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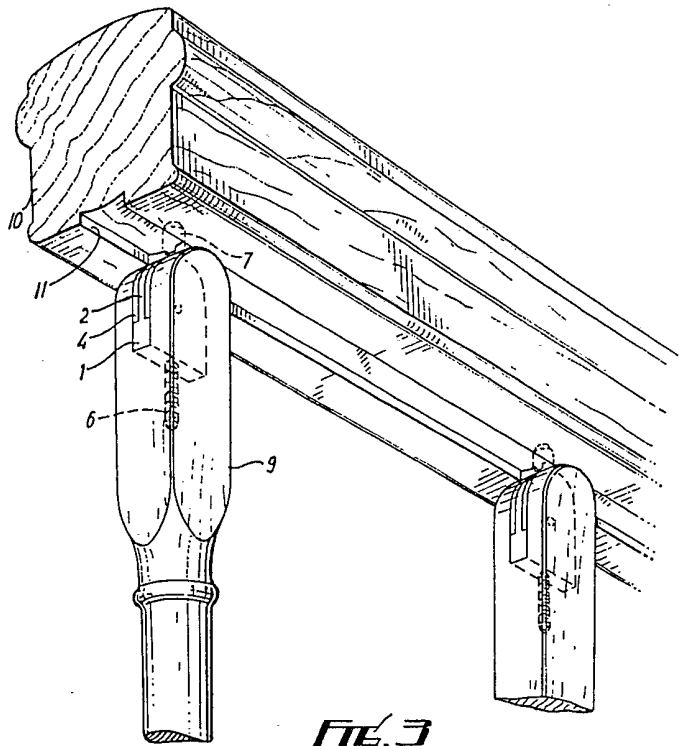
(58) Field of search

E1D

Selected US specifications from IPC sub-class E04F

(54) **Balustrades**

(57) A balustrade comprises a handrail (10), a floor or string rail and a multiplicity of balusters (9), each baluster being connected at opposite ends to the handrail and floor or string rail by means of respective hinges (3, 4).



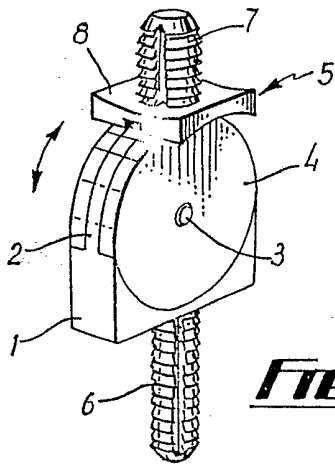


FIG. 1

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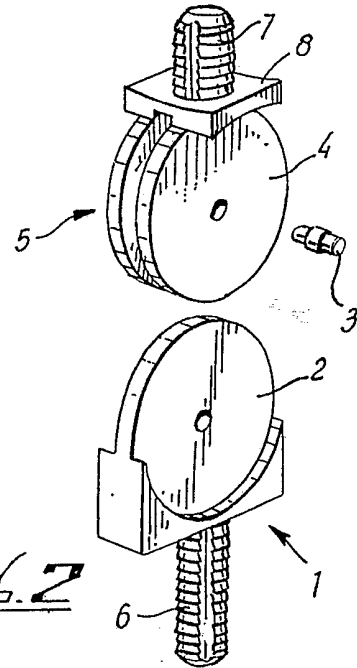


FIG. 2

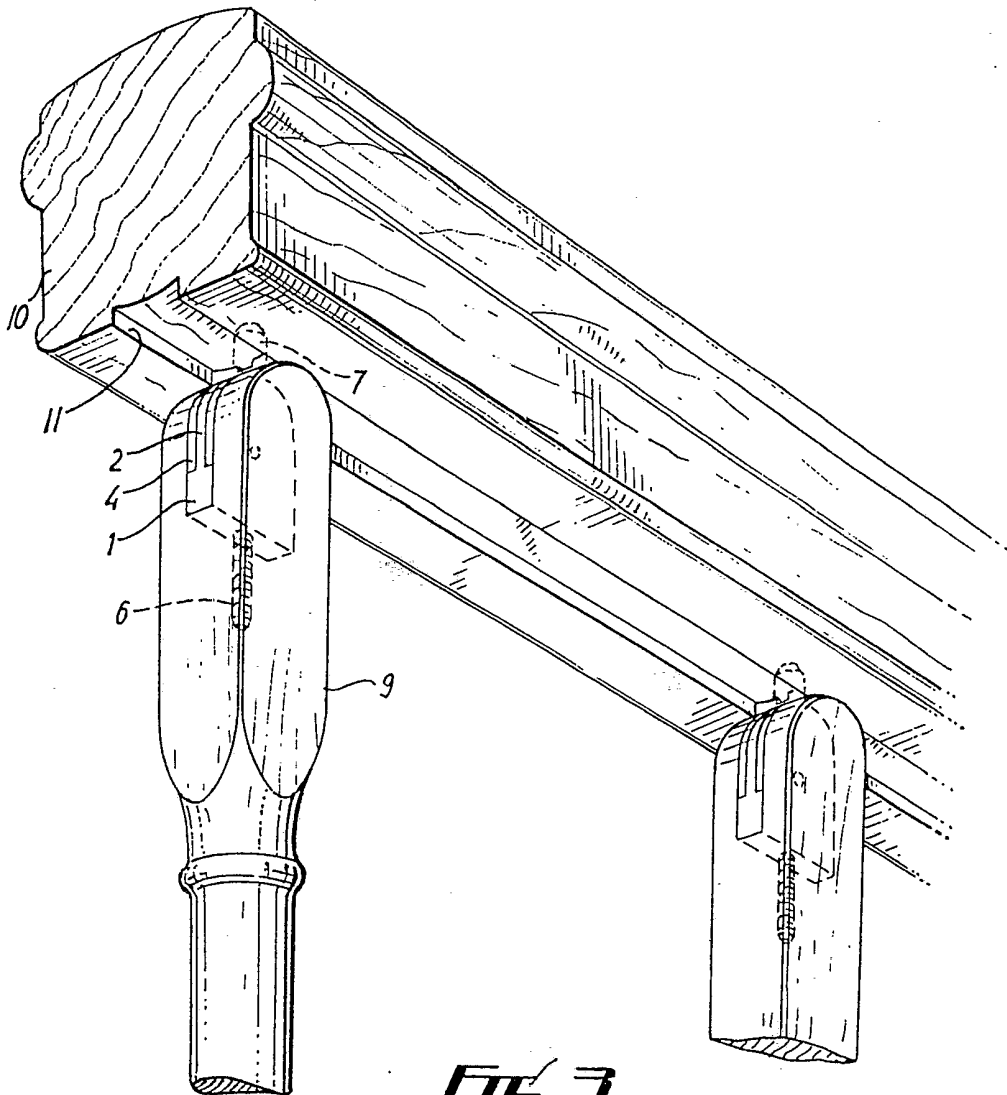
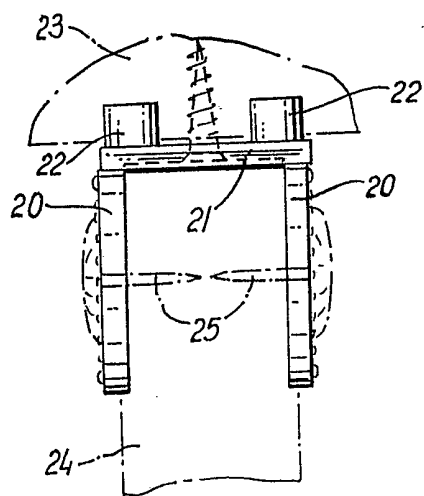
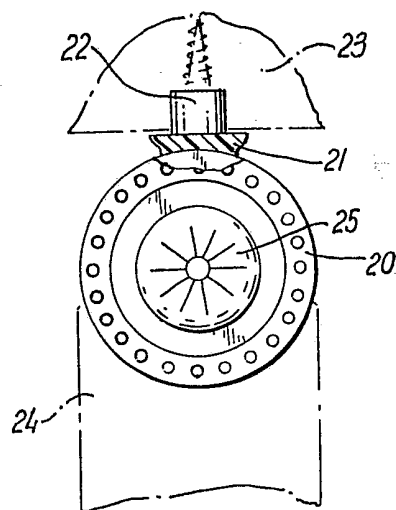
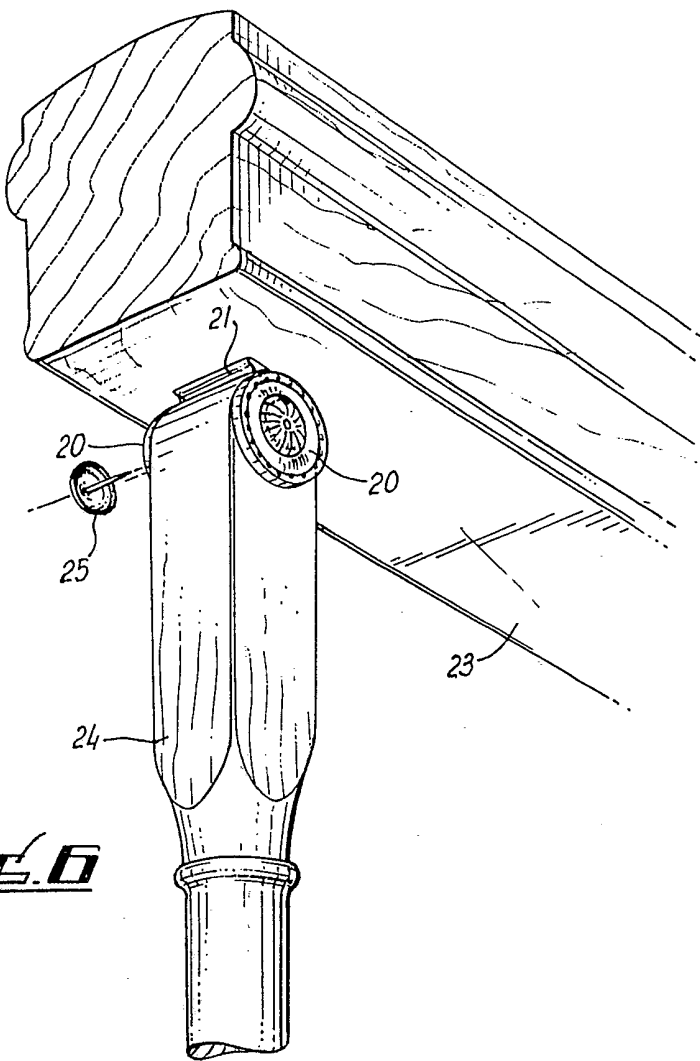


FIG. 3

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FIG. 4FIG. 5FIG. 6

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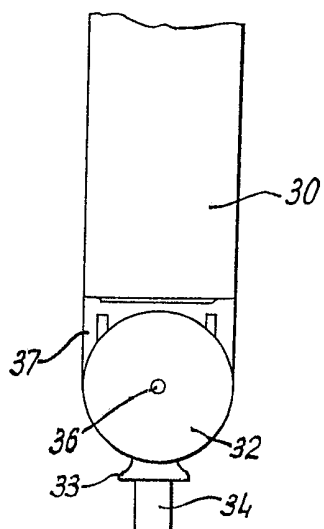


FIG. 7

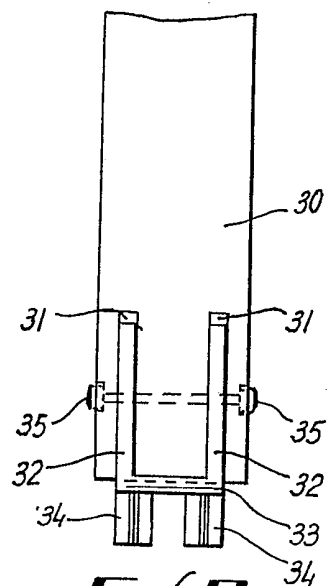


FIG. 8

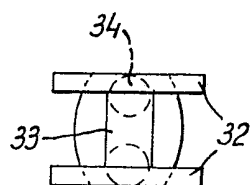


FIG. 9

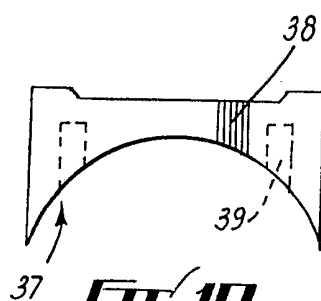


FIG. 10

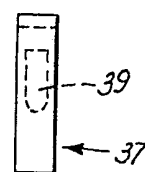


FIG. 11

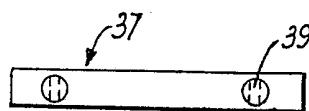


FIG. 12

SPECIFICATION

Balustrades

- 5 This invention relates to balustrades particularly but not exclusively for staircases.

- 10 Staircases and other balustrades are generally manufactured in workshops off-site. It is not uncommon to find that a staircase does not fit, perhaps due to imprecise measurement or to building work which has been carried out between measurement and the attempted installation. Alteration particularly to the pitch of the stair of a completed staircase is usually
15 difficult or impossible.

- A balustrade to a staircase or landing or gallery rail, may be delivered to the job site in two forms (a) ready assembled to a predetermined pitch or (b) in an unassembled form with all the cuts to pitch to be done on site with all the drawbacks to quality and finish.

- 20 The modern trend is method (a) due to the poor quality of site labour. The problem of delivery to site of the assembled balustrade is the pre-determined pitch to which the balustrade has to be manufactured. This cannot be altered if the staircase due to site conditions has to be slightly raised or lowered. This would mean that the balustrade would require
30 extensive modification.

- According to the present invention a balustrade comprises a handrail, a floor or string rail and a multiplicity of balusters, each baluster being connected at opposite ends to the handrail and floor or string rail by means of respective hinges.

- Use of balustrades in accordance with this invention allows the pitch of a balustrade or like construction to be varied to accommodate
40 differences between the dimensions of the staircase and the location into which it is to fit.

- The present invention may provide a balustrade to the rake of the staircase which can be adjusted to the true pitch of the staircase without a high skill requirement by site labour. A further advantage of this invention is the ability of the balustrade to be collapsed for packaging, storage and distribution, effecting
50 less damage when received at place of fixing. This is essential when the balustrade is in a stained and lacquered pre-finished form.

- The invention is further described by means of example and not in any limitative sense, with reference to the accompanying drawings of which:

- Figure 1 illustrates a hinge adapted for use in accordance with this invention;

- Figure 2 is an exploded view of the hinge;

- 60 Figure 3 is a perspective view illustrating use of the hinge;

- Figures 4 and 5 show an alternative hinge; and

- Figure 6 is a perspective view illustrating use of the alternative hinge;

Figures 7 to 9 illustrate a further alternative hinge; and

Figures 10 to 12 illustrate an insert for the hinge of Figures 7 to 9.

- 70 The hinge shown in Figures 1 and 2 is composed of a moulded plastics material and comprises a first portion 1 having a generally cylindrical leaf 2, which is rotatably mounted by a pin 3 between cylindrical leaves 4 of a second portion 5. Deformable ribbed studs 6,7 facilitate engagement of the portions of the hinge in bores in the bannister and hand or floor rail of the balustrade. The body of the first portion 1 is rectilinear to facilitate
80 engagement within a square cut slot in the bannister 9. A square or rectangular formation 8 which serves to prevent twisting of the bannister 9 relative to the rail 10 is arranged to be received into a slot 11 in the rail 10.

- 85 The upper surface of the formation may be cylindrically concave to cooperate with a correspondingly convex bottomed channel 11.

- Alternatively, the rectangular square 8 can be fitted in a rectangular hole (knowns as a mortise hole). This prevents twisting and dispenses with slot 11.

- Attachment of the opposite end of the bannister 9 to a floor engaging rail may employ a similar hinge arranged in an analogous manner.

- 95 Figures 4 to 6 illustrate an alternative metal or plastics hinge which is not concealed within the baluster. The hinge member comprises two cylindrical leaves 20 linked by a cross member 21, the latter having an aperture to receive a fixing screw and one or more projections adapted to be received into bores in the rail 23 to prevent rotation of the hinge. The end of the baluster are rounded to part cylindrical configurations to facilitate
100 movement of the hinges. The rounded end of the baluster 24 is rotatably secured to the hinge by means of pins 25 driven through apertures in the leaves 20. The heads of the pins 25 may be embossed with a decorative formation. The lower end of the baluster may be secured by means of a similar hinge.

- Figures 7 to 12 illustrate alternative hinge construction. The baluster 30 has two rectangular slots 31 cut into the end. The hinge comprises two cylindrical leaves 32, connected together by a cross member 33 which carries two ribbed projections 34 (analogous to 6 of Figures 1 and 2) for location in apertures in the rail (not shown). The leaves 32 are secured within the baluster by means of pins 35 inserted through axial bores 36 in the leaves from the exterior of the baluster.

- An insert 37, shown in enlarged detail in Figures 10 to 12 is shaped to be received in a slot 31 and to receive in turn the cylindrical leaf 32 of the hinge. The inserts 37 serves both as a bearing for the leaf and also occupies the space between the leaf and the baluster, enhancing the appearance of the balustrade.
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Grooves 38 are provided on the sides of the insert to provide a tight friction-fit with the walls of the slot 31. Apertures 39 serve to prevent distortion of the insert during moulding. Insertion of insert into the slot by means of a two-pronged tool is also facilitated.

- 5 The constructional features of the hinges shown in the various Figures may be interchanged as convenient, for example the hinge
10 of Figures 4 to 6 may be secured by means of deformable studs as shown at 6 and 7 in Figures 1 and 2 and *vice versa*.

CLAIMS

- 15 1. A balustrade comprising a handrail, a floor or string rail and a multiplicity of balusters, each baluster being connected at opposite ends to the handrail and floor or string rail by means of respective hinges.
- 20 2. A balustrade as claimed in claim 1, wherein the hinges each comprise a cylindrical leaf rotatably secured between two cylindrical leaves by means of an axial pin.
- 25 3. A balustrade as claimed in claim 1 or 2, wherein each hinge incorporates a formation arranged to prevent twisting of the bannister relative to the rail.
- 30 4. A balustrade as claimed in any preceding claim, wherein the hinge is adapted to be located in a rectangular slot in the baluster.
5. A balustrade as claimed in claim 1, wherein the hinges each comprise two cylindrical leaves located in a cylindrical insert disposed in a slot in said baluster.
- 35 6. A balustrade substantially as hereinbefore described with reference to the accompanying drawings.