March 12, 1940. J. DUNLOP 2,193,583

MOVING STAIRWAY

Filed Jan. 4, 1939

Fig. 1.

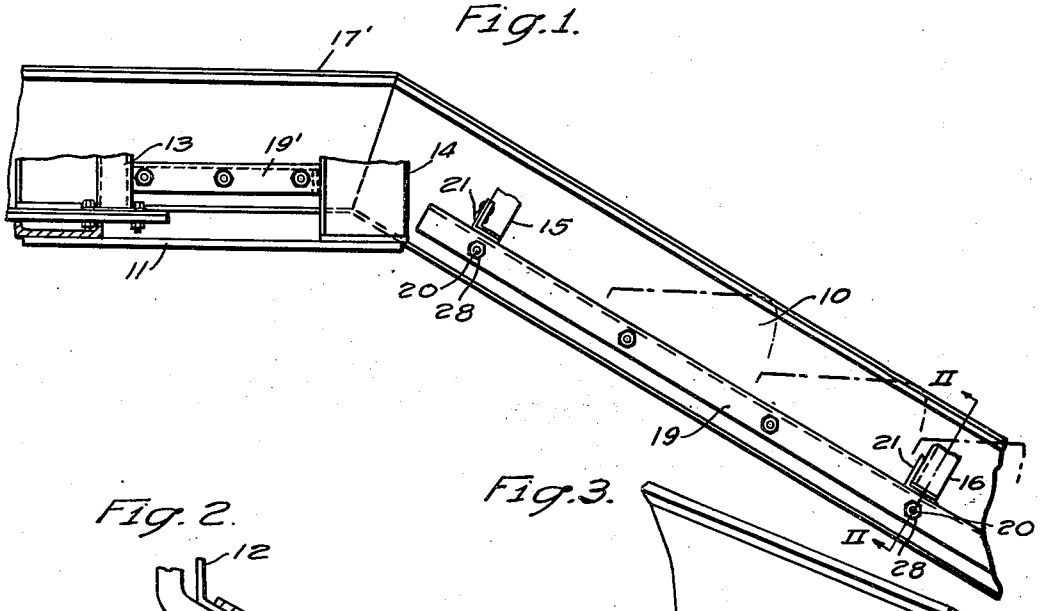


Fig. 2.

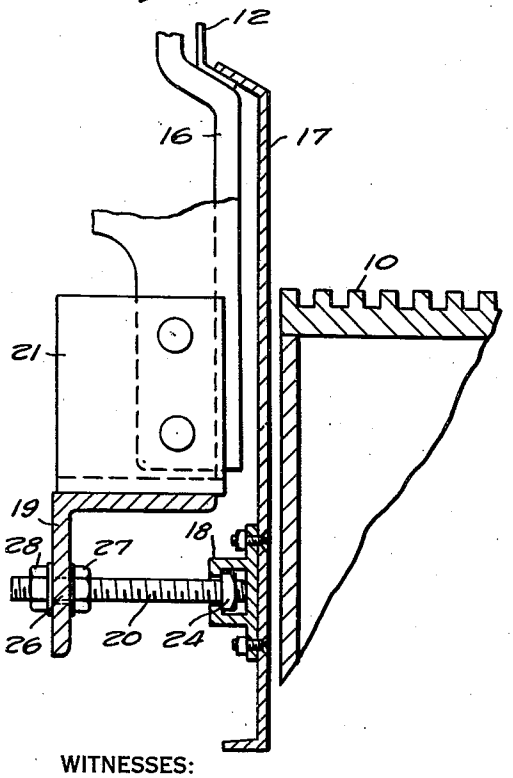
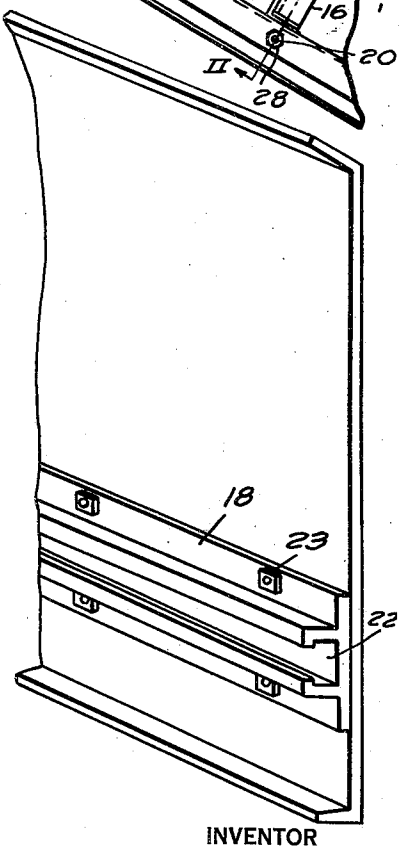


Fig. 3.



WITNESSES:

E. A. McCloskey.

Birney Hines

INVENTOR

James Dunlop.

BY

ATTORNEY

Patented Mar. 12, 1940

2,193,583

UNITED STATES PATENT OFFICE

2,193,583

MOVING STAIRWAY

James Dunlop, Ridgewood, N. J., assignor to Westinghouse Electric Elevator Company, Jersey City, N. J., a corporation of Illinois

Application January 4, 1939, Serial No. 249,204

8 Claims. (Cl. 198—16)

My invention relates to moving stairways, and more particularly to the balustrading provided for the sides of such stairways.

In constructing moving stairways leading from a lower landing to an upper landing, considerable difficulty has always been encountered in setting up the balustrading for the stairway steps, particularly in mounting the lower panel or skirt on the balustrading in correct position with relation to the sides of the steps. If the opening between the balustrading skirt and the sides of the stair runway is too wide, dirt and small objects are liable to get between the skirt and the moving steps and cause trouble. Also, if the opening is too wide, the passengers on the steps may get the ends of their canes or unbrellas caught in the opening, and, in extreme cases, even parts of a passenger's shoe may be caught between the skirt and the steps, resulting in danger for the passenger and trouble in operating the steps.

On the contrary, if the opening between the steps and skirt is too small, the steps may after being operated a while wear in such manner as to impinge against the skirt, with resulting noise and difficulty in operation. Heretofore, the matter of correctly adjusting the position of the skirt with reference to the steps has been effected by the use of shims between the frame and the skirt. The use of shims makes it difficult to assemble the balustrading and the skirt in correct position adjacent to the steps and also makes it difficult to readjust the position of the skirt. These difficulties arise because in preparing the balustrading and the frame, it is necessary to have all the bolt holes accurately placed in the various parts so they will line up correctly when the balustrading and skirt are assembled. Furthermore, the shims are difficult to handle and keep in place while the bolts are being loosened and tightened here and there as the parts are assembled and adjusted.

Therefore it is an object of my invention to provide a balustrading construction by means of which the balustrading skirt may be set up in its correct position with reference to the steps in a short time with a minimum amount of effort, and by means of which the skirt may be quickly and easily readjusted to its correct position whenever it is found that the steps are moving along a line too close or too far away from the skirt.

Another object is to provide a balustrading for moving stairways in which the skirt for the balustrading may be conducted of thinner lighter material than heretofore possible.

A further object is to provide fastening means for the skirts of balustrading in moving stairways which lends itself better to supporting curved skirt portions than does the fastening means heretofore utilized.

It is also an object to provide a balustrading which shall require a minimum amount of engineering and fabrication in preparation for installation and which shall be low in cost and easily maintained in operation.

For a better understanding of the invention, reference may be had to the accompanying drawing, in which:

Figure 1 is an illustration in side elevation of a series of moving steps provided with balustrading constructed in accordance with my invention.

Fig. 2 is a view taken along the line II—II of Fig. 1, with a small portion of the upper balustrading for a stairway added thereto; and

Fig. 3 is a view in perspective of the balustrading skirt shown in Figs. 1 and 2.

Referring more particularly to the drawing, I have illustrated a moving stairway as embodying an endless series of moving steps 10 disposed to operate between an upper landing 11 and a lower landing (not shown). The stairway steps may be provided with balustrading panels 12, only a small portion of one of which is shown in Fig. 2. The balustrading panels may be supported upon a balustrading frame in the usual manner, as represented by the balustrading brackets 13, 14, 15 and 16. The frames including brackets of this nature are old and well known in the moving stairway art and may be attached to the stairway truss (not shown) or be supported in any suitable manner to provide a longitudinal frame for the balustrading.

A balustrading skirt panel 17 is provided to extend along the side of the moving steps to protect them from injury and to close the opening between the balustrading frame and the sides of the steps.

I have provided a novel means for adjustably supporting the skirt 17 on the balustrading framework comprising a slot bar 18 mounted on the inner face of the skirt, a longitudinal bar 19 mounted on the framework, and a plurality of push and pull bolts 20 for adjustably connecting the skirt to the longitudinal bar.

The bar 18 is preferably of extruded non-ferrous metal and is provided with an outwardly opening longitudinal T slot 22. The extruded bar may be secured to the inner face of the skirt in any suitable manner, as by a plurality of machine bolts 23, so that it becomes practically a

part of the skirt. The T slot in the bar extends longitudinally of the bar and is of sufficient size to receive a plurality of internally screw-threaded nuts 24. It will be apparent from this construction that the bar 18 not only acts as a fastening means, but also acts as a stiffner for the skirt, thus permitting the use of thinner material in the skirt than heretofore practicable. It will also be evident that the extruded bar 18 lends itself readily to supporting curved skirt surfaces than does other fastening means as the bar can be prebent to the desired radius and the skirt material can be fastened to it and the assembly installed in a more efficient way than formerly.

The longitudinal bar 19 is shown as an angle iron and is secured to the balustrading frame by welding its upper surface to a plurality of angle iron clips 21 which are in turn, welded to the balustrading brackets 15 and 16. In the level portion of the stairway at the landing 11, the corresponding longitudinal bar or angle iron 19' is secured in position by welding its ends to the sides of the brackets 13 and 14.

The lower depending flange of the bar 19 is provided with a series of holes or apertures 26 which extend transversely of the flange and are spaced apart along the line of the flange corresponding to the line of movement of the stairway steps. These holes may be spaced any suitable distance apart. In practice, it has been found that a suitable construction is secured by placing the holes about four feet apart.

The screw-threaded stud bolts 20 extend from the nuts 24 in the T slot 22 through the apertures 26 in the flange of the longitudinal bar 19 and are retained in any desired position by a nut 27 on the inner face of the flange and a nut 28 on the outer face of the flange.

In erecting the skirt, a plurality of the nuts 24 are placed in the slot 22; then one of the screw-threaded stud bolts 20 is screwed into each of the nuts 24 a suitable distance. Next the nuts 27 are placed on the other ends of the stud bolts which are then moved along the skirt until they can be easily disposed in the longitudinal bar 19. When each of the nuts 24 is properly located in the slot 22 with reference to the holes 26, the bolt is tightened in the nut 24 so that its end impinges against the inner surface of the T slot and thereby holds the bolt, nut and skirt in firm position with reference to each other. After the bolts 20 are disposed through the holes 26, the nuts 28 are placed on their free ends to hold the parts in place.

If the skirt is too close to the side of the moving steps 10, the nuts 27 are loosened and the bolts 20 are moved to the left (Fig. 2) until the skirt is the correct distance away from the steps. Then the nuts 28 are tightened against the bar 18 to hold the skirt 17 firmly in the position to which it has been adjusted. If the skirt is too far away from the steps, the nuts 28 are loosened, the skirt is moved outwardly until in its correct position, and then the nuts 27 and 28 are tightened to hold it there,

If it is found after the stairway has been in operation for some time, that the steps 10 are moving too close to or too far away from the balustrade skirt, so that crevice between them is either too narrow or too wide, the position of the skirt may be easily readjusted by loosening the nuts 27 and 28 on the bolts 20, moving the skirt to the correct position with reference to the steps, and then tightening the nuts 27 and 28 against the bar 19 to hold the skirt in its correct position.

The balustrading skirt 17' at the upper landing 11 may be easily mounted and adjusted on the longitudinal bar 19' in the same manner as the skirt along the inclined portion of the stairway.

By the foregoing construction, it will be seen that I have provided a novel construction by means of which the balustrading skirt of a moving stairway may be quickly and easily constructed, assembled and adjusted with a small degree of original layout work and without the use of shims and a large amount of labor in erecting and maintaining the skirt in correct position during the life of operation of the stairway.

Although I have illustrated and described only one embodiment of my invention, it is to be understood that modifications thereof and changes therein may be made without departing from the spirit and scope of the invention.

I claim as my invention:

1. A moving stairway having an endless series of moving steps and a balustrading for one side of the steps comprising a longitudinal frame disposed in line with the moving steps and having a transverse aperture, a longitudinal skirt panel disposed between the frame and the steps, said skirt being provided with a longitudinal slot on its frame side, a bolt having its one end adjustably secured in said slot and its other end disposed in said aperture, and means for fixing the end of the bolt in the aperture and for moving it longitudinally at any time to any other position and fixing it in such position to maintain the skirt in correct position with reference to the steps.

2. In a moving stairway having an endless series of moving steps, a balustrading for one side of the steps comprising a longitudinal frame disposed in line with the moving steps, said frame being provided with a transverse aperture, a longitudinal skirt panel disposed between the frame and the steps, said skirt being provided with a longitudinal slot on its frame side, a nut disposed in the slot, a stud bolt having its one end screwed into the nut in the slot and its other end disposed through said aperture, and a plurality of nuts disposed on the stud bolt for adjustably fixing the bolt in the aperture to hold the skirt in correct position with reference to the steps.

3. In a moving stairway having an endless series of moving steps, a balustrading for one side of the steps comprising a longitudinal frame disposed in line with the moving steps, said frame being provided with a transverse aperture, a longitudinal skirt panel disposed between the frame and the steps, said skirt having a longitudinal T slot on its frame side, a nut slidably disposed in the T slot, a stud bolt having its one end screwed into the nut into the slot and its other end disposed through the aperture in the frame, and a nut disposed on the stud bolt at each side of the frame for adjustably fixing the bolt in the aperture to hold the skirt in correct position with reference to the steps.

4. In a moving stairway having an endless series of moving steps, a balustrading for one side of the steps comprising a longitudinal frame disposed in line with the moving steps, said frame being provided with a transverse aperture, a longitudinal skirt panel disposed between the frame and the steps to enhance the safe operation of the steps, a longitudinal bar provided with a T slot mounted on the frame side of the skirt with the T slot opening outwardly, a bolt having its one end secured in the T slot and its other end disposed through the aperture in the frame, and a

plurality of nuts disposed on the bolt where it passes through the aperture for adjustably fixing the bolt in the frame to hold the skirt in correct position with reference to the steps.

5. In a moving stairway having an endless series of moving steps, a balustrading for one side of the steps comprising a longitudinal frame disposed in parallel with the moving steps, a longitudinal bar mounted on the frame and provided with a transverse aperture, a longitudinal skirt panel disposed between the frame and the steps for enhancing the safe operation of the steps, a T-slot bar, means for fixing the T-slot bar on the frame side of the panel with the T slot opening toward the frame and in line with the moving steps, a nut slidably disposed in the T slot, a stud bolt having its one end screwed into the nut and its other end disposed through the aperture, and a nut disposed on the bolt at each side of the longitudinal bar for adjustably fixing the bolt to hold the skirt panel in its correct position with reference to the steps.

6. In a moving stairway having an endless series of moving steps, a balustrading for one side of the steps comprising, a longitudinal frame disposed in line with the moving steps, said frame being provided with a plurality of transverse apertures, a longitudinal skirt panel disposed between the frame and the steps, said panel having on its frame side a longitudinal T-slot opening toward the frame, a plurality of bolts having their inner ends disposed in the T-slot and their outer ends disposed in the apertures in the frame, and a plurality of nuts on each bolt for adjusting and fixing the position of the bolts and consequently the skirt with reference to the side of the steps.

7. In a moving stairway having an endless series of moving steps, a balustrading for one side of the steps comprising a longitudinal frame disposed in parallel with the steps, a longitudinal bar mounted on the frame and provided with a plurality of transverse holes disposed in spaced apart positions in a line parallel to the steps, a longitudinal skirt panel disposed between the frame and the steps for enhancing the safe operation of the steps, a slot bar provided with a T-slot mounted on the frame side of the panel with its T-slot opening outwardly toward the longitudinal bar, a plurality of nuts slidably disposed in the T-slot of the slot bar, a plurality of stud bolts each of which has its one end screwed through a nut in said slot and its other end disposed in one of the holes in the longitudinal bar, and a nut on each bolt on each side of the longitudinal bar for adjustably fixing the bolts in the longitudinal bar to hold the skirt in correct position with the steps.

8. In a moving stairway having an endless series of moving steps, a balustrading for a side of the stairway comprising a frame, a longitudinal bar fixed on the frame, said bar being provided with a plurality of spaced apart apertures, a longitudinal balustrade skirt disposed between the balustrade frame and the steps, said skirt being provided with a longitudinal outwardly opening T-slot on its inner surface, and a plurality of push and pull bolts each of which has one end disposed in the slot and its other end disposed in one of the apertures for adjustably fixing the skirt in correct position with reference to the steps.

JAMES DUNLOP.