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[54] **HINGED HANDRAIL FITTING**

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[52] **U.S. Cl.** **403/73**, 256/65, 403/119

[51] **Int. Cl.** **E04h 17/14**, F16b 7/00

[58] **Field of Search** ..... 287/54 C, 54 A, 54 B, 287/14, 36 H; 16/168, 169; 256/65, 59

[56] **References Cited**

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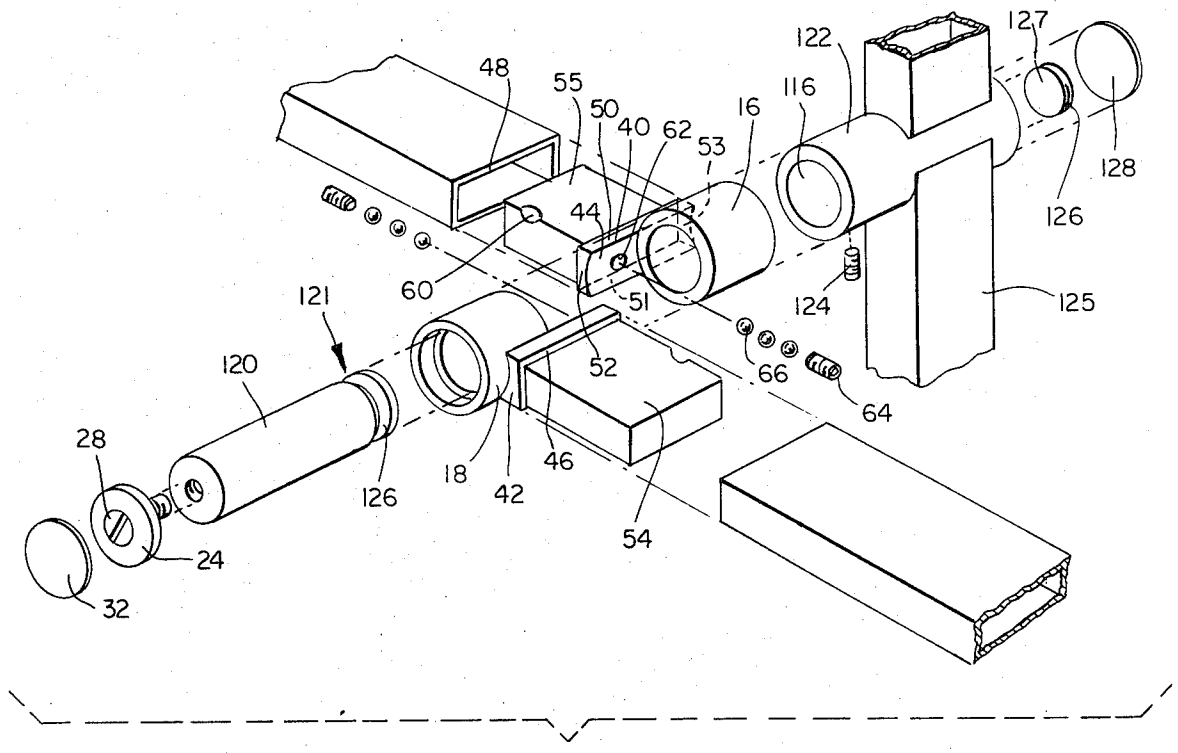
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[57] **ABSTRACT**

A handrail fitting for connecting the ends of handrail members in tandem and providing for articulation of the members with respect to one another. A plurality of rotatably connected complementary configured members having integral rail terminals and fastening means adapted to internally grip hollow handrail sections.

Adjustable rotatably means are provided for moutning the fitting to a handrail post; said means and said fitting giving the appearance of being pierced by said handrail and said post in assembled condition.

3 Claims, 3 Drawing Figures



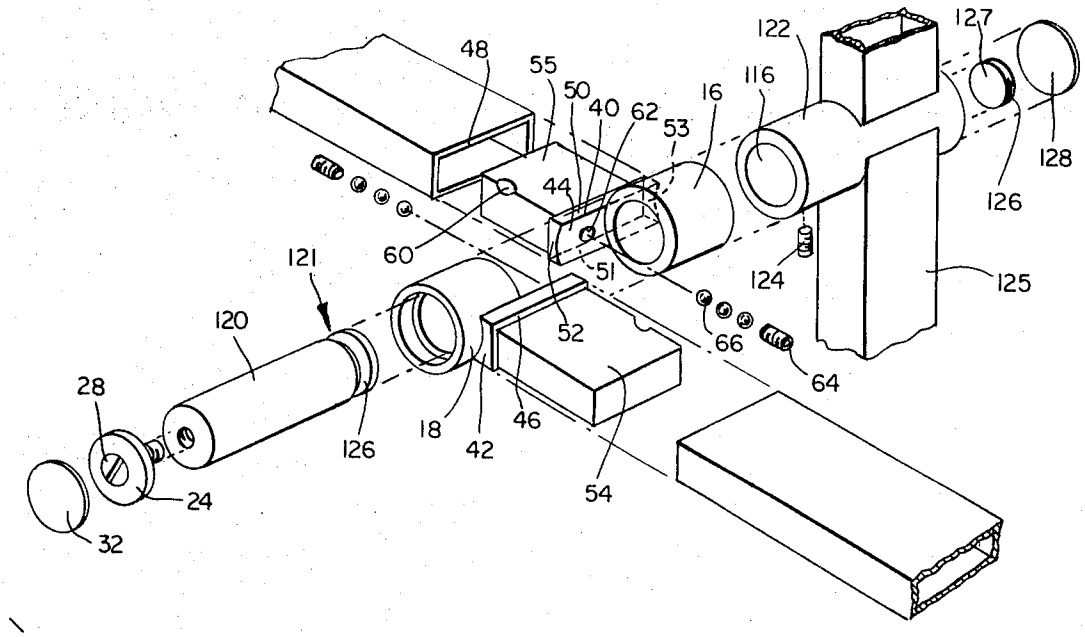


Fig. 2

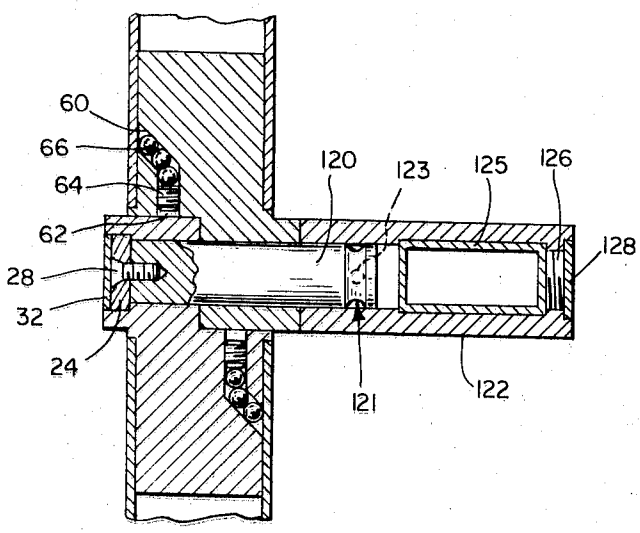


Fig. 3

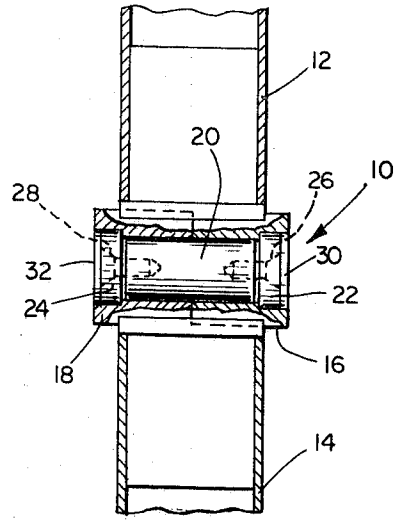


Fig. 1

HINGED HANDRAIL FITTING

BACKGROUND OF THE INVENTION

This invention relates to the ornamental handrail art; and in particular, to a fitting for connecting ornamental handrails in tandem and permitting articulation between the handrail members.

It's desirable in the ornamental handrail art to give the appearance of continuity between adjacent joined handrail sections. Accordingly, applicant has designed a new handrail fitting which, when assembled with separate handrail sections, gives the appearance of having the handrail pass through the fitting in an uninterrupted condition. Thus the handrail appears to "pierce the fitting."

It's also desirable to have some means of changing the angle between adjoining the pieces of an assembled handrail unit, such as, at the point at which the handrail unit begins to descent stairs from a balcony.

SUMMARY OF THE INVENTION

Applicant has fulfilled the desired ornamental and mechanical needs of the art by providing a fitting to connect the longitudinal ends of handrail members in tandem, comprising: a plurality of rotatably connected members with integral handrail terminals and fastening means for connecting the handrails to the fitting.

Accordingly it's an object of this invention to provide a hinged handrail fitting meeting the needs of modern day architectural applications.

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

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view partially broken away and partially shown in section of one embodiment of my invention shown in its environmental relation to handrail members;

FIG. 2 is an exploded perspective view of a fitting in accordance with another embodiment of my invention shown in its environmental relationship to handrail members and a mounting post; and

FIG. 3 is a horizontal central section of an assembly of members as shown in FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Although specific forms of the invention have been selected for illustration in the drawings, and the following description is drawn in specific terms for the purpose of describing these forms of the invention, this description is not intended to limit the scope of the invention which is defined in the appended claims.

A simple form of my invention is shown in FIG. 1. This form is modified to some extent in the embodiment shown in FIGS. 2 and 3. However, it will be appreciated that like numbers designate like parts and accordingly, with that in mind, I shall now describe the embodiment shown in FIG. 1.

The fitting is designated generally 10 and is used to join handrail members 12 and 14 (shown in section) in tandem. In the preferred embodiment of this invention the fitting is designed to join the ends of hollow handrail sections, since these are widely used in the handrail art. Basically the fittng comprises a plurality of rotatably connected members. These members 16 and 18

are cylindrical and each has an axial cylindrical through hole for reception of a cylindrical pin 20 in sliding engagement with the inner surface forming the hole. Thus the members 16 and 18 can be articulated with respect to one another about the axially disposed pin 20.

The pin is retained in place in the embodiment shown by means of retainer caps 22, 24 which are held on the ends of the pin as shown by the flat headed screws 26, 28. The retainer caps are disposed in countersunk holes and rest against shoulders as clearly shown. It will be understood that this is just one means of retaining the pin and other retaining means would be obvious in view of this disclosure. Covering the retainer caps are covering discs 30 and 32 which snap into the countersunk holes and protect the device from being tampered with.

In the alternate embodiment shown in FIG. 2, another means of securing the pin and members 16 and 18 in axial position is disclosed and will be described further hereinafter.

Integrally connected to each of the members 16 and 18 is a rail terminal 40 and 42. These terminals are identical and comprise a body extending parallel to the axis of the member having a curved surface such as 44 contiguous with the surface of the member to lie against the outer surface of the other member. In this embodiment, the cylindrical bodies are of the same diameter and therefore the curved surfaces are the same. The rail terminals extend outwardly transverse to the axis of the members and terminate in faces such as 46 which are complimentally configured to the end faces, such as 48, on the ends of the handrails which they will abut in assembled condition. The outer peripheral surfaces 50, 51, 52 and 53 are configured to match evenly with the surfaces of the handrail, so that they are contiguous when assembled. Thus, in assembled condition, the rectangular shape of the handrail appears to go right through the cylindrical shape of the fitting.

The fastening means for connecting the fitting to the rails comprises, in this preferred embodiment, a rectangular extension 54, 55 of reduced cross section which accurately slides into the envelope of the rail so that the external surfaces of the extension slide upon the internal surfaces of the hollow rail, thereby accurately positioning the handrail with respect to the terminal. Each extension has a channel formed by intersecting holes, such as 60, 62 shown in section in FIG. 3. A set screw 64 is in threaded engagement with one of the holes and a plurality of balls 66 are disposed in the holes in contact with the lead end of the set screw. As the set screw is advanced in the hole 62 the lead ball is forced out of the open end of the hole 60 and against the inner surface of the handrail. In this manner the complimentally configured members 16 and 18 can be securely fastened to the ends of the handrail members prior to being assembled as a complete fitting.

The embodiment shown in FIGS. 2 and 3 differs from that shown in FIG. 1 in that the pin 120 extends through the end of the member 16 and into the cylindrical fitting portion 122. This portion 122 is identical to a fitting portion described in my prior copending application for an Apparatus and Method for Assembling Posts and Rails, Ser. No. 229,264 filed Feb. 25, 1972 and comprises a longitudinally extending body of a generally cylindrical shape; the cylinder being of the same diameter, though not necessarily the same length, as the cylindrical portion 16. The portion 122 has an axi-

ally cylindrical hole **116** therein for reception of the axial cylindrically extending pin **120.** The cylindrically extending pin **120** has a V groove in its outer circumferential surface designated generally **121** which lies in a plane generally transverse to the axis of the pin **120.** The portion **116** and the member **16** are on coincident axes which axes are coincident with the common central longitudinally axis of the assembled fitting members **16, 18, 116.**

The body has a hole **123** FIG. 3 for reception of a set screw **124** FIG. 2 in threaded engagement therewith; the hole passing through the wall of the body and into the hole **116.** The pin **120** in its assembled condition as shown in FIG. 3 wil have the lead end of the V groove so positioned with respect to the hole **123** that the lead end of the set screw **124** will enter the V groove and engage the lead wall **126** of the V groove. Thus on tightening of the set screw **124** the parts are drawn tightly together. It will be appreciated from what has been disclosed that with the set screw just entering the hole **116,** but not tightly engaged with the V groove **121,** the parts will be retained in their axial relationship and will be free to rotate with respect to one another. The parts as shown have a close sliding fit with one another.

The fitting portion **122** has a transverse hole therein forming an envelope for reception of a post **125** in sliding engagement in its longitudinal direction. The entire cylindrical portion of the fitting in both embodiments has uniform outside dimensions and when assembled the surface of all the portions are contigious and give the appearance of being uninterrupted longitudinal while being pierced transversely.

The fitting has a separate fastening means disposed at its outer end preferable comprising an axial hole threaded through to the envelope which would contain the post and a set screw **126** threaded into the hole for axial movement toward and away from the surface of the post, having a large diameter (at least 7/16 inch) flat surface **127** for engaging and gripping along a large portion of the surface of the post on tightening of the set screw, to fix the position of the fitting portion on the post without damaging the hollow post.

A disc-like cap **128** snaps into a groove formed by counterboring the end of portion **122** (as shown in FIG. 3) and serves to cover the exposed end of the set screw.

In this alternate embodiment shown in FIGS. **2** and **3** it will be apparent that the structure provides an adjustment means which permits relative rotation between the portions of the fitting and which fixes the portions with respect to one another on a post. The envelope in the fitting in combination with a post provides a structure which gives the appearance of a post piercing the fitting, while at the same time providing a means for retaining a plurality of longitudinally extending members, such as handrails and posts, in spaced relation.

It will be understood that various changes in the details, materials and arrangment of parts which have been herein described and illustrated in order to explain the nature of this invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the following claims.

It will further be understood that the "Abstract of the Disclosure" set forth above is intended to provide a non-legal technical statement of the contents of the disclosure in compliance with the Rules of Practice of the United States Patent Office, and is not intended to limit the scope of the invention described and claimed herein.

I claim:

1. A fitting for connecting the ends of hollow handrail members, comprising:

a. a plurality of rotatably connected members, each comprising a body having a longitudinal axis with a portion thereof forming a termination means spaced from the axis and disposed along the outer surface of the body and extending beyond one end of the body in the longitudinal direction, said portion being contiguous along said extension with the outer surface of the body of the next adjoining rotatably connected member in assembled condition, said termination means extending transversely away from said longitudinal axis of said body and having a reduced cross section along that portion most remote from said axis for insertion into said hollow handrail, said termination means having the same outer configuration as said handrail so that on insertion said handrail and said termination means are disposed with their outer surfaces contiguous to one another; and

b. fastening means for connecting said rotatably connected members to said hollow handrails.

2. The invention of claim **1** wherein said fastening means comprises an adjustable gripping means within each of said bodies for gripping the inner wall of said hollow handrail in a fastening condition; said adjustable gripping means being accessible through the surface of the extension of said body which will lie contiguous with the outer surface of the body of the next adjoining rotatably connected member in assembled condition, for adjusting said gripping means.

3. A fitting for connecting the ends of handrail members to each other and to a post, comprising:

a. a plurality of rotatably connected members;

b. termination means connected to said members for abuting the ends of said handrails and conforming said handrails to said rotatably connected members;

c. fastening means for connecting said rotatably connected members to said handrails; and

d. adjustment means for permitting relative rotation between said rotatably connected members and said posts at a first setting and for fixing the members with respect to one another and said posts at a second setting, comprising a longitudinally extending body with a transverse hole therethrough forming an envelope for reception and passage therethrough of a post in its longitudinal direction; said body having an axial hole therein and a transverse hole communicating with said axial hole and having a retainer means therein adjustable to extend into said axial hole; and a pin which extends into said axial hole from said rotatably connected members; said pin having means for engagement by said retainer means to retain said pin in said axial hole; said pin having means thereon for retaining said rotatably connected members in axial position with respect to said body.

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