

April 15, 1952

L. J. NIXON

2,593,336

HINGED AND COLLAPSIBLE STAIRWAY

Filed July 3, 1947

2 SHEETS—SHEET 1

Fig. 1.

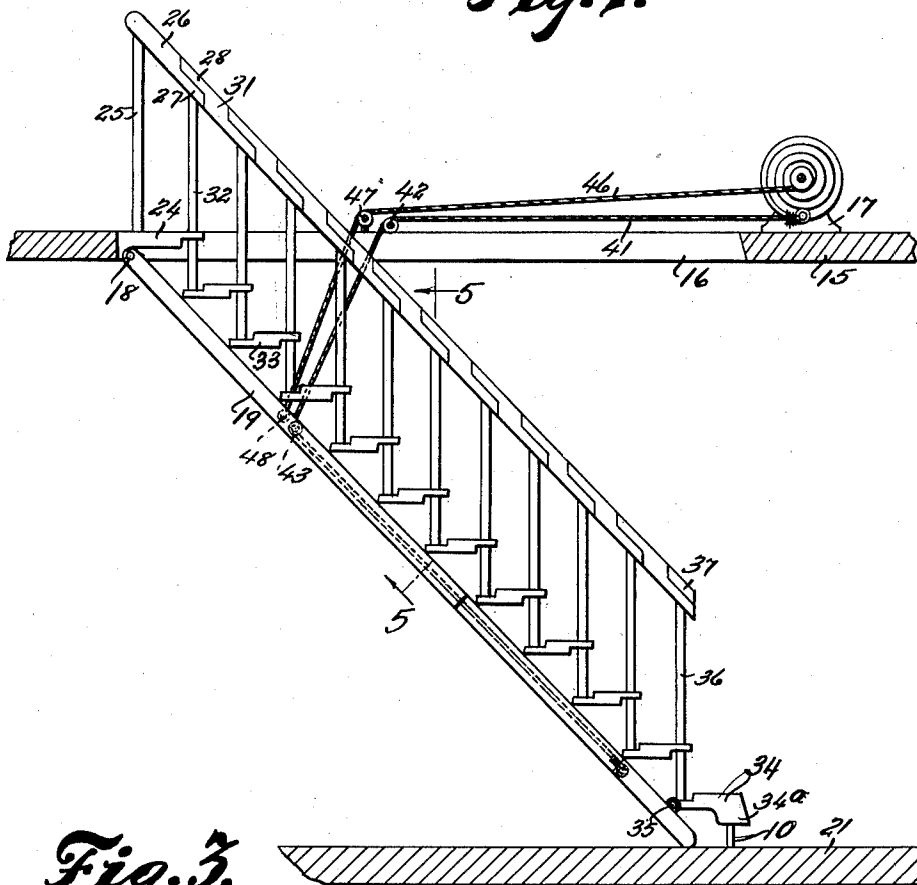
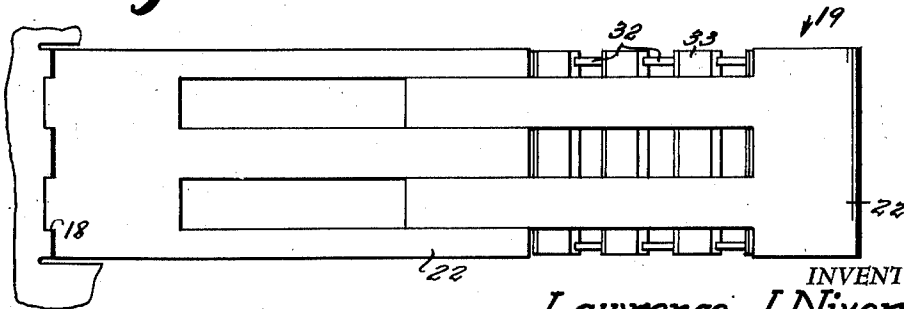


Fig. 3.



INVENTOR.
Lawrence J. Nixon
BY *Victor J. Evans & Co.*

ATTORNEYS

April 15, 1952

L. J. NIXON

2,593,336

HINGED AND COLLAPSIBLE STAIRWAY

Filed July 3, 1947

2 SHEETS—SHEET 2

Fig. 2.

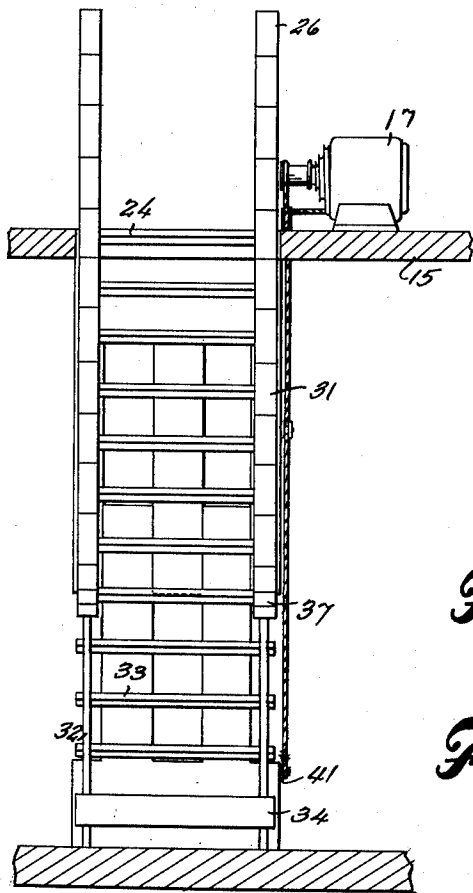


Fig. 5.

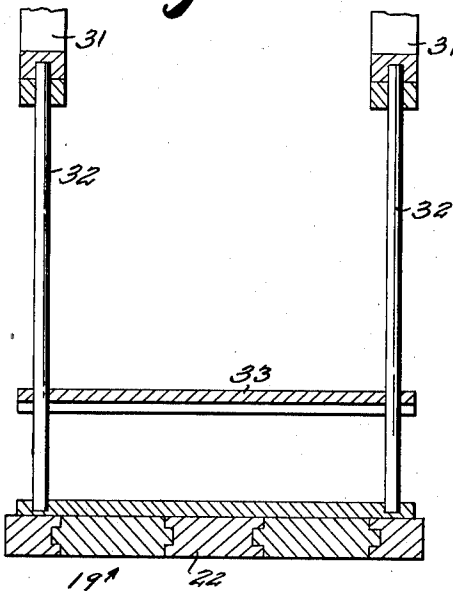


Fig. 6.

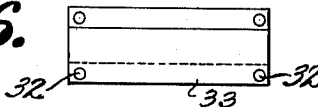


Fig. 7.

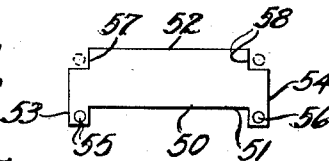
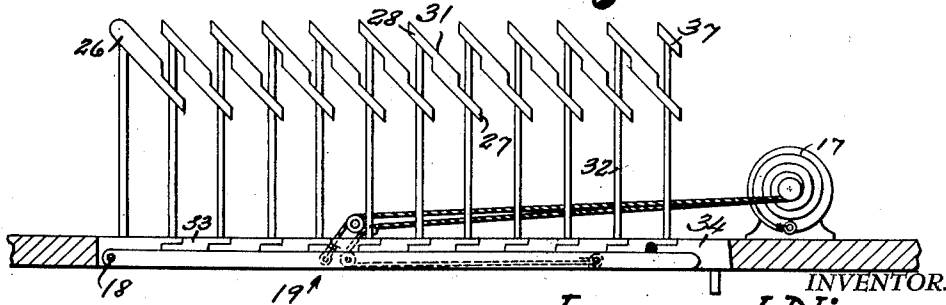


Fig. 4.



Lawrence J. Nixon

BY Victor J. Cranstetter

ATTORNEYS

UNITED STATES PATENT OFFICE

2,593,336

HINGED AND COLLAPSIBLE STAIRWAY

Lawrence J. Nixon, Pittsburgh, Pa.

Application July 3, 1947, Serial No. 758,784

6 Claims. (Cl. 228—50)

1

This invention relates to a collapsible stairway.

It is an object of the present invention to provide a collapsible stairway adapted to be raised to the ceiling of a room wherein there is provided sectional hand rails with the sections formed to separate from one another as the stairway is raised into the ceiling and having overlapping edges positioned to be nested and closed when one end of stairway is lowered to the floor of the room.

It is another object of the present invention to provide stairs or steps which are adjustable as the stairway is moved between its raised and lowered positions and wherein the sectional hand rail pieces are connected respectively with the stairs or steps to be adjusted by the steps.

With these ends in view the invention embodies a folding or collapsible stairway having a plurality of separable steps each having an overlapping tongue on the forward edge and a recess in the upper surface of the rear edge providing a ledge to receive the tongue of the adjoining step, and a balustrade in which the hand rail is formed in sections with overlapping tongues extending from the rear edges and recesses in the forward edges providing ledges to receive the tongues of adjoining sections, and the sections of the hand rail are carried by balusters extending vertically upward from the ledges of the steps and through the tongues of the steps, and the steps with the balusters and hand rail sections may be provided as independent units or combined with stringers or supporting elements of any suitable type or design.

For a better understanding of the invention reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevational view of the stairway lowered to the floor position and adjusted so that it can be traversed.

Figure 2 is a front elevational view of the stairway in the same position as shown in Figure 1.

Figure 3 is a bottom plan view of the stairway.

Figure 4 is a longitudinal sectional view taken through the ceiling and looking in elevation upon the stairway after the same has been extended to the raised position and the sectional hand rail pieces separated from one another and the stair step pieces folded into one another.

Figure 5 is an enlarged transverse cross sectional view taken through the stairway when in a lowered position and as viewed on line 5—5 of Figure 1.

2

Figure 6 is a top plan view of a single step.

Figure 7 is a top plan view of an alternate form of step.

Referring now to the figures, 15 represents a floor or ceiling having an opening 16 therein and above which is located an electric motor 17. To this opening 16 as indicated at 18 there is connected a stairway embodying the features of the present invention. This stairway has a rigid bottom plate-like member or stringer 19 which is pivoted at 18 and the lower end of the same will rest upon the floor 21. The base member 19 is formed of a plurality of interlocked pieces 22. At the pivot point 18 is a single stationary step 24 from which there extends upwardly a post 25. On the upper end of the post 25 is a hand rail piece 26 having an end 27 adapted to be overlapped by an end 28 of a piece 31 carried upon a post 32 slidable through the end 27 and the forward edge of the step 24. The post is mounted on the rear edge of an intermediate step 33. The subsequent post 32, in sequence slide through the end 27 of the subsequent hand rail piece 31 and the forward edges of the subsequent steps. The hand rail pieces 31 following down the stairway are of similar construction. When the stairway is down, the pieces 31 nest with one another and form a continuous stairway rail or baluster.

At the lower end of the stringer 19 there is pivoted as indicated at 35 a bottom step 34 having a member or foot 34a adapted to be supported from the floor 21 by supports 10 which additionally support the step 34. A top piece 37 on the upper end of the post 36 is connected to the bottom step 34 which is connected by bolts 35 to the stringer, and with the preceding hand rail piece 31 forms the lower end of the baluster rail.

The member 19, as above related, is formed of relatively slidable parts 22 which can be extended as shown in Figure 3 or retracted. As the free end of member 19 is pivoted to the floor and the parts 22 are extended, the steps 33, and the posts 32 will be lowered and the rail pieces 31 will be brought into the position shown in Figure 1. A rope 41 is drawn over pulley 42 on the ceiling 15 and over pulley 43 on the member 19 whereby to retract the part 22 as the member 19 and the steps are raised into the ceiling.

A rope 46 is connected to the motor 17 and extends over a pulley 47 for connection with the member 19 as indicated at 48 whereby to effect the lifting action of the stairway into the opening 16, as parts 22 of member 19 are being retracted in the manner described previously.

The extension and retraction of the member 19 as it is lowered from the position shown in Figure

3

4 to the position shown in Figure 1, will permit the steps to slide downwardly over the member which is being extended and the rail pieces 31 will come into overlapping engagement with one another.

In the modification illustrated in Figure 7 a step 50 is provided with a recess 51 in the forward edge and a tongue 52 on the opposite edge is positioned to nest into the recess of an adjoining step with the steps collapsed. In this design the forward edge of the step is provided with projections 53 and 54 upon which posts 55 and 56 are mounted and the rear edge is provided with notches 57 and 58 whereby the steps clear the corresponding posts of adjoining steps.

While various changes may be made in the detailed construction it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

I claim:

1. A collapsible stairway adapted to be positioned in an opening through a floor comprising a stationary step having a tongue extended from the forward edge and a recess in the under surface of the rear edge mounted in the floor and positioned in one end of the said opening, vertically positioned balusters carried by the said stationary step, a plurality of slidably connected intermediate steps also having over-lapping tongues on the forward edges and recesses in the upper surfaces of the rear edges which provide ledges to receive the tongues of adjoining steps, a hand-rail having a plurality of sections with over-lapping tongues on the rear edges and recesses in the upper surfaces of the forward edges which provide ledges to receive the tongues of adjoining sections, balusters positioned on the ledges at the rear of the intermediate steps and extended through openings in tongues of upwardly disposed steps and on the upper ends of which the sections of the hand-rail are carried whereby the balusters connect the sections of the hand-rail to the steps providing intermediate units of the stairway, an upper hand-rail section carried by said vertically positioned baluster on the stationary step and having a recess in the upper surface of the forward edge for receiving the tongue of the upper intermediate section of the hand-rail, and a relatively extensible stringer pivotally mounted in the recess in the under surface of the upper stationary step, extended below the intermediate steps and positioned to be engaged by the rear edges of said intermediate steps for supporting the steps with the stairway extended downwardly for use.

2. A stairway having foldable steps comprising a fixed top step, an inclined carrier having the upper end pivoted to said top step, a bottom step pivoted to the carrier near the lower end of the latter, intermediate steps resting at their rear edges on the carrier, a baluster fixed to the bottom of each intermediate step, each baluster having slidable engagement with the next high step to the one to which it is fixed providing interconnecting means between the steps, a baluster fixed to the top step, and a hand-rail section fixed to the balusters, the handrail sections on the balusters of the top and intermediate steps each having slidable engagement with the balusters of the next lower steps.

3. In a collapsible stairway, the combination which comprises a floor having an elongated rec-

4

tangular shape opening therein, a stationary step forming part of the floor and positioned in one end of said opening, an extensible panel forming a stringer, means pivotally connecting the upper end of the stringer to the under surface of said stationary step, a plurality of intermediate steps with over-lapping edges and having openings through their outer edges positioned above the stringer, balusters extending upwardly from the stationary step, a stationary hand-rail section on the upper ends of the balusters of the stationary step, balusters extended upwardly from the rear edges of the intermediate steps and extended through the openings in the outer edges of steps above providing interconnecting means between the steps, a lower step pivotally attached to the stringer, balusters extended upwardly from the rear edge of said lower step and extended through openings in the outer edge of the next step above, and over-lapping hand-rail sections carried by the upper ends of the balusters, the rear edges of said steps resting upon and supported by the said stringer.

4. In a collapsible stairway, the combination which comprises a stationary step positioned at the upper end of the stairway, a relatively extensible stringer pivotally mounted on the said stationary step and positioned to extend downwardly from said stationary step, a plurality of slidably connected intermediate steps extended from said stationary step and positioned to rest upon and coact with the stringer for providing a stairway, balusters extended upwardly from said stationary and intermediate steps, said balusters positioned on the rear edges of the steps and extended upwardly through the forward edges of the steps above providing the slidable connecting means between the steps, and hand rails including a plurality of over-lapping sections supported by the balusters and positioned whereby the sections correspond with the steps, the hand-rail sections at the upper ends of the hand-rails being fixedly mounted on the balusters extended upwardly from said stationary step, respectively, said balusters connecting the steps to the sections of the hand-rails respectively, whereby the steps are adapted to be positioned to provide a stairway or to be positioned in a common plane.

5. A collapsible stairway as described in claim 4, wherein the step at the lower end of the stairway is pivotally attached to the lower end of the stringer.

6. A collapsible stairway as described in claim 4, wherein the bottom step on the stairway is pivotally attached to the lower end of the stringer and in which means is provided for retracting the stringers and collapsing the steps and hand-rails.

LAWRENCE J. NIXON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
547,337	Deane	Oct. 1, 1895
616,515	Williams	Dec. 27, 1898
1,166,141	Merrettig	Dec. 28, 1915
1,594,655	Bessler	Aug. 3, 1926
1,614,006	Loetscher	Jan. 11, 1927
2,220,155	Jaclim	Nov. 5, 1940