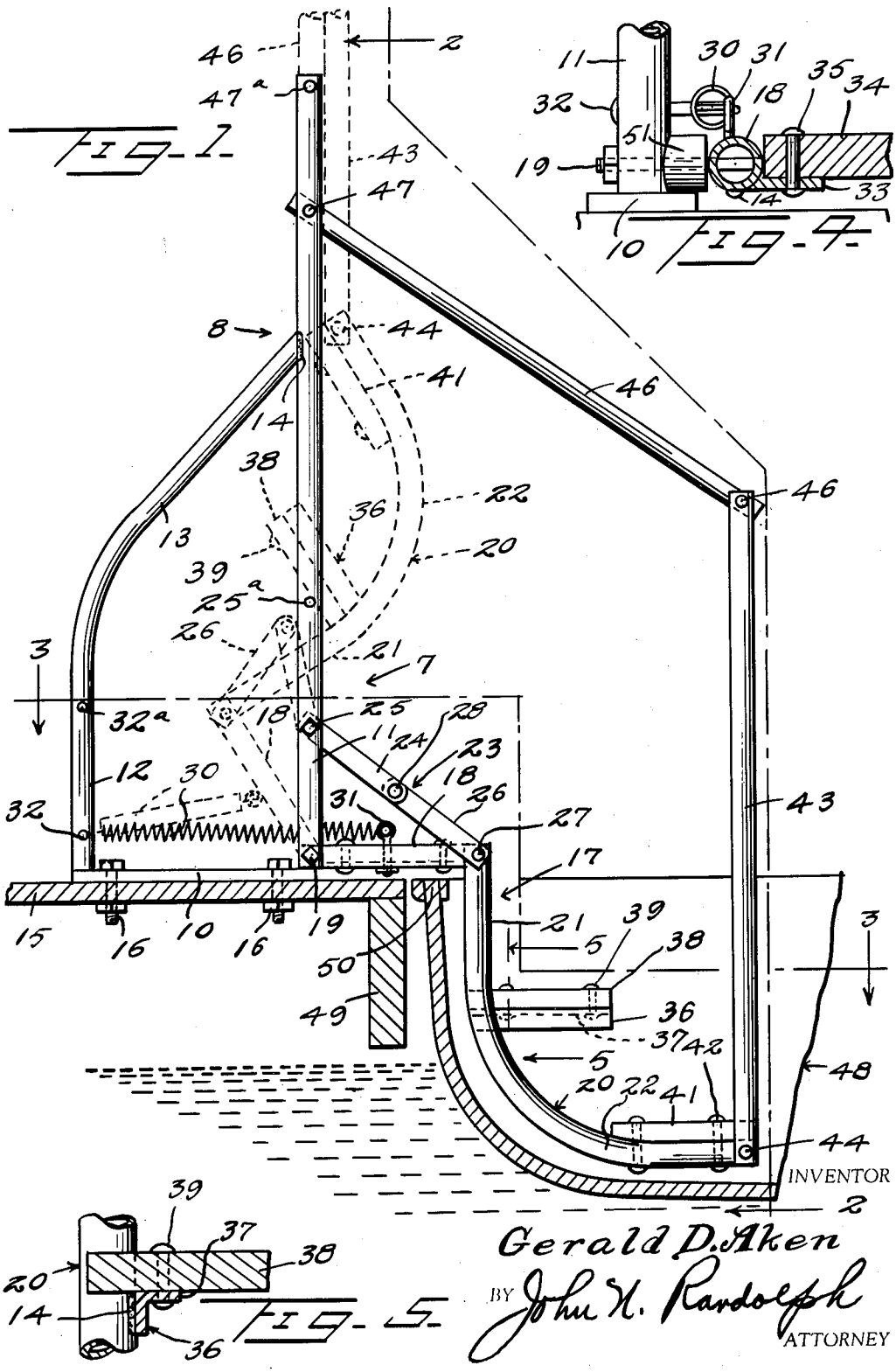
Oct. 25, 1955 G. D. AKEN 2,721,345

BOAT STAIRS

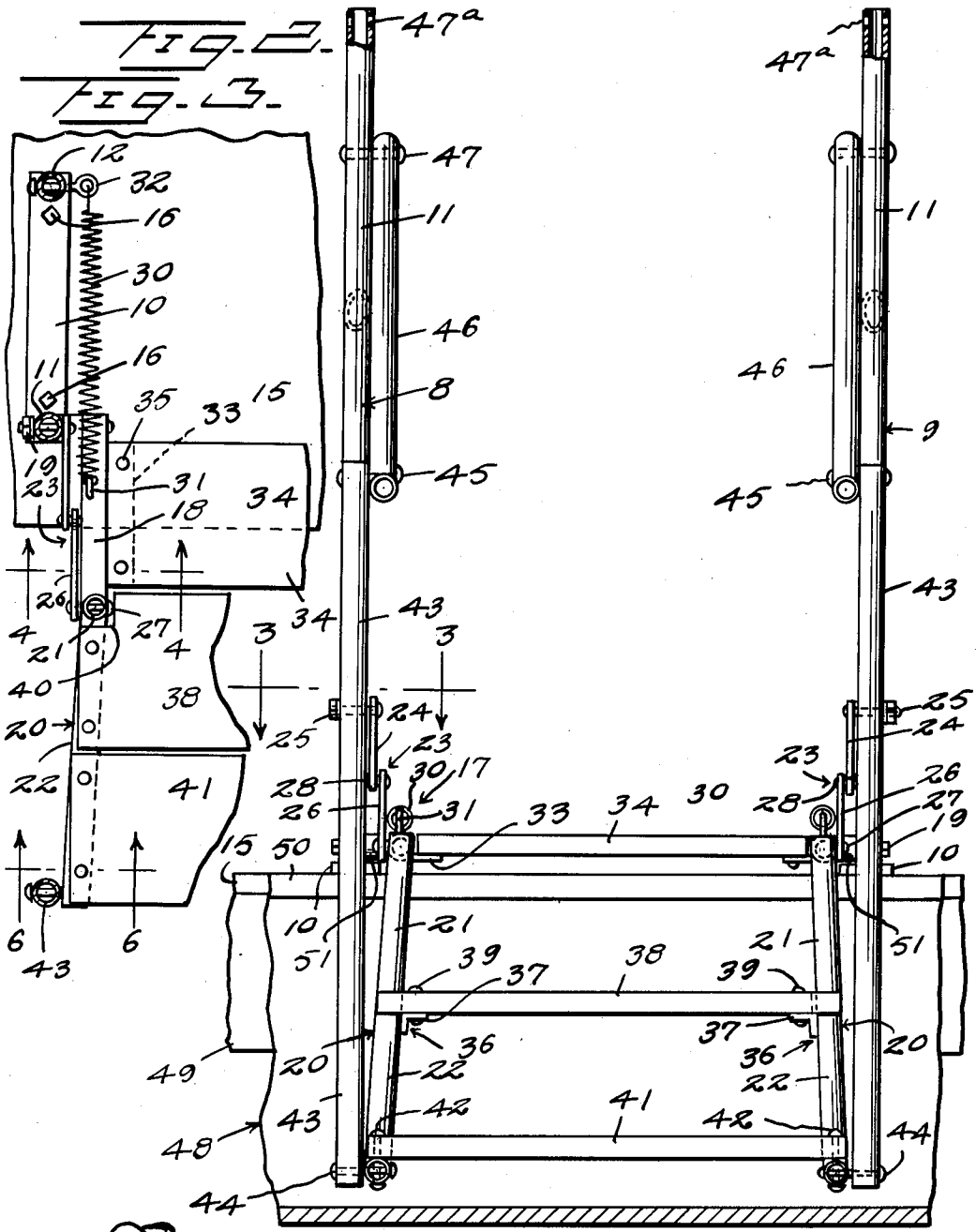
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BOAT STAIRS

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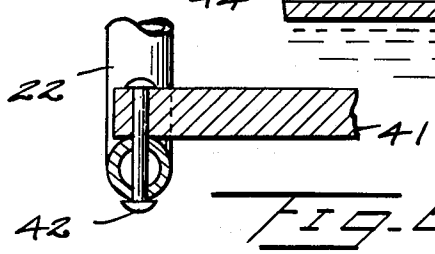


FIG. 6

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BOAT STAIRS

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5 Claims. (Cl. 14—71)

This invention relates to a novel boat stairs adapted to be secured to the deck of a wharf or pier and having a stairway extending downwardly from an end or side of the pier into a boat to enable elderly persons or cripples to readily walk aboard or walk from a small boat.

More particularly, it is an aim of the present invention to provide a stairway for small boats such as rowboats, having stairs extending downwardly into the boat to adjacent the bottom thereof and which stairway is swingable upwardly to a position above the dock or pier on which the boat stairs is secured so as not to interfere with movement of the boat away from the dock or pier or with movement of the boat into a position adjacent the pier to receive the boat stairs.

Still another object of the invention is to provide a boat stairs which will effectively function to hold a boat steady alongside of a pier or dock while the stairs are in use.

Still another object of the invention is to provide a boat stairs having handrails at each side thereof by which elderly persons and cripples may steady themselves while boarding or leaving a boat and which are swingable with the boat stairs to an inoperative position above the pier or rock to one side of the boat, when the stairs are not in use.

Still a further object of the invention is to provide means for adjusting the level of the stairway relatively to a dock or pier on which the boat stairs is secured for accommodating the stairway to different water levels.

Still another object of the invention is to provide a boat stairs which is extremely compact and will occupy a minimum of space on a pier or dock, yet which is of adequate strength to support the weight of as many persons as can stand on the stairway.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a side elevational view of the boat stairs shown in an applied position, and illustrated in full lines in an operative position and in dotted lines in an inoperative or folded position;

Figure 2 is a front elevational view thereof taken substantially along a plane as indicated by the line 2—2 of Figure 1;

Figure 3 is a fragmentary horizontal sectional view taken substantially along planes as indicated by the line 3—3 of Figure 1 and the line 3—3 of Figure 2;

Figure 4 is an enlarged vertical sectional view taken substantially along a plane as indicated by the line 4—4 of Figure 3;

Figure 5 is an enlarged vertical sectional view taken substantially along a plane as indicated by the line 5—5 of Figure 1, and

Figure 6 is an enlarged vertical sectional view taken substantially along a plane as indicated by the line 6—6 of Figure 3.

Referring more specifically to the drawings, the boat

stairs in its entirety, and as illustrated in Figures 1 and 2, is designated generally 7, and includes two corresponding supporting sections 8 and 9, each including a bar forming a base 10 having an upright post 11, which is preferably of tubular construction, fixed to and rising from a front end thereof. Each supporting section 8 and 9 also includes a combination rear post and brace which is likewise preferably of tubular construction and which includes a lower post portion 12 which is fixed to and rises from the other rear end of the base 10 and an upper diagonal brace portion 13. The brace portion 13 constitutes an oblique extension of the upper end of the post 12 formed by bending the post toward the upright front post 11. The brace 13 is disposed at an oblique angle to the front and rear posts and is secured at its upper end to the front post 11 in any suitable manner as by welding, as indicated at 14.

The supporting sections 8 and 9 constitute the rigid supporting frame of the boat stairs 7. The base members or bars 10 thereof are secured to the upper side of a deck or platform 15 constituting a part of a wharf, dock or pier adjacent an end or side edge thereof and with said base members or bars 10 disposed perpendicular to said end or edge of the deck 15 and spaced therefrom, so that the front posts 11, which are disposed nearest the adjacent end or edge of the wharf deck 15 are spaced therefrom. The sections 8 and 9 are secured to the deck 15 in spaced apart substantially parallel relationship to one another, a distance slightly greater than the width of the stairway, hereinafter to be described. Said base members or bars 10 are preferably secured each by a pair of nut and bolt fastenings 16.

Said stairway, designated generally 17, includes a pair of rigid tubular arms 18 corresponding ends of which are swingably connected by fastenings 19 to the front posts 11, on the inner sides of said front posts and near their lower ends. A curved stair tread supporting arm 20 is secured at one end thereof to the opposite end of each straight arm 18 in any suitable manner. The tread supporting arms 20 are each substantially longer than the arms 18 and each includes a substantially straight end portion 21. The straight end portions 21 are secured to the arms 18 to form substantially a right angle therewith. The arms 20 also include longer arcuately curved opposite end portions 22 forming curved continuations of the portions 21, the terminals of which portions 22 may be substantially straight, as illustrated in Figure 1. The arcuate portions 22 curve in a direction away from the rigid arms 18. The connected tread supporting arms 18 and 20 are braced by braces, designated generally 23, each including an upper bar 24 one end of which is pivotally connected by a fastening 25 to the post 11 on the inner side thereof and above and adjacent the adjacent arm 18. A second bar 26 of the brace 23 has one end pivotally connected by a fastening 27 to the upper end of the tread arm 20. The opposite adjacent ends of the brace bars 24 and 26 are pivotally connected to one another by a fastening 28. Thus, when the two braces 23 are disposed in extended positions as illustrated in Figure 1, the arms 18 will be supported by the braces 23 in extended positions at substantially right angles to the posts 11, so as to extend outwardly from said posts 11 beyond the adjacent end or edge of the deck 15 and so that the tread arms 20 will extend downwardly and outwardly from said end or edge of the deck 15.

A pair of counterbalance pull springs 30 are provided, the forward ends of which are connected to anchoring members 31 which are secured to and extend upwardly from the arms 18 intermediate of their ends. The opposite rear ends of the counterbalance springs 30 are anchored to anchoring members 32 which are secured to and extend inwardly from the rear posts 12 and so that

the springs 30 are under tension and disposed substantially parallel to the arms 18 when said arms are in extended positions as illustrated in Figure 1, at substantially right angles to the front posts 11.

Tread supporting bars or flanges 33 are secured to the rigid arms 18, as by means of welding, as indicated at 14, and said bars or flanges 33 extend inwardly from the arms 18 adjacent the undersides thereof, as best seen in Figure 4. An upper step or tread 34 is disposed between the arms 18 and has its ends resting upon the bars or flanges 33 and secured thereto by fastenings 35. The stair tread supporting arms 20 are each provided with a stair tread supporting bracket 36, as best illustrated in Figure 5, including a bar of angle iron having an inner end which is secured thereto adjacent the junction of the portions 21 and 22 thereof and which projects outwardly therefrom in partially overlying relationship to the arm portion 22. The inner end of the bracket 36 is secured as by welding as indicated at 14 to the arm 20 on the inner side thereof and has an inwardly extending top flange 37. An intermediate stair step or tread 38 has portions located adjacent the ends thereof resting on the horizontal bracket portions 37 and secured thereto by fastenings 39. The rear corners of the stair tread 38 may be notched as seen at 40 to accommodate portions of the arms 20, as best seen in Figure 3. A bottom tread or stair step 41 has end portions resting on the lower substantially straight terminals of the arm portions 22 and which are secured thereto by fastenings 42.

The stairway 17 includes a pair of bottom stair posts 43 the lower ends of which are disposed on the outer sides of the lower terminal ends of the arms 20 and are pivotally connected thereto by fastenings 44. The upper ends of the stair posts 43 are pivotally connected by fastenings 45 to the lower ends of handrails 46 which extend upwardly and rearwardly therefrom and which are pivotally connected by fastenings 47 at their upper ends to the front posts 11 near the upper ends thereof. The handrails 46 are disposed on the inner sides of the posts 11 and 43. Said posts 43 and handrails 46 are likewise preferably of tubular construction.

From the foregoing it will be readily apparent that the knee joints 28 will break downwardly when moving the stairway 17 to its folded or collapsed, inoperative position as illustrated in dotted lines in Figure 1 and which is accomplished by swinging the arms 18 upwardly on their pivots 19. The pull springs 30 will substantially counterbalance the weight of the stairway 17 in its movement from its operative full line position of Figure 1 to its dotted line position thereof. In the movement of the arms 18 and the tread 34 carried thereby from the full line to the dotted line positions of said arms, the upper brace bars 24 initially swing downwardly clockwise and are thereafter pulled upwardly counterclockwise to their dotted line position of Figure 1 by the brace bars 26. The upper bars 24 swing upwardly across the inner sides of the posts 11 and the lower brace bars 26 pass between the brace bars 24 and the arms 18. The arms 18 are spaced from the posts 11 by spacer elements 51 (see Figure 4) so that the brace bars 26 can swing between the bars 24 and arms 18 in moving from their full line to their dotted line positions of Figure 1. The arms 20 and the stair treads 38 and 41 supported thereby swing in unison with the arms 18 to assume the position as shown in dotted lines in Figure 1 between the front posts 11. The handrails 46 simultaneously swing to upright positions on the inner sides of the front posts 11 and the stair posts 43 swing relatively to said handrails and to the arms 20 to assume upright positions against the front sides of the posts 11. With the boat stairs 7 thus disposed in a folded position above the deck 15, a rowboat or the like, a portion of which is illustrated in Figures 1 and 2 and designated 48, may move to a position along a side or end 49 of the wharf or pier, adjacent which the boat

stairs is disposed. The boat stairs may then be swung downwardly back to the full line position of the parts and so that the arms 18 will extend outwardly from the dock side 49 over the inboard gunwale 50 of the boat 48 to permit the tread supporting arms 20 to extend downwardly and outwardly and to be disposed within the boat 48 and positioned to substantially conform to the cross sectional contour of the inboard half of the hull thereof, as illustrated in Figure 1. It will thus be seen that the boat stairs 17 when disposed as illustrated in Figures 1 and 2 will not only function as stairs but will additionally function to retain the boat 48 adjacent the wharf side or end 49. A person, as for example an elderly person or cripple, may walk between the supporting sections 8 and 9 and grasp the handrails 46 and be assisted thereby in stepping from the deck 15 onto the upper tread 34 and thence downwardly onto the intermediate tread 38 and bottom tread 41, and from said bottom tread into the bottom of the boat 48 which is disposed adjacent thereto. After all persons are aboard, the bottom tread 41 can be grasped to swing the stairway 17 upwardly to its dotted line position of Figure 1, as previously described, and with slight effort, assisted by the counterbalancing springs 30, so that it will not obstruct movement of the boat away from the dock or pier or the movement of another boat into the position of the boat 48.

The stairway 17 may be elevated relatively to the supporting sections 8 and 9 to any necessary extent to accommodate a rise in water level. For example, the arms 18 could be attached by their fastenings 19 to the front posts 11 at the points where the fastenings 25 are shown engaging said posts. The fastenings 25 could then be connected to the posts through the openings 25*a* thereof, the handrails 46 could then be connected to the posts 11 through the openings 47*a* thereof and the springs 30 can be anchored to the rear post openings 32*a*. Obviously, any number of sets of openings could be provided in the posts 11 to make various adjustments in the level of the arms 18 relatively to the deck 15. A lowering of the water level offers no problem as this merely results in the bottom tread 41 being spaced a somewhat greater distance from the boat bottom.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. In combination with a part of a pier deck including an edge portion and a pier side member extending downwardly from said edge portion, a stir supporting means including a pair of spaced posts, means securing said posts in upright positions on the deck part and substantially parallel to said deck edge, a stairway including a pair of corresponding stair tread suporting arms having inner end portions disposed between and swingably connected to said posts, said inner end portions extending outwardly from the posts beyond said deck ege and side member in an operative position of the stairway, hinge brace means connecting the posts and arms at points spaced from the connections of the arms to the posts, said tread supporting arms having portions depending from said inner end portions and extending downwardly therefrom and spaced outwardly with respect to said deck edge and sie member in the operative position of the stairway, for cooperation therewith to confine a side of a boat hull between said depending arm portions and said side member, and stair treads extending between and supported by said stair tread supporting arms including at least one stair tread supported by the depending arm portions and adapted to be disposed within the boat, said stairway being swingable upwardly about the pivotal connection of the arms to the posts for swinging the stairway to a raised inoperative position above said deck portion for releasing the boat from a confined position between the stairway and said pier side member.

2. In a combination as defined by claim 1, counterbalance pull spring means connected to the stairway at a point spaced from the connection of the stairway to the posts, and fixed anchoring means to which the spring means is connected remote from the stairway and posts, said spring means extending across the connection of the stairway to the posts and being disposed substantially parallel to the inner end portions of the supporting arms and said deck part when the stairway is in an operative position, the portion of the spring means connected to the stairway being swingable upwardly therewith relative to the part thereof connected to the anchoring means for causing said spring means to assume a position for urging the stairway to swing upwardly to an inoperative position and for retaining the stairway in an inoperative position.

3. In combination with an edge portion of a pier deck and a pier side member which extends downwardly from said deck edge, a boat stairs comprising spaced substantially upright supporting posts, means securing said posts on the deck portion, a stairway including corresponding tread supporting arms having complementary ends disposed between and swingably connected to said posts, each of said arms including a straight end portion having a distal end pivotally connected to one of the posts and a second straight portion extending at substantially a right angle from the opposite end of the first straight portion and normally depending therefrom and disposed outwardly relative to said deck edge and said pier side member, hinged brace means connecting said posts and arms at points spaced from the pivots of the arms to the posts, each of said arms including an arcuately curved portion extending from the other end of said second straight portion and curved in a direction away from the first straight portion, a plurality of stepped treads extending between and supported by said arms including a top tread supported between the first straight arm portions, a bottom tread supported by the distal ends of the curved arm portions and an intermediate tread supported by and extending outwardly from said second straight arm portions and disposed over parts of the curved arm portions, said first straight arm portions extending outwardly from said pier deck edge and being adapted to be disposed over a side of a boat for supporting the second straight arm portions and the curved arm portions within the boat and adjacent a portion of the boat hull in an operative position of the boat stairs, said second straight arm portions cooperating with said pier side member for confining the aforementioned boat side therebetween to retain the boat substantially immobile relative to the pier and boat stairs, said arms and the treads supported thereby being swingable upwardly to positions between said front posts and above said deck portion.

4. In a combination as defined by claim 3, stair posts pivotally connected to and rising from the arcuately curved portions of said arms, and handrails having corresponding ends pivotally connected to upper portions of the stair posts and opposite ends pivotally connected to said supporting posts, said handrails extending downwardly at an incline from the supporting posts when the stairway is in an operative position, said stair posts and handrails being swingable with the stairway relative to the supporting posts and being adapted to be disposed in substantially upright positions adjacent and substantially parallel to the supporting posts when the stairway is in a raised inoperative position.

5. In a combination as defined by claim 4, counterbalance pull spring means connected to the stairway at a point spaced from the connection of the stairway to the supporting posts, and fixed anchoring means to which the spring means is connected remote from the stairway and supporting posts, said spring means extending across the connection of the stairway to the supporting posts and and being disposed substantially parallel to the first mentioned end portions of the supporting arms and said deck portion when the stairway is in an operative position, the portion of the spring means connected to the stairway being swingable upwardly therewith relative to the part thereof connected to the anchoring means for causing said spring means to assume a position for urging the stairway to swing upwardly to an inoperative position and for retaining the stairway in an inoperative position.

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