

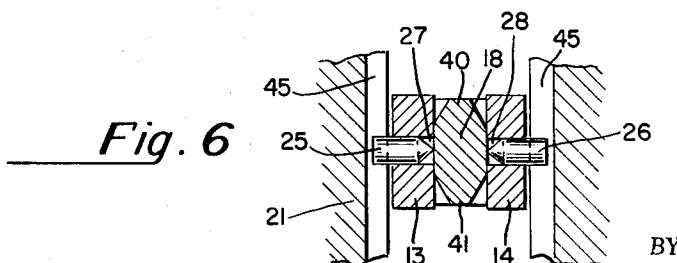
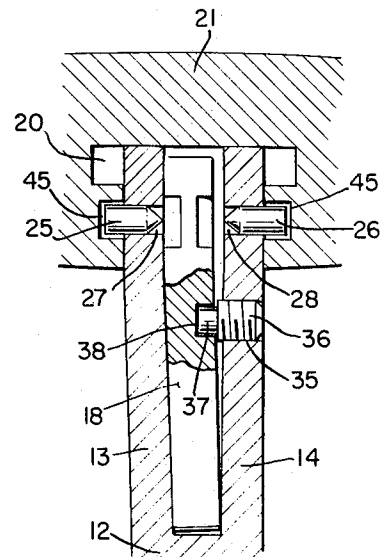
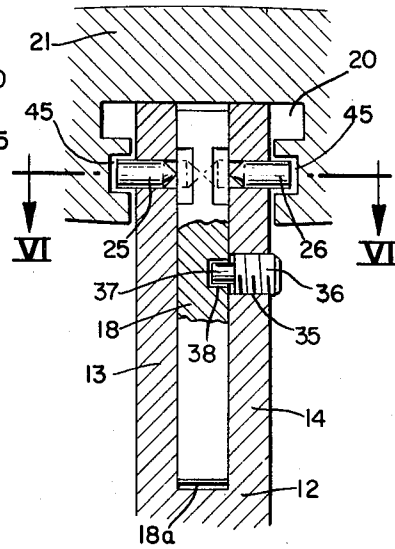
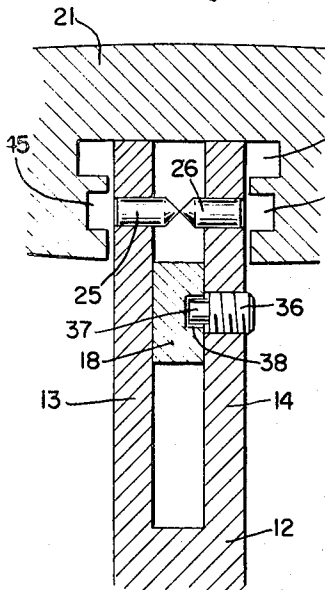
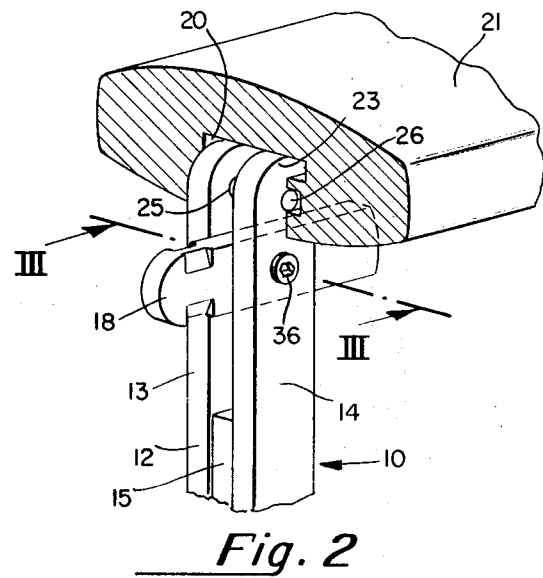
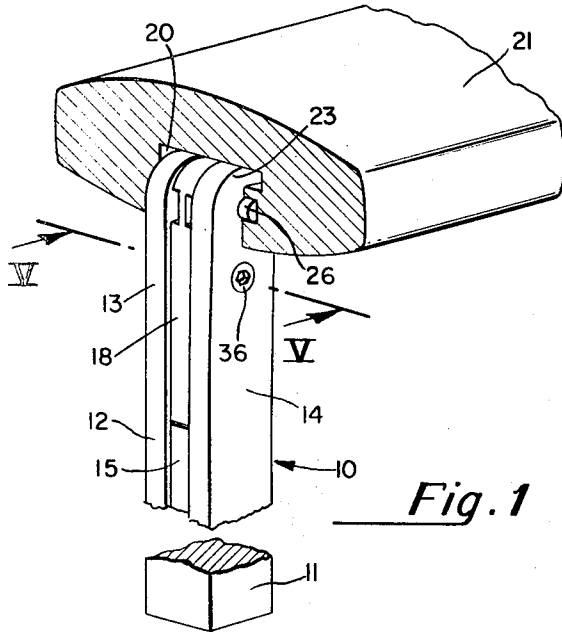
June 23, 1970

W. J. HORGAN, JR
HANDRAIL SUPPORT MEANS

3,516,644

Filed June 23, 1969

3 Sheets-Sheet 1



INVENTOR.
William J. Horgan, Jr.

BY
Paul & Paul
ATTORNEYS.

June 23, 1970

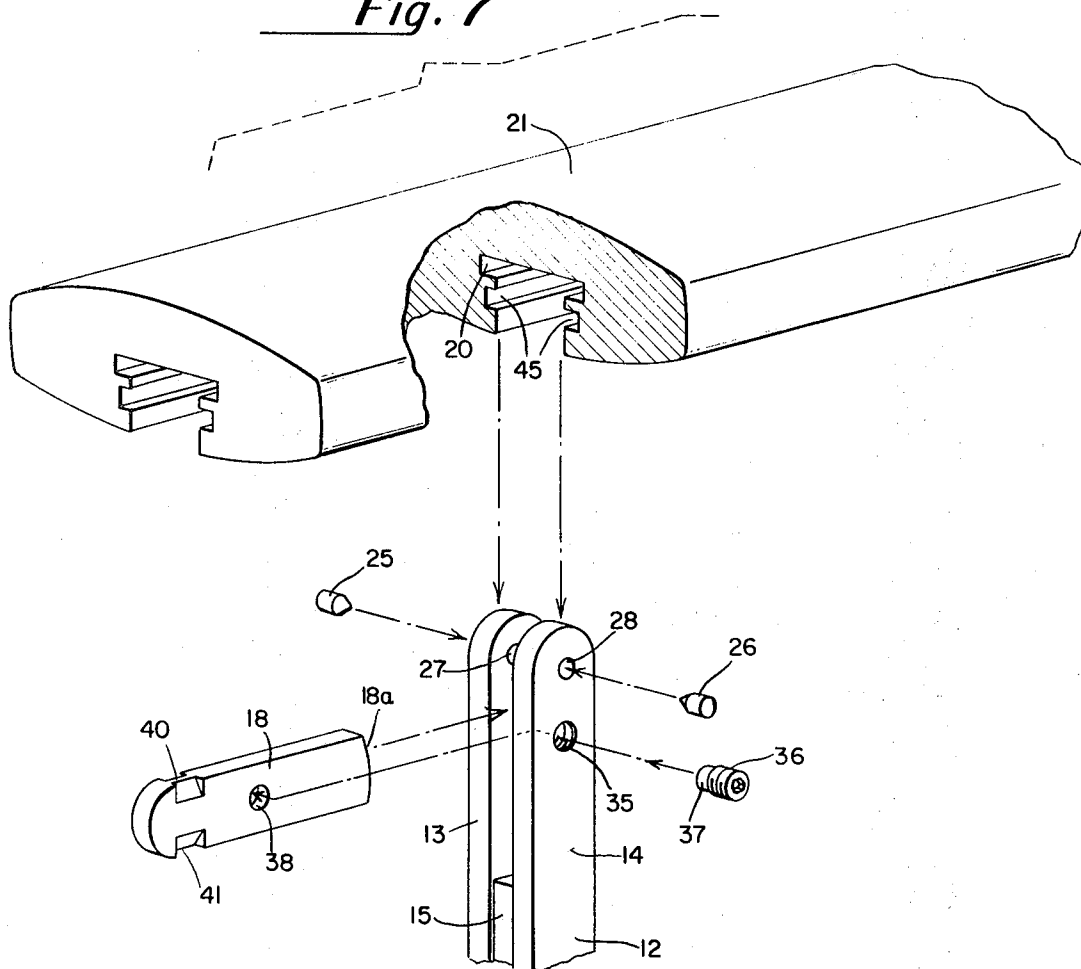
W. J. HORGAN, JR
HANDRAIL SUPPORT MEANS

3,516,644

Filed June 23, 1969

3 Sheets-Sheet 2

Fig. 7



INVENTOR.

William J. Horgan, Jr.

BY

Paul & Paul

ATTORNEYS.

June 23, 1970

W. J. HORGAN, JR
HANDRAIL SUPPORT MEANS

3,516,644

Filed June 23, 1969

3 Sheets-Sheet 3

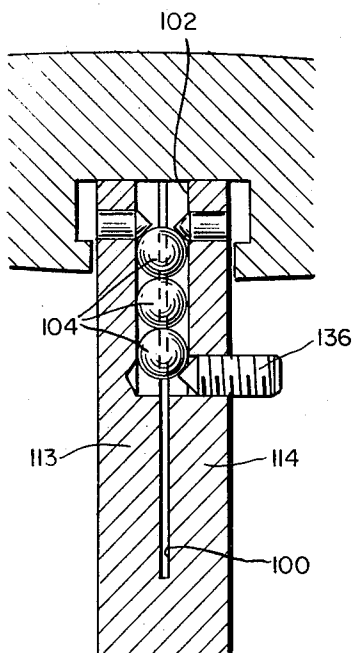


Fig. 8

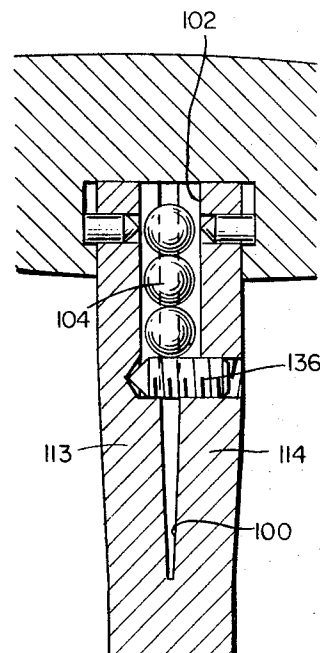


Fig. 9

INVENTOR.

William J. Horgan, Jr.

BY

Paul + Paul

ATTORNEYS.

1

3,516,644

HANDRAIL SUPPORT MEANS

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa., a firm of Pennsylvania

Continuation-in-part of application Ser. No. 733,083, May 29, 1968. This application June 23, 1969, Ser. No. 840,125

Int. Cl. E04h 17/16

U.S. Cl. 256—65

14 Claims

ABSTRACT OF THE DISCLOSURE

A handrail has a slot in its underside, for reception of the upper end of a post. The slot is substantially T-shaped with the addition of an intermediate, horizontal leg. The end of the post is forked by a single, vertical slot. On either side of the slot there is a hole completely through the side wall of the post. The holes are spaced from the rounded, terminal portion of the post, so that when the post is inserted into the T-shaped slot of the handrail, the holes will be opposite to the intermediate, horizontal leg of the slot. A pin is disposed in each hole having a conical point protruding into the vertical slot. Means are disposed in the slot to engage the conical points of the pins and force them into the horizontal grooves of the intermediate leg of the T-shaped slot in the handrail. In one embodiment this means comprises a pivotally mounted cam arm. In another embodiment it comprises a plurality of balls. In both embodiments a set screw is tightened to force the forked end of the post to spread and firmly engage the side walls of the slot in the handrail.

CROSS-REFERENCES TO RELATED APPLICATIONS

This application is a continuation-in-part of my prior copending application Ser. No. 733,083, filed May 29, 1968.

BACKGROUND OF THE INVENTION

This invention relates to a means for attaching a handrail to a post, and more particularly, to means for use with handrails supported by posts disposed in slots along the underside of the handrail.

In the construction of buildings in which ornamental railings are used, it is customary to design stairways and railings for stairways, and then to construct the stairway and mount the fabricated railing on the stairway. It is not uncommon for discrepancies to develop between the stairway drawings and the stairways as actually constructed and installed. These discrepancies make it difficult to mount the fabricated railing in accordance with the original plans. It is extremely desirable in the field of ornamental railings to have the highest degree of adjustability possible in the railings themselves, so as to enable adjustment of the fabricated railings during installation of the preconstructed stairway.

As the art has most recently developed, handrails in a variety of shapes have come to be constructed with slot means in the underside thereof for reception of various means which may be referred to as support means or connector means or adaptor means, which are designed to connect the handrail to whatever support structure is provided; be it a post or a baluster connected to the stair tread, or the floor, or a support means connected to the wall. Such a means it described and claimed in U.S. Pat. 3,351,324, issued to L. Blum et al., Nov. 7, 1967.

The problem faced in the prior art is to provide a great deal of flexibility in installation of handrail units, particularly ornamental handrail units which require the fit-

2

tings to be attractive in appearance and not detract from the overall appearance of the handrail unit, and also which are easily installed and adjusted.

SUMMARY OF THE INVENTION

The present invention comprises a fork-shaped fitting for use on the end of a post or other support means being inserted into the slot on the underside of a handrail, said fitting having a plurality of pins slidably mounted in the end of each leg of the fork, said pins being of a size and construction that they can be disposed within the overall dimensions of the fork-shaped fitting so that the fitting can be inserted into the slot on the underside of the handrail. The fitting has means mounted between the legs of the fork to engage the pins and force them outwardly into the slot in the handrail. Means are provided, connected to at least one leg of the fork for forcing the forked legs apart, so that they firmly engage the sides of the handrail within the slot.

Accordingly, it is an object of this invention to provide an attractively ornamental fitting for use with ornamental handrailings and their support means, to connect these elements with a great deal of flexibility, and a greater ease in installation than has heretofore been known in the prior art.

This and other objects of the invention will become apparent from the following description with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective of a preferred embodiment of my invention showing the handrail fitting in operative position with a handrail and post;

FIG. 2 is a perspective similar to FIG. 1 showing the fitting in an alternate position;

FIG. 3 is a view, taken as indicated by the lines and arrows III—III in FIG. 2;

FIG. 4 is a section, similar to FIG. 3, with a portion of the handrail fitting in an alternate position;

FIG. 5 is a section, taken as indicated by the lines and arrows V—V in FIG. 1;

FIG. 6 is a view taken as indicated by the lines and arrows VI—VI in FIG. 4;

FIG. 7 is an exploded view of the parts of the handrail fitting and handrail shown in the previous figures;

FIG. 8 is a view similar to FIG. 3 showing an alternate embodiment of my invention; and

FIG. 9 is a view similar to FIG. 5 showing the alternate embodiment of FIG. 3 in a different position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1, a handrail support means is shown in the assembled position with an ornamental handrailing and post. The support means comprises a fitting designated 10 which can be mounted or affixed in any suitable fashion (as illustrated by the broken lines) on any type of post 11 or baluster, or can be attached or affixed to an adaptor, which in turn can be affixed to the rail support (see for example Blum et al. Pat. No. 3,351,324). The fitting consists of a forked member 12, which is preferably a unitary structure having upwardly extending side walls or flanges 13 and 14, which are attached to a base 15, and are preferably made of stainless steel or a similar material having a degree of flexibility. The upper end of the forked member 12 fits within the slot 20 in the handrail 21. In the embodiment shown in the figures wherein the fitting is essentially rectangular in overall cross section, the upper terminal end is rounded as at 23.

In each side wall, there is a small pin (25 and 26) slidably mounted in holes (27 and 28 respectively) within the fitting, which pins are preferably made of stainless

steel or similar material. The pins are substantially cylindrical but the inwardly opposed ends are conical.

In accordance with my invention means are disposed within the fork-shaped member for engaging the conical ends of these pins and driving them outwardly into the T-shaped slot in the handrail. In the embodiment shown in FIGS. 1 through 7 this means comprises a cam arm 18. This arm is pivotally mounted about the shoulder portion 37 of the set screw 36 which is threadedly engaged in the threaded hole 35 passing through the wall 14 of the fork member 12.

Prior to inserting the upper rounded portion of the fitting 12 into the T-shaped slot in the handrail, the cam arm is pivoted to the position shown in FIGS. 2 and 3, and the pins 25 and 26 are pushed inwardly so that they are disposed completely within the confines of the fitting. The fitting can then be inserted into the slot. The cam 18 has two beveled edges, 40 and 41 (FIG. 6), to engage the conical portions of the pins upon pivoting of the cam arm about the shoulder 37. The end 18a of the cam arm is slightly curved to allow entry of the cam arm into the open portion of the fork, and allow the cam arm to clear the base of the fitting.

Referring to FIG. 5, at the end of the set screw there is a reduced shoulder, as at 37, which extends into a hole 38 in the cam arm 18. When the set screw is advanced in the hole 35, the blind end of the hole 38 engages the end of the shoulder 37 of the set screw, and as the set screw is further advanced, the side walls of the forked member 12 are separated by the force driving them apart. Thus the walls 13 and 14 are firmly forced against the vertical sides of the T-shaped slot in the handrail, so that they are held in fixed engagement with the handrail.

For installation purposes, the handrail fitting is first placed in the position shown in FIGS. 2 and 3. Herein the pins are fully inserted within the forked member, and the cam arm is disposed in the horizontal position being freely pivotable about the shoulder of the set screw. The forked member is in the relaxed position since the set screw has not been tightened to engage the bottom of the hole 38. The upper terminal end of the fitting 12 is positioned, so that it touches the bottom portion of the slot in the handrail.

Refer to FIGS. 4 and 6, where the cam arm has been rotated into the vertical position. In the course of rotating the cam from the position shown in FIGS. 2 and 3 to the position shown in FIGS. 4 and 6, the beveled edge 40 of the cam arm engaged the slopes of the conical portions of the pins 25 and 26 (as more clearly shown by the phantom position of the pins in FIG. 4), and as the cam arm continued to rotate, the conical portions of the pins traveled along the beveled surfaces on the cam arm, so that the pins slid outwardly in the holes 27 and 28 respectively and into the intermediate horizontal leg portion 45 of the slot.

Note that the pins fit very closely in a diametral direction, the clearance being on the order of fifteen-thousandths of an inch, and so that the plurality of pins help to align the railing over the distance which it has to run. The pins themselves are slightly undersized in the axial direction, so that they do not engage the end walls of the intermediate portion 45 of the T-shaped slot.

With the fitting in the position shown in FIG. 4, it can be slid to any place along the underside of the handrail or conversely where the fitting is attached to a fixed post, the handrail can be slid in its longitudinal direction over the fitting or can be rotated about the axis of the pins to adjust its position. Once the handrail has been placed in the desired position, the set screw 36 is tightened, thereby forcing the forked portion to spread and grip the side walls of the slot and retain the handrail.

While the upper terminal portion of the forked member has been described as rounded, and as can be seen from the figures is in close proximity to the underside

of the slot in the handrail, it will be understood that this is not necessary to the basic invention, but rather is a preferred embodiment. The function of this portion of the device is to help in aligning the pins with the intermediate horizontal leg portion 45 of the T-shaped slot prior to insertion of the pins. It will be appreciated that when the handrail portion of the railing is placed on a plurality of posts, all disposed at slightly varying angles and at slightly varying heights, the posts will not normally all engage the slot in the underside of the handrail in exactly the same manner. Thus, during installation, the rounded portion of the fitting serves a function in that, once the handrail is placed over the fitting, it can be pushed down until the underside of the slot meets the upper rounded portion of the fitting, and at that point, the person installing the handrail will be assured that the intermediate horizontal portion 45 of the T-shaped slot is substantially aligned with the pins 25 and 26. Then, when he rotates the cam arm to the vertical position, the pins will be forced outwardly into the slot.

In an alternate embodiment of my invention the means for driving the pins into the T-shaped slot comprises a plurality of balls acted upon by a set screw as shown in FIGS. 8 and 9. In these figures the forked member shown has a slot 100 which also includes an axial bore 102. The conical pointed pins are identical to those previously described. A plurality of spherical steel balls 104 are stacked in the bore so that once again the pins can be fully inserted into the forked member. The balls shown have a close sliding fit with the bore. However, it is desirable alternately to utilize a bore which is slightly oversized so that the balls can move from side to side. This allows for self-centering of the uppermost ball which engages the conical points of the pins. Either configuration will work in accordance with this invention.

The lowermost ball rests against the surface of a conical pointed set screw 136 which is threaded through the wall 114. As the screw is advanced to the left, the lower most ball will ride upwardly on the conical point of the set screw 136 thereby forcing the balls which are stacked above it upwardly in the bore 102. The uppermost ball will exert a force against the conical points of the pins driving them outwardly into the T-shaped slot.

When fully inserted as in FIG. 9 the pins will be driven outwardly to help align the fitting with the handrail as previously described. In order to spread the forked member into firm engagement with the handrail, the set screw is advanced further until it engages the opposite side wall 113. As the set screw is tightened it forces the two halves of the post apart in a manner similar to that previously described with respect to set screw 36 FIG. 5.

What is claimed is:

1. A handrail support means for a handrail of the type having a slot therein, comprising:

- (a) a forked member having a plurality of legs disposed to extend into said slot, each of said legs having at least one hole therein;
- (b) at least one pin disposed in sliding engagement in at least one of said holes in each of said legs;
- (c) means for moving the pins within said legs, so that they protrude into said slot; and
- (d) means for spreading said forked member into fixed engagement with said handrail.

2. The invention of claim 1 wherein said forked member has two legs, each of said legs having a hole therein, and said pins having opposed conical points.

3. The invention of claim 1 wherein the means for moving the pins within the legs comprises a member pivotally mounted between said legs to engage said pins and move said pins within said holes into said slot upon movement of said member about its pivot.

4. The invention of claim 3 wherein each of said pins has at least one substantially conical end which is disposed in close proximity to the similarly shaped end of the other, and said pivotally mounted member has an edge thereof

5

disposed to engage said pins along the conical surfaces thereof.

5. The invention of claim 4 wherein said pivotally mounted member has a plurality of said edges.

6. The invention of claim 1 wherein said legs have upper rounded terminal surfaces.

7. The invention of claim 1 wherein the means for spreading the forked member comprises a threaded hole passing through one of said legs, and screw means in threaded engagement with said hole having an end thereof, disposed to engage a portion of the handrail support means opposite to said threaded hole.

8. The invention of claim 3 wherein the means for spreading said forked member comprises a threaded hole passing through one of said legs and screw means in threaded engagement with said hole having an end thereof disposed to engage said pivotally mounted member.

9. The invention of claim 8 wherein said screw means coacts with said pivotally mounted member to form the pivot means about which said member is pivoted.

10. The invention of claim 1 wherein the means for moving the pins within the legs comprises at least one ball mounted between said legs for movement toward and away from said pins, and means passing through at least one wall of said forked member to engage said ball and move said ball into engagement with said pins.

11. The invention of claim 1 wherein the means for moving the pins within the legs comprises a plurality of balls movably confined between said legs, and means movably mounted with said forked member to engage

6

one of said balls and force another of said balls into engagement with said pins for moving said pins as aforesaid.

12. The invention of claim 11 wherein said last mentioned means comprises a member threaded through at least one wall of said forked member.

13. The invention of claim 12 when said threaded member comprises a screw having a conical point.

14. The invention of claim 12 wherein said threaded member is positioned to engage a portion of the handrail support means opposite to the wall in which it is threaded, to spread said forked member as aforesaid.

References Cited

UNITED STATES PATENTS

1,926,798	9/1933	Baumbach	287—20.3
2,003,144	5/1935	Graham	287—20.3 X
2,433,617	12/1947	Marsilius	287—20.3
2,904,314	9/1959	Thom	256—65
3,071,350	1/1963	Opie	256—65
3,157,378	11/1964	Blum	256—65 X
3,367,727	2/1968	Ward et al.	287—119 X
3,441,253	4/1969	Blum et al.	256—65

DENNIS L. TAYLOR, Primary Examiner

U.S. Cl. X.R.

256—222; 287—20.3