# United States Patent [19]

**Chervenic et al.**

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[54] **BALUSTRADE CONSTRUCTION**


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[52] **U.S. Cl.** ..... **256/24,** 256/65

[51] **Int. Cl.** ..... **E04h 14/17**

[58] **Field of Search** ..... 256/24, 65; 52/401, 52/502, 498, 474, 476; 49/463, 466, 464, 415; 463;466;464;415/



[56] **References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 3,321,059 | 5/1967 | Kroepel | 256/24 X |
| 2,492,076 | 12/1949 | Wahle | 52/502 X |
| 2,604,675 | 7/1952 | Seaman | 49/463 X |
| 2,629,467 | 2/1953 | Fry | 49/463 X |
| 2,727,596 | 12/1955 | Smith | 49/463 |
| 3,468,516 | 9/1969 | Jounot | 256/24 |

FOREIGN PATENTS OR APPLICATIONS

| | | | |
|---|---|---|---|
| 1,386,642 | 12/1964 | France | 52/502 |



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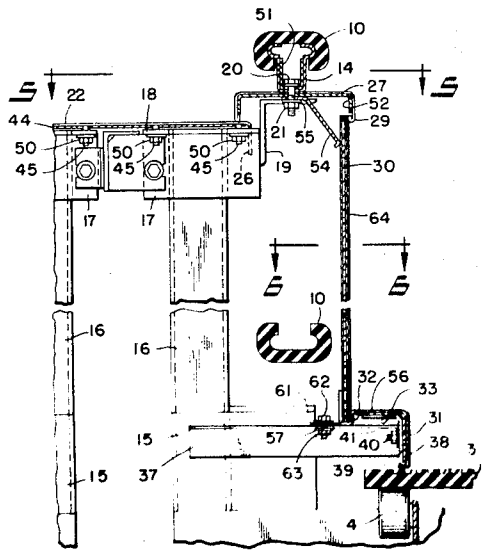
[57] **ABSTRACT**

An enclosed balustrade with no exposed fasteners having a handrail trim member along the top, sandwiched between a handrail guide and the supporting structure to which the guide is fastened. The handrail trim member has a flange at the side of the balustrade for overlapping the upper edge of a removable panel supported in a groove of a toe trim member at the lower edge. A spr1ng clip inside the balustrade holds the panel against the flange of the handrail trim member and permits removal and installation of the panel by upward movement of the upper edge between the flange and spring clip so that the lower edge can be moved into and out of the groove in the toe trim member. Along the top of the balustrade, a deck member next to the handrail trim member is held down by another downwardly extending flange of the handrail trim member engaging the surface of the deck member. Splices are located at spaced-apart positions along the balustrade with fasteners secured from the inside of the balustrade and underlying or overlying splice members covering the joints between the covering components.


**16 Claims, 12 Drawing Figures**



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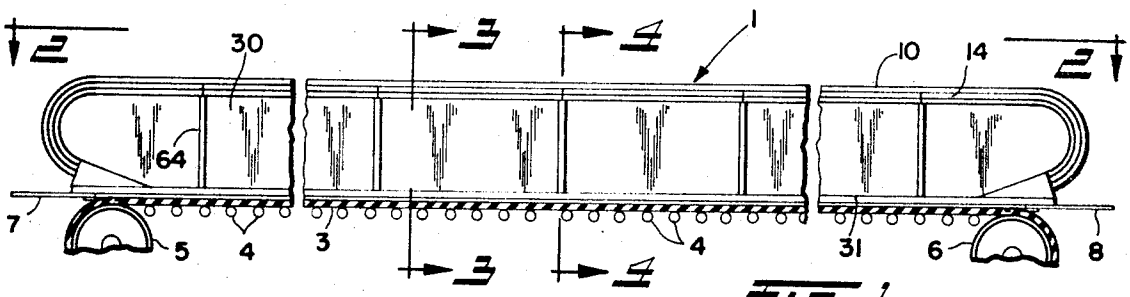


FIG. 1

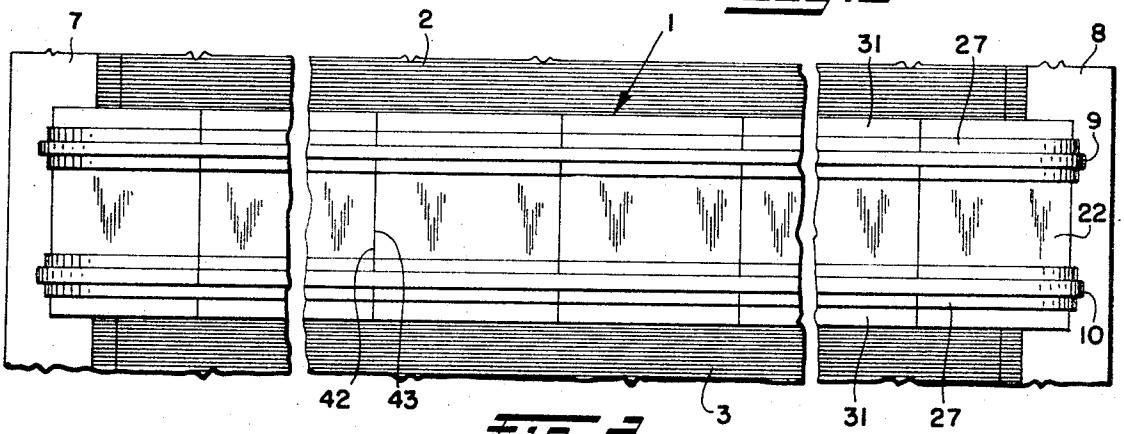


FIG. 2

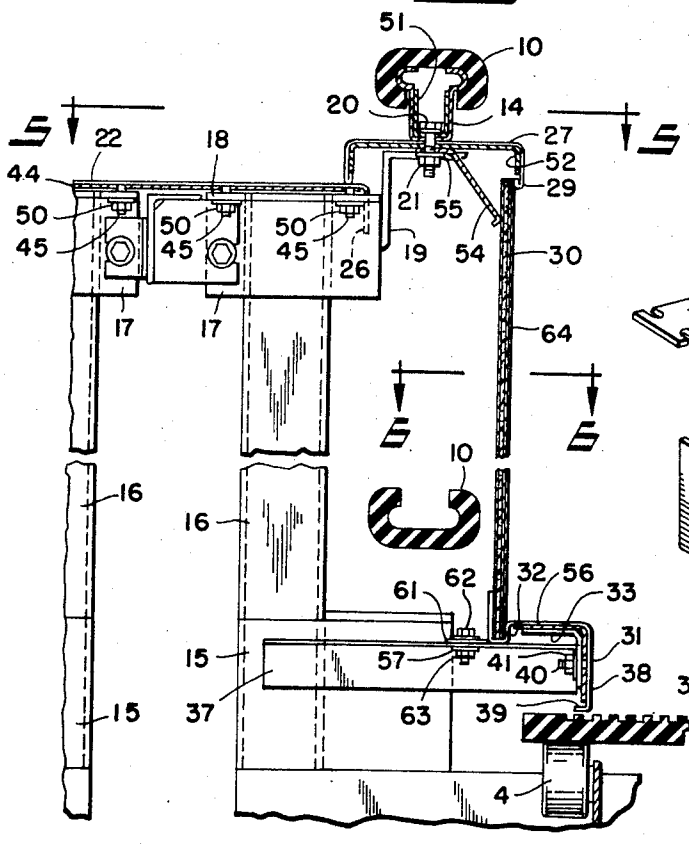


FIG. 4

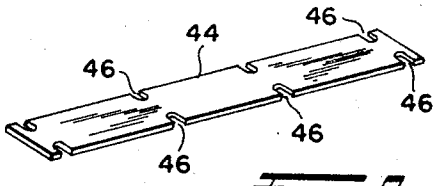


FIG. 8

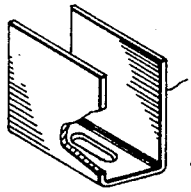


FIG. 9

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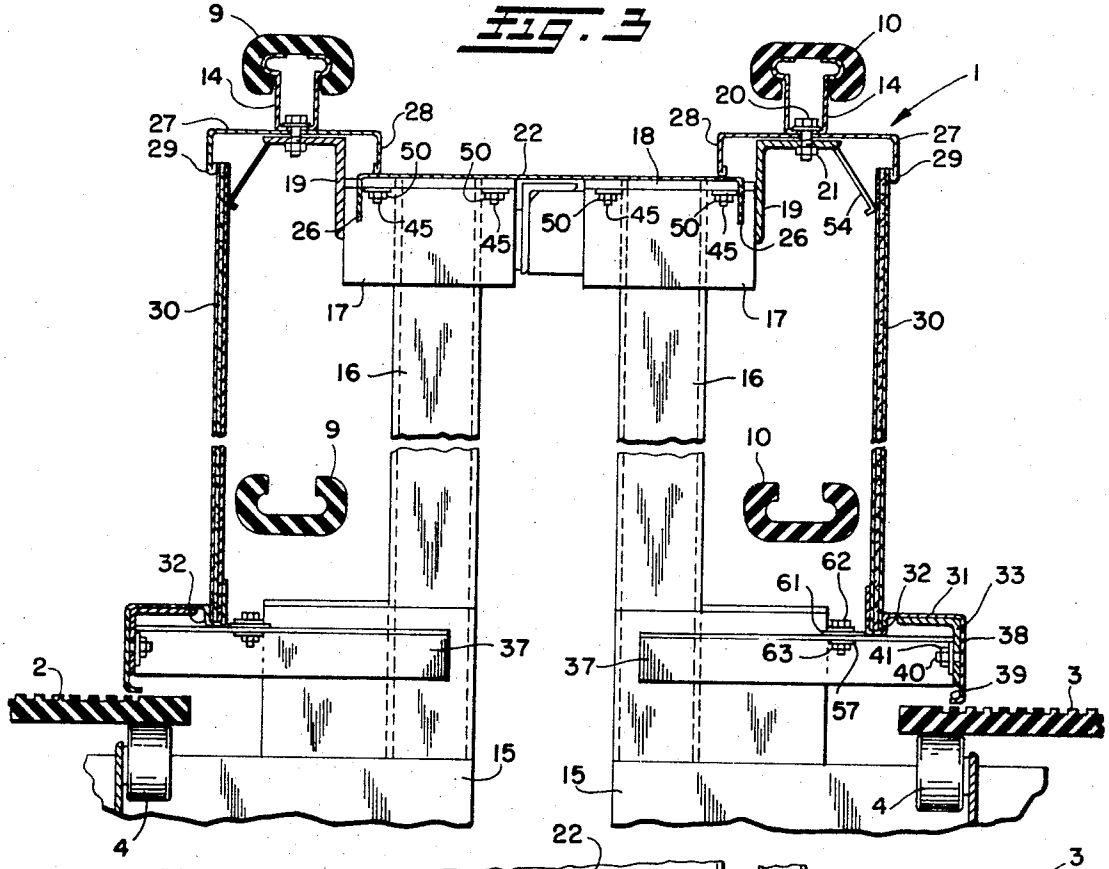
Fig. 3



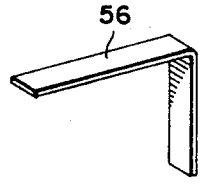




Fig. 11

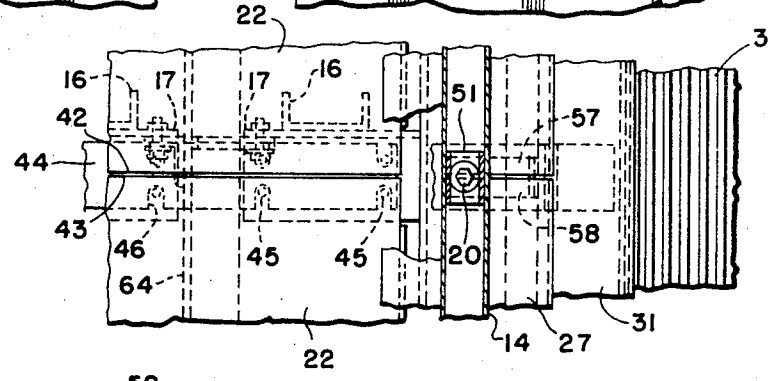



Fig. 5

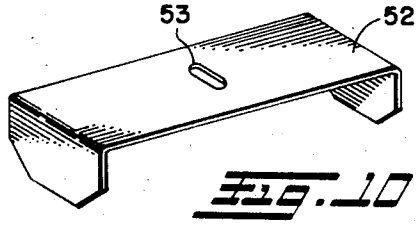



Fig. 10


Fig. 12

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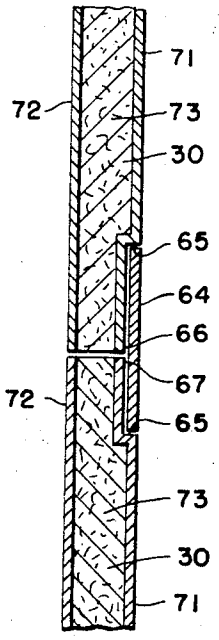


Fig. 6

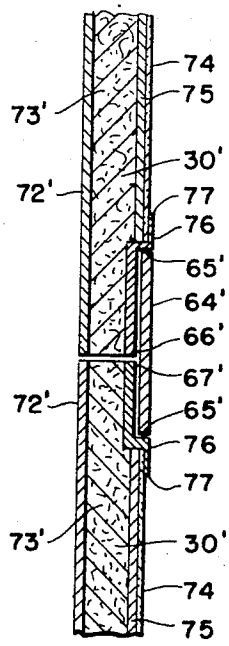


Fig. 7

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# BALUSTRADE CONSTRUCTION

This invention relates generally, as indicated, to an enclosed balustrade of the type used for passenger conveyors which is necessary to support the moving handrail and also enclose the moving parts within the balustrade.

It has been the common practice to construct balustrades with the various convering components fastened to a supporting structure by screws or other fasteners which are exposed to the outside of the balustrade for installation and removal of the components. These fasteners have presented a problem because not only are they detrimental to the appearance of the balustrade but they sometimes work loose and stick out where they catch on clothing or scratch passengers traveling on the conveyor. They are also a temptation to children and vandals who remove the fasteners and cause damage to the balustrads and the equipment inside the balustrades. This problem is aggravated by the fact that most passenger conveyors are in public places and cannot be guarded from tampering or vandalism. It has also been found with constructions used heretofore that a considerable amount of time is lost in removing the side panels for maintenance of the conveyor mechanism where a number of fasteners must be removed to remove the side panels. Additional time is lost when the panels are put back and the fasteners must again be secured to the supporting structure.

Because of the length of the balustrades, the components must be joined at spaced-apart intervals and another problem has existed because of the special parts and the exposed fasteners which have been used at these joints.

With the foregoing in mind, it is a principal object of this invention to provide a balustrade construction having no exposed fasteners and therefore a safer and better appearing design.

Another object is to provide for quick and easy removal and installation of the side panels with a tool which is not carried by the general public so that unauthorized removal is not a problem.

Still another object of the invention is to provide a construction having a minimum number of parts and in which the clearances between parts are not critical.

A still further object of this invention is to provide splices with no exposed fasteners and underlying and overlying splice members covering the joints between the spliced components.

These and other objects of the present invention may be achieved by a construction in which the side panels are retained by internal spring clips at the top and a groove at the bottom so that the side panels can be installed by inserting the top edge under a flange and lifting the panel into a groove at the bottom with the spring clips holding the top edge against the upper flange. The upper flange is part of the handrail trip member which is sandwiched between the handrail guide and the balustrade structure. Another flange of the handrail trim member holds the deck cover in position and all other fasteners extend inwardly from the covering components where they can be secured prior to installation of the side panels.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail a certain illustrative embodiment of the invention, this being indicative, however, of but one of the various ways in which the principles of the invention may be employed.



In the annexed drawings:

FIG. **1** is a schematic side elevational view of a typical modern passenger conveyor system incorporating a preferred form of balustrade construction embodying the present invention.

FIG. **2** is a schematic plan view of the balustrade shown in FIG. **1**, parts being broken away.

FIG. **3** is an enlarged fragmentary sectional view taken along the plane of line **3**—**3** of FIG. **1**.

FIG. **4** is an enlarged fragmentary sectional view taken along the plane of line **4**—**4** of FIG. **1**, parts being broken away.

FIG. **5** is a plan view taken along the plane of line **5**—**5** of FIG. **4** with parts being broken away to show the construction at the splices and the splicing members.

FIG. **6** is an enlarged fragmentary sectional view taken along the plane of line **6**—**6** of FIG. **4**.

FIG. **7** is a sectional view like FIG. **6** of a modified side panel construction.

FIGS. **8, 9, 10, 11,** and **12** are perspective views of the deck splice member, guide splice member, handrail trim splice member, toe trim splice member, and side panel splice members respectively shown in FIGS. **4** and **5**.

A balustrade structure **1** embodying the invention is shown in FIGS. **1** and **2** as applied to a typical passenger conveying system in which the double balustrade structure extends along the sides of moving belts **2** and **3**. In this application, the balustrade structure **1** is located between the moving belts **2** and **3** which may be moving in the same direction or in opposite directions; however, this invention may be utilized in a conveyor system having only one belt with single balustrade structures on either side.

The moving belts **2** and **3** have the same construction and therefore the description will be confined to the moving belt **3** which is supported on rollers **4** mounted for supporting the belt under the edges thereof. The belt **3** is guided around the ends by sheaves **5** and **6** and over take-up pulleys in the lower run, not shown. Either one of the sheaves **5** or **6** may be driven and serve as the driving sheave for the belt or another driving sheave may be supplied engaging the lower run. Suitable landing and exit platforms **7** and **8** may be provided at the ends of the moving belts.

The balustrade structure **1** supports endless handrails **9** and **10** which may be of a flexible reinforced material having a C-shaped cross section for sliding movement on a handrail guide member **14**. In view of the fact that the balustrade structure supporting handrail **9** is identical with the balustrade structure supporting handrail **10**, this description will be confined to describing the balustrade structure supporting handrail **10**.

The rollers **4** and sheaves **5** and **6** of the moving walkway system are mounted on a supporting structure made up of welded steel plates **15** or other suitable fabrication. Upright supporting members such as channels **16** are mounted on the plates **15** at spaced apart positions along the walkway and support transverse plate members **17** to which deck supporting members such as plates **18** are mounted. Handrail supporting members such as angles **19** are mounted on the transverse member **17** at each channel **16** and are fastened to the

handrail guide members 14 by bolts 20 extending downwardly through the handrail guide members and the horizontal flange of the angle so that a nut 21 may be threaded on the bolts from the inside of the balustrade structure 1. These bolts 20 and nuts 21 may be spaced longitudinally along the handrail guide members at positions where they supply sufficient rigidity to the handrail guide members 14.

A deck cover member 22 of sheet metal or other suitable material overlies the plates 18 and extends longitudinally of the balustrade structure between the handrails 9 and 10. The deck cover member 22 has a downwardly extending flange 26 along each longitudinal edge and this flange abuts the edge of the plate 18 restricting the transverse movement of the deck cover 22.

A handrail trim member 27 of sheet metal or other suitable covering material extends over the supporting angle 19 and under the handrail guide member 14 in a longitudinal direction to cover the structure beneath the handrails 9 and 10. At the longitudinal edge of the handrail trim member 27 overlapping the deck cover member 22, a deck holding flange 28 extends downwardly into engagement with the upper surface of the deck cover member for holding the deck cover member against the plate 18.

At the other longitudinal edge of the handrail trim member 27, an overlapping flange 29 extends downwardly for overlapping engagement with a side panel member 30 at the top edge of the side panel member.

At the bottom edge of the side panel member 30, a toe trim member 31 of sheet metal or other suitable covering material is shaped with a groove 32 recessed to receive the bottom edge of the side panel member and hold it in position. The toe trim member 31 extends around a supporting base member such as structural angle 33 mounted on transverse supporting plates 37 secured to the steel plates 15. The toe trim member 31 has a downwardly extending skirt portion 38 extending to a position close to belt 3 with an inwardly extending lip 39 at the edge adjacent the belt. Studs 40 which may be welded to the inner face of the skirt portion 38 at intervals longitudinally along the tie trim member extend through holes in the structural angle 33 so that nuts 41 may be threaded on the studs and clamp the toe trim member 31 against the structural angle 33.

As shown in FIGS. 1 and 2, the moving walkway system may extend over long distance; therefore, the balustrade structure must be made up of longitudinal sections fastened together along the walkway. Referring to FIGS. 4 and 5, theconnection of these sections is shown in detail. The deck cover member 22 is in sections having adjoining portions with an end edge 42 adjacent an edge 43 of an adjoining portion. A deck splice member 44, shown in FIG. 8, is positioned over the plates 18 and under the edges 42 and 43 of the adjoining portions of the deck cover member 22 covering the space between these ends. Studs 45 which are fastened to the adjoining portions close to the edges 42 and 43 as by welding, extend downwardly through slots 46 in the deck splice member 44 through the plates 18. Nuts 50 are threaded on the ends of the studs 45 for clamping the deck cover member 22 against the plates 18 with the deck splice member 44 clamped therebeween and held in position by the slots 46. As shown in the drawings, the nuts 50 may be screwed on the studs 45 from the inside of the balustrade structure 1.

At the junction of the handrail guide adjoining portions, a channel-shaped handrail guide splice member 51, shown in FIG. 9, is mounted within the handrail guide member 14 and one of the bolts 20 is inserted through the splice member 51 with the nut 21 being threaded on the bolt 20 from the inside of the balustrade to clamp the handrail ends against the angle 19.

A handrail trim splice member 52, shown in FIG. 10, also has an opening 53 through which the bolt 20 is inserted. The handrail trim splice member 52 is channel-shaped to conform with the inside surface of the handrail trim member 27 underlying the overlapping flange 29 at one side and the deck holding flange 28 at the other side and thereby filling the space between the ends of adjoining trim portions. The edges of the handrail trim splice member underlie the ends of the adjoining trim portions.

At this same connection, a yieldable spring clip 54 of spring steel is clamped between a washer 55 and the handrail trim splice member 52 by the volt 20 and nut 21 and extends downwardly and outwardly towards the side panel member 30 for engagement with the inner face of the side panel member pressing the top edge into contact with the overlapping flange 29 of the handrail trim member 27. As shown in FIGS. 3 and 4, the spring clip 54 engages the side panel member 30 at a position spaced below the edge of the flange 29 so that the panel member can be used as a lever to urge the spring clip toward the inside of the balustrade structure.

A toe trim splice member 56 shown in FIG. 11 underlies the ends of adjoining toe trim portions and overlies the structural angle base member 33 with the edges under the ends of the toe trim portions. The toe trim splice member 56 is held tightly between the ends of the adjoining toe trim portions which have extensions 57 and 58 extending horizontally from the groove 32 under a clamping bar 61 fastened to the transfer support plate 37 by a bolt 62 and nut 63 which are clamped together from the inside of the balustrade structure 1.

The side panel members 30 also have adjoining portions with vertical edges adjoining and overlapped by a side panel splice member such as strip 64, shown in FIGS. 6 and 12. The strip 64 is preferably of stainless steel and fits in a groove 65 formed by inset edges 66 and 67 of the adjoining portions with the thickness of the strip 64 being equal to the depth of the groove to provide a flush smooth surface at this joint. As shown more clearly in FIG. 6, the side panel 30 may have an outer surface plate 71 of stainless steel at the outer surface and an inner surface plate 72 of sheet steel at the inner surface with an intermediate sheet 73 of fiberboard or other suitable material sandwiched between and bonded by a suitable adhesive to the inner surface plate and outer surface plate. The strip 64 and outer surface plate 71 accordingly overlap and join to provide a smooth flush joint of attractive appearance and without any projections to injure passengers or catch their clothing. The upper end of the strip 64 is disposed under the overlapping flange 29 of the handrail trim member 27 and the lower end of the strip is in the groove 32 of the toe trim member 31 holding the strip in the groove 65 in the side panel members 30.

The side panel member construction may have different outer facing surfaces and one modification is shown in FIG. 7 where the side panel members 30' have a por-

celain facing **74** overlying a backing sheet **75** of sheet steel or other suitable material extending from the edges of the groove **65'** formed by inset edges **66'** and **67'** of the adjoining portion of the side panel members **30'**. Groove liner plates **76** of stainless steel extend from the edges **66'** and **67'** to the edges of the groove **65'** and around the edges of the porcelain facing **74** with a flange **77** overlapping the porcelain facing and protecting it from chipping and other wear. The strip **64'** of stainless steel fits in the groove **65'** and has a thickness equal to the depth of the groove. An inner surface plate **72'** of sheet steel is disposed at the inner surface and an intermediate sheet **73'** of fiberboard is sandwiched between and adhered to the inner surface plate and the backing sheet **75** to provide a unitary structure.

The balustrade structure described hereinabove has no fasteners exposed on the outside; however, access to the inside of the structure may be easily and conveniently obtained by applying a suction cup side panel holder to the side panels **30** for gripping their outer faces and by lifting the side panel and sliding its upper end closer to the handrail trim member **27.** The lower edge of the side panel is removed from the groove **32** and can be lifted away from the balustrade structure. Access then can be had to the bolts and nuts enumerated above for assembling and disassembling the various parts of the structure. The handrails **9** and **10** are removable by flexing the lips of the handrails and pulling them around the handrail guide member **14.** Handrail guide member **14** as well as the handrail trim member **27** may be removed by moving the nut **21** and lifting the bolts **20** off of the angle support **19.** With the handrail trim member **27** removed, the deck holding flange **28** may also be removed and by unscrewing the nuts **50** from the studs **45** on the ends of adjoining portions of the deck cover member **22,** the deck cover may be removed and access can be had from the top of the balustrade structure.

After the side panel member **30** has been removed, the toe trim member **31** may be removed by unscrewing the nuts **41** from studs **40** and unscrewing the nuts **63** from the bolts **62** fastening the toe trim member to the angle member **33** and transverse supporting plate **37.**

Assembly of the parts may be accomplished by reversing this process and finally lifting the side panel member **30** with the upper edge between the spring clip **54** and the overlapping flange **29** of the handrail trim member and then setting the lower edge of the side panel member in the groove **32** of the toe trim member **31.** The balustrade structure **1** in the assembled construction has no exposed fasteners and the only way to obtain access to the inside of the balustrade is by lifting the side panel **30.** This is a fairly heavy member of steel and fiberboard and the only way to lift the side panel is by use of a special tool which in the present application is a tool having vacuum cups for attachment to the surface of a side panel. When this tool is attached to the surface of the side panel **30,** it can be lifted and the lower edge swung outward to slide the upper edge out from under the overlapping flange **29** and thereby completely remove the panel from the structure. It is understood that before this is done, the side panel splicing strip **64** is removed by pushing the strip upward and then swinging the lower end of the strip out of the groove **32** at the lower edge of the side panel whereupon the strip can be pulled down and out from under the overlapping flange **29.**

With this construction, a balustrade structure is provided which is substantially tamper proof and safe in operation. Access to the inside of the balustrade to service the return run of the handrails **9** and **10** and to assemble the balustrade is quickly and conveniently provided with special tools which are not available to the public so that only authorized personnel will have access to the inside of the balustrade structure.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit or scope of the invention.

We, therefore, particularly point out and distinctly claim as our invention:

**1.** An enclosed balustrade structure comprising a top portion and parallel side portions, said top portions supporting two parallel handrails at each side and including handrail supporting members, handrail trim members overlying said handrail supporting members, handrail guide members mounted on said handrail trim members by fasteners extending through said handrail trim members and said handrail supporting members, a deck supporting member between and in side-by-side relation to said handrail supporting members, a deck cover member overlying said deck supporting member, deck-holding flanges on the opposing edges of said handrail trim members, said holding flanges extending downwardly into engagement with the upper surface of said deck cover member, overlapping flanges on the other edges of said handrail trim members extending downwardly into said side portions, said side portions having channel members at the lower edges for receiving and holding side panel members extending upwardly under said overlapping flanges and spring means mounted inside said balustrade for engagement with the inner faces of said panel members to hold said panel members against said overlapping flanges while permitting removal from said panel members by upward movement of said panel members between said holding means and said overlapping flanges and outward movement of the lower edges of said panel members.

**2.** An enclosed balustrade structure comprising a top portion and a side portion, said top portion supporting a handrail and having an overlapping flange extending downwardly into said side portion, said side portion having a channel member at the lower edge providing a groove for receiving and holding a side panel member extending upwardly under said overlapping flange and a yieldable spring member mounted inside said balustrade for engagement with the inner face of said panel member at a position spaced below the edge of said overlapping flange to bias said panel member toward said overlapping flange while permitting removal from aid channel member by upward movement of said panel member between said holding means and said overlapping flange and outward movement of the lower edge of said panel member for obtaining access to the inside of said balustrade.

**3.** A balustrade structure according to claim **2** wherein said yieldable spring member is a spring clip mounted on said top portion.

4. A balustrade structure according to claim 2 wherein said side panel member has adjoining panel portions, each having a substantially vertical edge adjoining the vertical edge of another panel portion, an elongated splice member overlying said panel portions with the ends being disposed between the outer faces of said side panel member and said channel member at the lower edge and between said overlapping flange and said side panel member at the upper edge.

5. A balustrade structure according to claim 2 wherein said side panel member has an outer surface plate, an inner surface plate and an intermediate sheet sandwiched between and adhered to said inner surface plate and said outer surface plate.

6. A balustrade structure according to claim 5 whrein said side panel member has adjoining panel portions, each having a substantially vertical edge adjoining the substantially vertical edge of an adjacent panel portion, said outer surface plate being inset at the vertical edges providing a groove and an elongated splice member in said groove with the upper end under said overlapping flange and the lower end in said groove of said channel member.

7. A balustrade structure according to claim 5 wherein said outer surface plate has a porcelain facing and said side panel member has adjoining panel portions, each having a substantially vertical edge adjoining a substantially vertical edge of an adjacent panel portions, said panel portion being inset providing a groove at the vertical edges with said porcelain facing terminating at the edges of said groove, a protective flange member overlying the face of the groove and the edges of said porcelain facing and an elongated splice member in said groove with the upper end under said overlapping flange and the lower end in said groove of said channel member.

8. An enclosed balustrade structure comprising a top portion and a side portion, said top portion including a handrail supporting member and a handrail trim member overlapping said handrail supporting member and fastened thereto, said handrail trim member having an overlapping flange extending downwardly into said side portion from one edge thereof, said side portion having a channel member at the lower edge providing a groove for receiving and holding a side panel member extending upwardly under said overlapping flange and holding means mounted inside said balustrade on said handrail supporting member for engagement with the inner face of said panel member to hold said panel member against said overlapping flange while permitting removal from said channel member by upward movement of said panel member between said holding means and said overlapping flange and outward movement of the lower edge of said panel member for obtaining access to the inside of said balustrade, said top portion including a deck supporting member in side-by-side relationship to said handrail supporting member, a deck cover member overlapping said deck supporting member and said handrail trim member having a downwardly extending deck holding flange at the opposite edge from said overlapping flange for engagement with the top surface of said deck cover member to hold it in place.

9. A balustrade structure according to claim 8 wherein said deck cover member has a downwardly extending flange along a longitudinal edge overhanging an edge of said deck supporting member to confine transverse movements of said deck cover member.

10. A balustrade strucutre according to claim 8 wherein upright supporting members are mounted at spaced-apart positions longitudinally of the balustrade and are in supporting engagement with said deck supporting member and said handrail supporting member.

11. A balustrade structure according to claim 10 wherein said deck cover member has adjoining deck portions, each having an end joining an end of another deck portion at a plate member supported by one of said upright supporting members, a splice member positioned over said plate member and under the ends of said deck cover member, fasteners on the underside of said ends of said adjoining deck portions extending through slots in said splice member and through holes in said plate member and means for securing said fasteners against said plate members from inside the balustrade.

12. An enclosed balustrade structure comprising a top portion and a side portion, said top portion supporting a handrail and having an overlapping flange extending downwardly into said side portion, said side portion having a channel member at the lower edge which is part of a toe trim member extending longitudinally of the balustrade and having a grooved upper face and a skirt portion extending downwardly to a passenger carrying surface adjacent and underlying the balustrade, said grooved upper face providing a groove for receiving and holding a side panel member extending upwardly under said overlapping flange and holding means mounted inside said balustrade for engagement with the inner face of said panel member to hold said panel member against said overlapping flange while permitting removal from said grooved upper face by upward movement of said panel member between said holding means and said overlapping flange and outward movement of the lower edge of said panel member for obtaining access to the inside of said balustrade.

13. A balustrade structure according to claim 12 wherein said structure further comprises a base member extending longitudinally of said balustrade and supporting said toe trim member, fasteners at spaced-apart positions longitudinally of the balustrade on the inner face of said toe trim member extending through said base member and secured from inside the balustrade.

14. A balustrade structure according to claim 13 wherein said toe trim member has adjoining toe trim portions, each having an end joining an end of another toe trim portion, a toe trim splice member overlying said base member and with edges under the ends of said toe trim portions holding said toe trim splice member in position.

15. An enclosed balustrade structure comprising a top portion and a side portion, said top portion including a handrail supporting member and a handrail trim member overlapping said handrail supporting member and fastened thereto, said handrail trim member having an overlapping flange extending downwardly from one edge thereof into said side portion, said side portion having a channel member at the lower edge providing a groove for receiving and holding a side panel member extending upwardly under said overlapping flange and holding means mounted inside said balustrade and on said handrail supporting member for engagement with the inner face of said panel member to hold said panel member against said overlapping flange while permit-

ting removal from said channel member by upward movement of said panel member between said holding means and said overlapping flange and outward movement of the lower edge of said panel member for obtaining access to the inside of said balustrade, said handrail trim having adjoining trim portion, each having an end joining an end of another trim portion at a position intermediate the ends of the balustrade, a channel-shaped splice member overlapping said handrail supporting member and underlying the ends of said adjoining trim portion, a fastener extending through said channel-shaped splice member and said supporting member and means to secure said fastener from inside said balustrade.

**16.** An enclosed balustrade structure comprising a top portion and a side portion, said top portion including a handrail supporting member and a handrail trim member overlapping said handrail supporting member and fastened thereto, said handrail trim member havin an overlapping flange extending downwardly from one edge thereof into said side portion, said side portion having a channel member at the lower edge providing a groove for receiving and holding a side panel member extending upwardly under said overlapping flange and holding means mounted inside said balustrade on said handrail supporting member for engagement with the inner face of said panel member to hold said panel member against said overlapping flange while permitting removal from said channel member by upward movement of said panel member between said holding means and said overlapping flange and outward movement of the lower edge of said panel member for obtaining access to the inside of said balustrade, a handrail guide member for supporting the handrail mounted on said handrail supporting member with said handrail trim member sandwiched between said guide member and said supporting member, said handrail guide member having adjoining guide portions, each having an end joining an end of another guide portion, a channel-shaped splice member within said handrail guide member extending between the ends of said guide portions and a fastener extending through said guide rail splice member and through said supporting member and means to secure said fastener within the balustrade.

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# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,744,761 Dated July 10, 1973

Inventor(s) R A Chervenic, G M Glaser, J H Hewitt, E D Johnson, R K Rothrock

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the abstract, line 8, "sprlng" should read --spring--.

Column 1, line 8, "convering" should read --covering--;

line 18, "balustrads" should read --balustrades--.

Column 4, line 20, "volt" should read --bolt--.

Column 6, line 61, "aid" should read --said--.

Column 7, line 4, after "the" insert --substantially--;

line 29, "portions" should read --portion--;

after "panel", portion should read --portions--.

Column 9, line 19, "havin" should read --having--.

Signed and sealed this 8th day of January 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents