May 18, 1937. G. E. FIEDLER 2,080,980

MOVING STAIRWAY HANDRAIL PROTECTIVE DEVICE

Filed Oct. 28, 1935

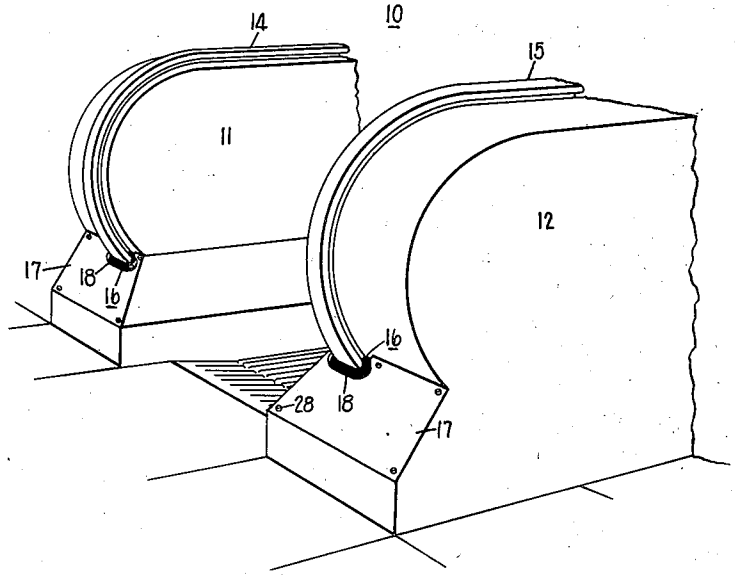


FIG. 1

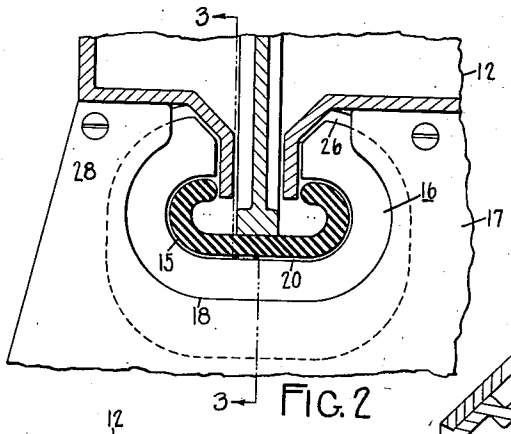


FIG. 2

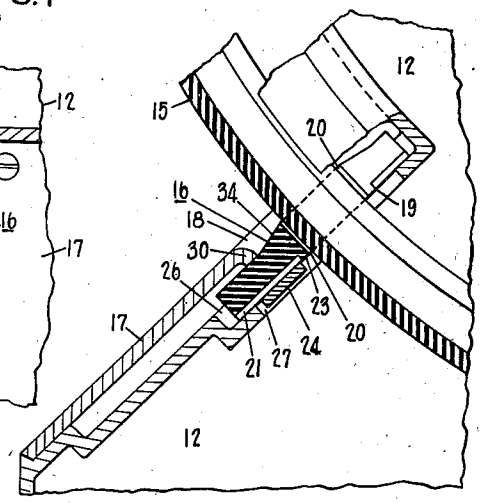


FIG. 3

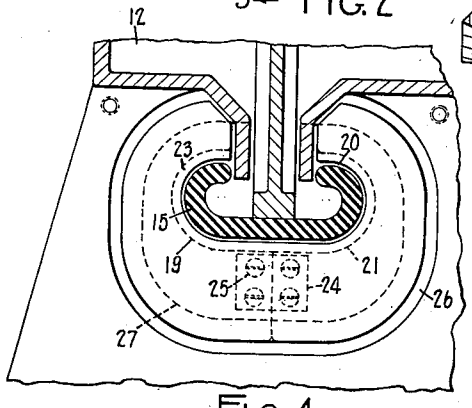


FIG. 4

George Everett Fiedler INVENTOR

BY Wallace S. Bradley ATTORNEY

Patented May 18, 1937 2,080,980

UNITED STATES PATENT OFFICE

2,080,980

MOVING STAIRWAY HANDRAIL PROTECTIVE DEVICE

George Everett Fiedler, Bloomfield, N. J., assignor to Otis Elevator Company, New York, N. Y., a corporation of New Jersey

Application October 28, 1935, Serial No. 47,059

6 Claims. (Cl. 198—16)

This invention relates to protective devices for the handrails of moving stairways.

In a moving stairway installation, the handrails are usually carried by pulleys around the ends of the balustrades at the landings, where openings are provided in the balustrades from which the handrails emerge and into which they disappear. Several expedients have been employed to prevent the fingers or hands of passengers from being caught between the balustrade and the handrail at the point where the handrail enters the balustrade. These have involved considerable expense and have presented a poor appearance.

It is the object of this invention to provide at the openings in the balustrade through which the handrail passes an arrangement that will permit free running movement of the handrails and that at the same time will prevent injuries to passengers due to having their fingers or hands caught and damage to the moving stairway due to attempts to insert canes or umbrellas into the space between the balustrade and the handrail.

In carrying out the invention, a guard of deformable elastic material and conforming to the contour of the handrail is positioned in the handrail opening, a slight clearance being provided between the outside of the handrail and the guard. Inward movement of the guard is prevented, any pressure on the outer surface acting to deform the guard so that the clearance between the handrail and the guard is reduced or taken up completely at the place where the pressure is applied.

The features and advantages of the invention will become apparent from the specification and appended claims.

In the drawing:—

Figure 1 is a view in perspective of a portion of a moving stairway showing the balustrades equipped with protective means in accordance with the present invention;

Figure 2 is a plan view of a portion of a balustrade at the handrail opening;

Figure 3 is a section taken along line 3—3 of Figure 2; and

Figure 4 is a view similar to Figure 2, with the balustrade end cover removed.

Referring to Figure 1, the balustrades of the moving stairway 10 are designated 11 and 12. The handrails 14 and 15 are carried by pulleys around the ends of the stairway through openings provided in the ends of the balustrades. Guards 16 are positioned in the openings beneath cover plates 17, the cover plates being provided with openings 18 to receive the handrails. The cover plates are secured to the balustrades by means of screws 28. As the construction for each balustrade is identical, only that for balustrade 12 will be described in detail.

Referring to Figures 2, 3, and 4, a C-shaped handrail 15 is illustrated. According to the preferred construction, guard 16 is in the form of a collar of flexible rubber having an opening 20 of the contour of the handrail. The size of the opening is such as to provide a slight clearance, say one-sixteenth of an inch, between the guard and the handrail. The exposed surface 34 of the guard is preferably bevelled as shown in Figure 3. A backing plate 21 is provided for the guard. This plate also is formed with an opening 19 of the contour of the handrail and of a size to permit a bead 23 formed on guard 16 to extend between the handrail and the plate. This prevents the edge of the plate contacting with the handrail and also serves to locate guard 16 in position with respect to the plate 21. The guard is sprung around the handrail, while the plate is formed of two symmetrical parts which are joined together after assembly around the handrail by clip 24 and screws 25. At the opening 27 through which the handrail passes, the balustrade is provided with a pocket 26. The guard and its backing plate are securely clamped in this pocket in proper position with respect to the handrail by cover plate 17. The cover plate is formed with a shoulder 30 around opening 18, and this shoulder engages guard 16 to hold it in position. Before the guard 16 is finally secured in place the handrail is operated with the cover plate removed until a complete run has passed through the guard. During this run, the guard is adjusted to obtain a mean clearance for the entire run of the handrail. The cover plate is then secured to the balustrade, which clamps the guard in its proper position.

In operation, assume that a person, such as a small child, holds his hand on the handrail until the handrail reaches the point at which it disappears into the balustrading. The opening 18 in cover plate 17 is large enough to permit the hand to butt against guard 16 without being pinched between the cover plate and the handrail. The pressure of the hand at the point or points where it engages guard 16 deforms the guard and, in view of the fact that backing plate 21 prevents a bodily deflection of the guard, the result is a closing up of the small clearance between the handrail and the guard. Thus the person is forced to release his grip from the handrail and

cannot be injured by having his fingers pinched. Furthermore, the guard effectually prevents the insertion of articles such as canes or umbrellas into the balustrading. If desired, the guard 16 may be mounted so that, instead of being clamped tightly, it is permitted to move to adjust itself to irregularities as operation of the handrail takes place.

From the above it will be seen that the invention involves the provision of a guard for the handrail opening in a balustrade which fits around the handrail with a small clearance, which is of a material and arranged so that the application of pressure to the exposed surface thereof causes the clearance to be decreased at the point where the pressure is applied, and which does not injure the handrail upon the handrail coming in contact therewith.

What is claimed is:

1. A protective device for a moving stairway handrail opening comprising, a guard of deformable elastic material fitting around the handrail with a small clearance, means for preventing bodily deflection of said guard, and means for securing said guard and said deflection preventing means in place in said opening.

2. A protective device for a handrail opening in a balustrade of a moving stairway comprising, yieldable elastic means in said opening fitting around the handrail with a small clearance, and a backing plate behind said yieldable elastic means to limit rearward deflection thereof.

3. A protective device for a handrail opening in a balustrade of a moving stairway comprising, a guard of rubber having an opening therein conforming to the contour of the handrail, said opening being of a size to provide a small clearance between the handrail and the guard, a backing plate for said guard having an opening therein conforming to the contour of the handrail, and means for securing said guard and said backing plate to said balustrade in said opening in position with respect to the handrail.

4. A protective device for a handrail opening in a balustrade of a moving stairway comprising, a guard of flexible rubber having an opening therein conforming to the contour of the handrail so as to fit around the handrail, said opening being of a size to provide a small clearance between the handrail and the guard, a rigid backing plate for said guard, said plate having an opening therein conforming to the contour of the handrail so as to fit around the handrail, said opening in said plate being larger than that in said guard, a cover plate, and means for securing said cover plate to said balustrade to clamp said guard and backing plate in said balustrade opening against the balustrade in position with respect to the handrail.

5. A protective device for a handrail opening in a balustrade of a moving stairway comprising, a guard of flexible rubber having an opening therein conforming to the contour of the handrail so as to fit around the handrail, said opening being of a size to provide a small clearance between the handrail and the guard, a rigid backing plate for said guard, said plate having an opening therein conforming to the contour of the handrail so as to fit around the handrail, said opening in said plate being larger than that in said guard, a cover plate having an opening for said handrail, said opening in the cover plate being larger than the opening in said guard so as to expose a considerable portion of the surface of said guard around the handrail, and means for securing said cover plate to said balustrade to clamp said guard and backing plate in said balustrade opening against the balustrade in position with respect to the handrail.

6. A protective device for a handrail opening in a balustrade of a moving stairway comprising, a guard of flexible rubber having an opening therein conforming to the contour of the handrail so as to fit around the handrail, said opening being of a size to provide a small clearance between the handrail and the guard, a rigid backing plate for said guard with two secured together parts, said plate having an opening therein conforming to the contour of the handrail so as to fit around the handrail, said opening in said plate being larger than that in said guard, said guard being formed with a bead extending between the edge of the plate and the handrail, a cover plate, and means for securing said cover plate to said balustrade to clamp said guard and backing plate in said balustrade opening against the balustrade in position with respect to the handrail.

GEORGE EVERETT FIEDLER.