoulders. For convenience, the shoulder 26 will be referred to as the outer support shoulder and 27 as the inner support shoulder.

A clamp assembly, next to be described, connects the T-shaped under portion of the rail to the end portion of the strut 13. The clamp assembly includes separable clamp elements 28, 29, which elements are identical with the exception that element 28 incorporates a laterally directed bore 30, countersunk at its outer end, whereas the element 29 includes an internally threaded bore 31.

The clamp elements 28, 29 include at their upper ends, inwardly directed upper clamp faces 32, 33 respectively, the faces being laterally offset from the main body of the clamp so as to permit them to enter into the undercut portions 24, 25 on the opposite sides of the rail assembly and bear, respectively, against the longitudinally extending shoulders 26, 27.

The body portions of the clamp elements 28, 29 include offset lower sections 34, 35. The lower sections are offset so that the lower section 35 of the clamp

member 29 is aligned essentially in the same plane as the main or upper body portion 36 of the clamp member 28. Conversely, the lower section 34 of the clamp member 28 is offset and aligned with the upper portion 37 of the clamp member 29. The upper and lower portions of the clamp elements, when viewed in side elevation with the clamp elements juxtaposed, are spaced apart, defining access apertures 34', 35' which are generally U-shaped, the spacing between said upper and lower portions being calculated to provide slight clearance when the neck portion 19 of the strut is disposed between said upper and lower portions.

The clamp members 28, 29 include lower clamp faces 38, 39 respectively, which, in the secured position of the clamp, tightly bind against the inner and outer annular shoulders 17, 18 respectively of the struts.

The clamp assembly is employed as follows:

A plurality of upright stanchions 11, having strut members 13 threadedly connected thereto, are affixed in such position that a line through the extending strut members is parallel to the desired position of the handrail. The handrail may then be positioned above the strut members and the elements 28, 29 inserted into the grooved or channeled portions 24, 25 in the branch 22 of the handrail. This assembly is facilitated by the slidable relationship of lip or clamp jaw 32 within channel 24 and of lip or clamp jaw 33 within channel 25.

The jaws are spaced along the length of the rail so that each clamp member is disposed to the opposite side of reduced neck portion 19 of the strut. The clamp jaws are then assembled to each other by sliding the same longitudinally toward the neck so that the U-shaped portions 34', 35' of the clamp members 28, 29 surround the neck.

As best seen in FIG. 4, the construction of the clamp members 28, 29 is such that the bottom portions 34, 35 thereof lap each other in one direction and the upper portions 36, 37 of the jaws overlap each other in the opposite direction.

From the foregoing it will be evident that when the clamping members slide sufficiently inwardly or toward the neck portion, the lower portions 38, 39, respectively, will be interposed between the annular shoulders 17, 18 to prevent lateral movement of the clamp members with respect to each other. With the clamp members thus positioned, a locking bolt 40 may be passed through the slightly oversized aperture 30 of the member 28 and threaded into the aperture 31 of the member 29.

It will be evident that the connection of this bolt will prevent any longitudinal relative movement between the clamp members 28, 29, it being understood that until the bolt is fully tightened in the manner hereinafter set forth, a longitudinal relative movement between the handrail and the clamp members is permitted. Likewise, prior to such tightening, the now united clamp members 28, 29 may be rotated or pivoted about the neck portion 19 of the strut.

From the foregoing it will be clear that by connection of a single clamp member with the rail and with the strut, the rail will be secured to the strut while still being permitted a range of pivotal and slidable movement with respect thereto. This pivotal and slidable movement permits a single worker to apply, without complete tightening, a clamp member between a strut and the handrail adjacent one end thereof, for instance, and thereafter to apply a second clamp member at a spaced position to the first applied clamp without fear that the handrail will fall clear of the support struts.

The clamp is shown in fully tightened position in FIGS. 4, 5 and 6. As is clear from FIG. 4, in particular, the assembled clamp members 28, 29 assume a somewhat X-like configuration. When the bolt 40 is tightened, the upper clamp faces 32, 33 are pressed tightly against the outer and inner shoulders 26, 27 respectively. With further tightening of the bolt, the engaged portions of the clamp and rail form a fulcrum, permitting a swinging movement of the clamp elements about the engaging portions 32, 26 and 33, 27. As a result of this pivotal or swinging movement, lower clamp face 38 is forced outwardly into tight engagement against annular shoulder 17 on the strut 13 and clamp face 39 is pressed tightly against the annular shoulder 18 of such strut. Thus, it will be seen that due to the stresses set up by tightening the bolt, the clamp, strut and handrail are locked in a desired position with respect to each other.

Furthermore, as the upper clamp faces extend into the associated channels 23, 24, the upper and lower walls thereof which define guide walls will limit upward and downward movement of the clamp faces in said channels.

From the foregoing it will be clear that assembly of the balustrade structure in accordance with the invention is greatly simplified as contrasted with assemblies heretofore known wherein the rail must be supported in the desired position drilled and bolted.

A great deal of flexibility with respect to the order of assembly is permitted by the device of the present invention. For instance, it is possible to secure the handrail in desired position by applying the upper and lowermost clamp members and tightening the members when the rail is properly located. Thereafter the clamp members may be applied to connect the rail at various spaced points to the extending struts, such application being greatly facilitated by the two part construction of the clamp members which permits of longitudinally sliding the same into position and subsequent integration by the bolt.

As previously noted, the device has the further advantage that by only partly tightening the initially applied clamp member or members, it is possible temporarily to secure the handrail at a desired position and thereafter effect small or large corrections of this position without drilling or re-drilling of the rail, as is the case with devices heretofore known.

Moreover, it is feasible for even very large handrails to be applied by one or two workers, since the elimination of the drilling step obviates the necessity for a multiplicity of workers to hold the rail in the desired end position to permit measurements for drilling, etc.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A handrail assembly for mounting an elongated handrail or the like to a support, said handrail comprising a track portion having inner and outer, longitudinally extended, spaced apart inner and outer support shoulders, a strut having an end fixed to said support and a free end in spaced relation to said track portion, said free end of said strut including inner and outer opposed shoulder portions connected by a reduced neck, a clamp member clampingly connecting said track portion and strut, said clamp member including first and second clamp portions slidably interfitting with each other and surrounding said neck by movement of said clamp portions longitudinally of said track toward said neck, each of said clamp portions including an upper and a lower clamp face, the upper clamp faces of said first and second clamp portions engaging an inner and an outer support shoulder of said rail, respectively, and the lower clamp faces of said first and second clamp portions engaging an outer and an inner shoulder portion of said strut, respectively, and fastener means connecting said clamp portions for moving said upper clamp faces toward each other in a direction at right angles to the longitudinal axis of said track portion, thereby to urge said upper clamp faces inward-

ly toward said support shoulders, and said lower clamp faces outwardly against said opposed strut shoulders.

2. An assembly in accordance with claim 1 in which said fastener means comprises a screw extending through both of said clamp portions between the upper and lower clamp faces and more closely adjacent the upper clamp faces.

3. An assembly in accordance with claim 1 wherein each of said clamp portions includes an open slot portion insertible endwise over said neck portion.

4. An assembly in accordance with claim 1 wherein said handrail has a base with a depending longitudinal portion having undercut side portions defining open channels the opposed faces of which define the support shoulders of said track portion said channel portions defining, in addition, upper and lower guide walls adjacent said base, the upper clamp faces of said clamp portions including upper and lower surfaces disposed adjacent said upper and lower guide walls, thereby to limit upward and downward movement of said clamp faces in said channels.

5. A clamp for securing an elongated rail member having outwardly directed channel portions to a support strut having opposed, inwardly directed shoulders separated by a reduced diameter neck portion, said strut being spaced from said channel portions of said rail, comprising first and second identical clamping portions having inwardly directed lip portions at their upper ends, each of

said lip portions being slidably disposed in a different one of said channel portions, longitudinally extended, open ended slot means adjacent the lower ends of said clamp portions, said slot means being slidable over said neck portion by longitudinal movement of said clamp portions toward each other along said rail member, with said lip portions disposed in said channels, and fastener means adjustably connecting said clamp portions for shifting said lip portions inwardly to grip said channels, and said lower ends of said clamp portions outwardly against said opposed shoulders.

6. A clamp in accordance with claim 4 wherein the combined thickness of said clamp portions adjacent said slot means is approximately equal to the spacing between said opposed shoulders.

References Cited

UNITED STATES PATENTS

2,263,554	11/1941	Brach.	
2,904,314	9/1959	Thom	256—65
2,905,446	9/1959	Blum	256—69 X
2,924,089	2/1960	Reiland.	
3,084,893	4/1963	Ruth	248—228

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