April 11, 1961 L. V. COLE 2,979,180

HAND RAILS FOR MOVING STAIRS

Filed March 16, 1959 2 Sheets-Sheet 1

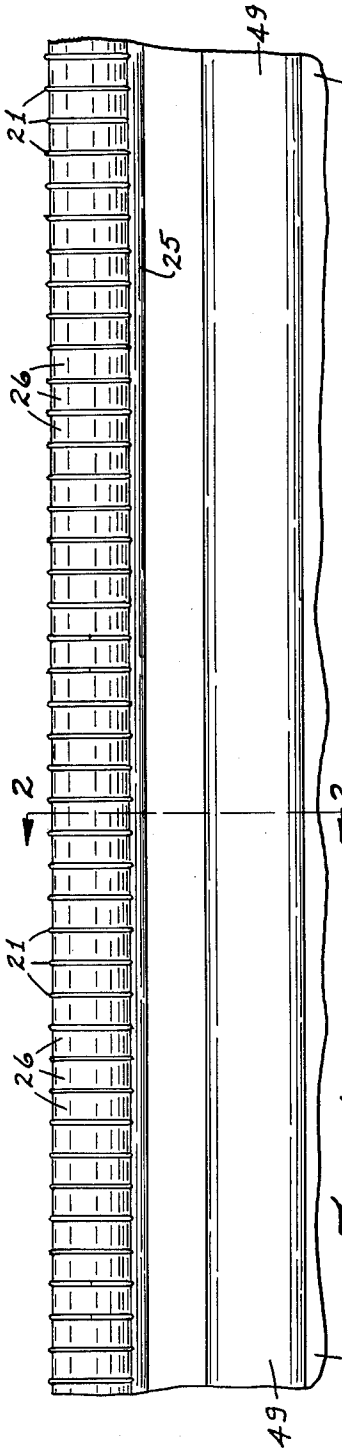


FIG. 1.

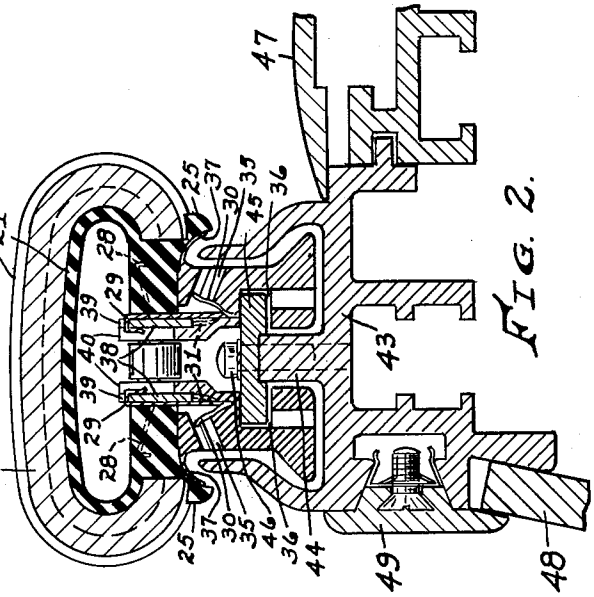


FIG. 2.

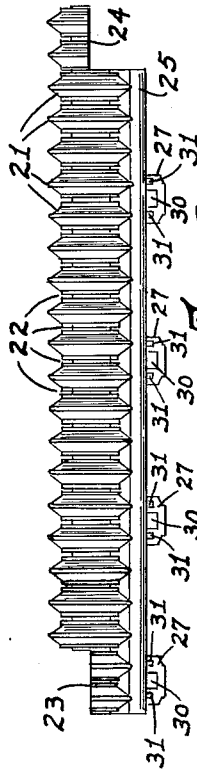


FIG. 3.

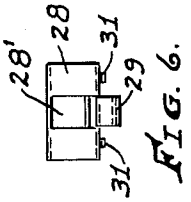


FIG. 6.

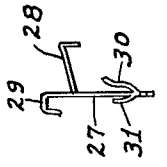


FIG. 5.

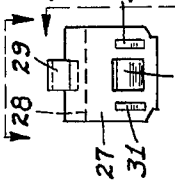


FIG. 4.

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HAND RAILS FOR MOVING STAIRS

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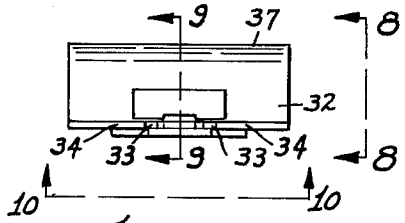


FIG. 7.

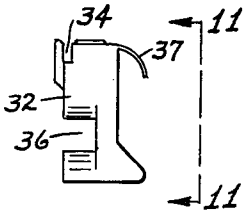


FIG. 8.

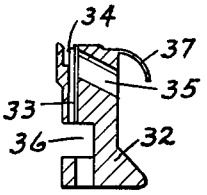


FIG. 9.

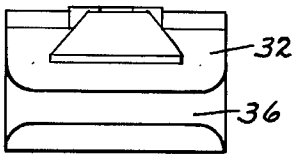


FIG. 10.

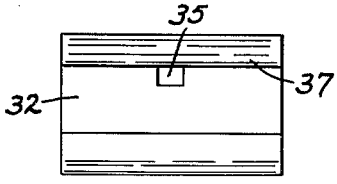


FIG. 11.

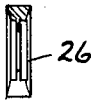


FIG. 16.

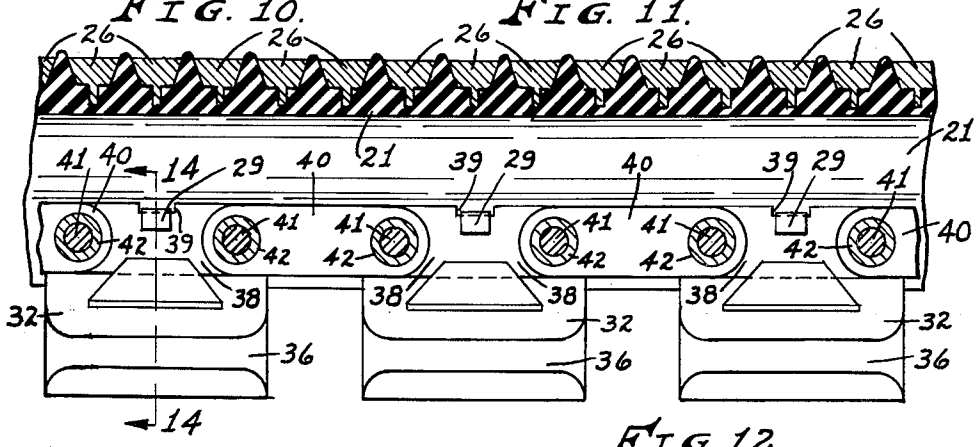


FIG. 12.

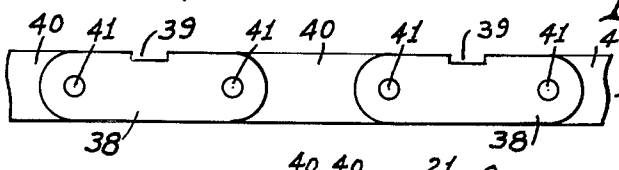


FIG. 13.

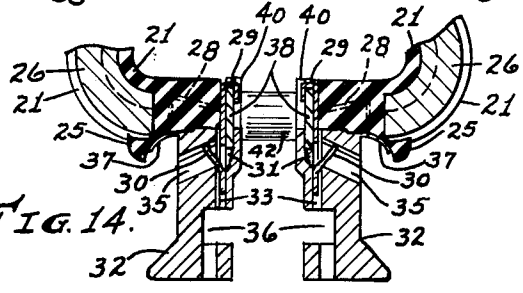


FIG. 14.

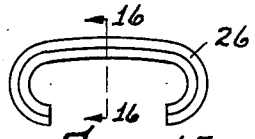


FIG. 15.

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United States Patent Office 2,979,180 Patented Apr. 11, 1961

2,979,180

HAND RAILS FOR MOVING STAIRS

Leo V. Cole, Richmond, Ind., assignor to The Peelle Company, Brooklyn, N.Y., a corporation of New York

Filed Mar. 16, 1959, Ser. No. 799,799

2 Claims. (Cl. 198—16)

The present invention relates specifically to hand rails used in combination with and forming a part of moving stairs. The hand rails are secured to continuous chains which travel in orbit about sprockets provided therefor and in unison with the movement of the steps of the stair.

The invention pertains specifically to means providing for more quiet operation of the hand rails and further to reduce wear on the parts comprising the same.

The principal object of the invention resides in the new and novel means of securing the hand rail to its driving chain.

A second object is the provision of means removably securing shoes of low frictional properties to the driving chain and to the hand rail.

Another object is the provision of means forming a part of the hand rail construction permitting the hand rail to ride smoothly and without friction with relation to the trim of the stair.

Further objects and particular advantages of the invention will become more apparent in the course of the following description, and that which is new will be pointed out in the appended claims.

The most satisfactory, and presently preferred manner of accomplishing the objects of the invention is illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a portion of a moving stair hand rail, with the same embodying the features of the invention.

Figure 2 is a detail section through the hand rail and its track, with the same being taken on line 2—2 of Figure 1.

Figure 3 is a detail side elevation of one section of the hand rail.

Figure 4 is a detail elevation of one of the clips, by means of which the hand rail sections are secured to the hand rail driving chain.

Figure 5 is an end elevation of the clip, taken from line 5—5 of Figure 4.

Figure 6 is a top plan view of the clip, taken from line 6—6 of Figure 4.

Figure 7 is a top plan view of a shoe member forming a portion of the invention.

Figure 8 is an end elevation of the shoe member, taken from line 8—8 of Figure 7.

Figure 9 is a detail section through the shoe member, taken on line 9—9 of Figure 7.

Figure 10 is a side elevation of the shoe member, taken from line 10—10 of Figure 7.

Figure 11 is a detail side elevation of the shoe member showing the opposite side thereof with relation to that shown in Figure 10, and as taken from line 11—11 of Figure 8.

Figure 12 is a detail longitudinal section through the hand rail assembly, including the drive chain thereof.

Figure 13 is a detail elevation of a portion of the hand rail drive chain, with the same showing the notches

formed therein for the reception of the clips shown in Figure 4.

Figure 14 is a detail section through a portion of the hand rail, as taken on line 14—14 of Figure 12.

Figure 15 is a detail elevation of one of the bracelet members used in and being a part of the hand rail assembly.

Figure 16 is a detail section-elevation through the bracelet member, taken on line 16—16 of Figure 15.

Like characters of reference designate like parts throughout the several views of the drawings.

In order that the construction of the hand rail and the elements thereof may be more fully understood and appreciated, I will now take up a detailed description thereof in which the same will be more fully and comprehensively set forth.

Referring now to the drawings in detail, numerals 21 designate the hand rail bellows members of which the hand rail is primarily composed, with there being a continuous series of channels 22 formed in the outer surface thereof. The bellows are formed in predetermined lengths with each of the lengths having a portion 23 and a portion 24 formed at the ends thereof, and with the portion 23 of each length being adapted to register with a companion portion 24 of the adjacent length of hand rail 21. The hand rail members 21 are preferably formed, by the molding process, of rubber or a suitable composition having sufficient flexibility to travel, in their orbits, around the hand rail chain sprockets located at the upper and the lower ends of the stairs. The lower or inner edge 25 of the hand rail members are formed integrally with the members and form a bead thereon, with the same being adapted to lap and conceal certain parts of the hand rail trim from view and protecting the same from the insertion of objects thereinto by the stair passengers. Each of the channels formed in the outer surface of the members 21 is adapted to receive a bracelet 26, with the outer surfaces of the bracelets being slightly below the peaks of the channels as shown in Figure 1, and with the peaks providing a substantial non-slip gripping surface for passengers.

In the molding of the hand rail sections 21, clip members 27 are interposed at spaced intervals in the length of the section. Each of the clips has an anchor portion 28 formed thereon which is enveloped by the material forming the sections 21 and with the same becoming embedded therein. A chain link-engaging portion 29 is formed on each of the clips by punching out a portion of the anchor 28 and leaving a void 28' therein, and through which the material forming the sections 21 bonds and thereby providing further anchoring of the clips into the sections 21. The clip further has a shoe-engaging wing 30 formed thereon, the purpose of which will be more fully set forth hereinafter. Each of the clips 27 also has a pair of fingers 31 formed thereon with these fingers being formed on the opposite side of the clip from the wing 30, and with the function of the fingers 31 also being set forth more fully hereinafter.

Shoes 32 are provided to be attached to the lower portion of the clips 27, with there being a clip-receiving slot 33 formed vertically therein. A chain-receiving channel 34 is formed longitudinally of the shoe along the upper edge thereof, with there being an angularly-disposed aperture 35 formed through the body of the shoe for the reception of wing 30 of clip 27. A track-receiving channel 36 is formed along one side of the shoe and extending longitudinally thereof, as more clearly shown in Figures 8, 9 and 10. A curved flange 37 is formed integrally with the upper surface of the shoe to coincide with the curved inner surface of lower edge 25 of the bellows members.

The hand rail driving chain is shown in Figure 13

with there being alternate links **38** and **40** connected by the usual pins **41**. It will be noted that links **38** each has a notch **39** formed in the upper edge thereof for the reception of the link-engaging portion **29** of the clips **27**. Numerals **42** designate the usual rollers of the chain.

Numerals **43** designate the stair balustrade which is provided with an upstanding stem **44** onto which the track **45** is secured by means of screws **46**. **47** designates a portion of the deck trim of the stair while **48** designates a panel member located adjacent the moving steps and being secured in position by means of molding member **49**, as shown in Figure 2.

In the assembly of the hand rail, the bracelets **26** are engaged in the channels **22** of the bellows members, with the bracelets located at the joints formed by portions **23** and **24** tying the adjacent and overlapping ends of the bellows members together. The clips **27** project downwardly from the bellows **21**. The hand rail drive chain is brought into position with the clips **27**, with the link-engaging portions of the clips registering with and seating in the notches **39** of the chain links. With the chain and clips being positioned together, the shoes **32** are pressed onto the clips with the fingers **31** frictionally engaging the clip-receiving slots **33** of the shoes and at the same time the ends of fingers **31** engage the lower edges of the chain links **38** preventing clip **29** from becoming disengaged from slot **39** in the chain due to the force required to push shoes **32** onto the clips **27**. As the shoe is pressed further onto the clip, the bottom surface of the chain-receiving channel of the shoe seats against the bottom edges of the respective chain links **38** and, at the same time, the wing **30** of the clip springs into the angularly-disposed aperture **35** of the shoe and thereby locks the shoe into position, as shown in Figures 2, 12 and 14.

The hand rail is positioned onto track **45** by longitudinal movement of the hand rail over a free end of the track member.

It will be noted, by referring to Figure 2, that the chain does not ride or lie on the track **45**. The only members of the hand rail construction coming into contact with the track **45** are the track-receiving channels **36** of the shoes. With the shoes being formed of special friction-resisting material, the movement of the hand rail with relation to the track requires less motive power and provides for more quiet operation of the hand rail.

I desire that, while the presently preferred construction is shown and described, minor changes may be made in the parts and the assembly thereof, insofar as the changes therein may fall within the scope of the appended claims in their broadest form.

Having now shown and described the invention, what I claim and desire to secure by Letters Patent of the United States is:

1. In a hand rail for moving stairs, a hand rail drive chain adapted to run over spaced-apart sprockets provided therefor with a hand rail track being located in close proximity with relation to the hand rail drive chain, a series of bellows members secured together in end-to-end relation and carried in an orbit about the spaced-apart sprockets by means of the hand rail drive chain, said bellows being provided with a plurality of clip members secured in engagement with the hand rail drive chain, a shoe member fitted onto each of the clips with each of the shoes having a track-receiving channel formed therein, and with the hand rail being sustained in spaced relation with the track throughout its orbit by means of the track-receiving channels of the shoes engaging the track.

2. A hand rail as set forth in claim 1, and with bracelet members engaging the bellows members and providing means of maintaining the bellows members in their end-to-end relation.

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