

- [54] **FLOATING PIER WITH SELF
ADJUSTING STAIRWAY ASSEMBLY**
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- [51] Int. Cl. **E06c 1/38**
- [58] Field of Search **182/1, 97, 129**

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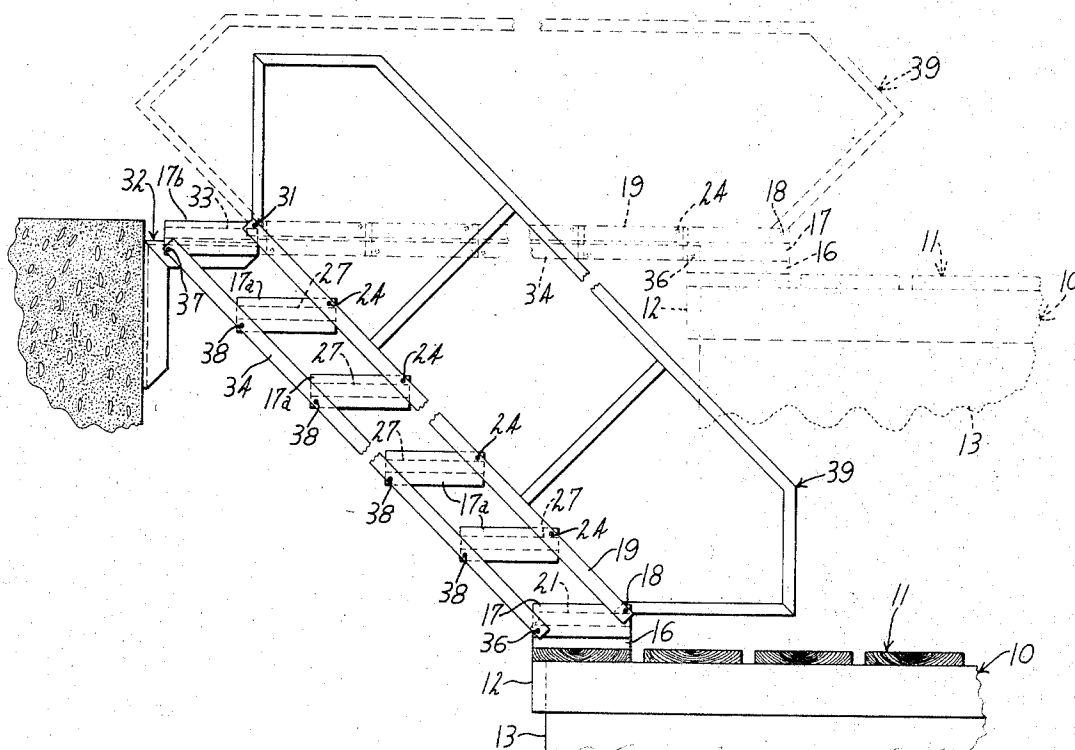
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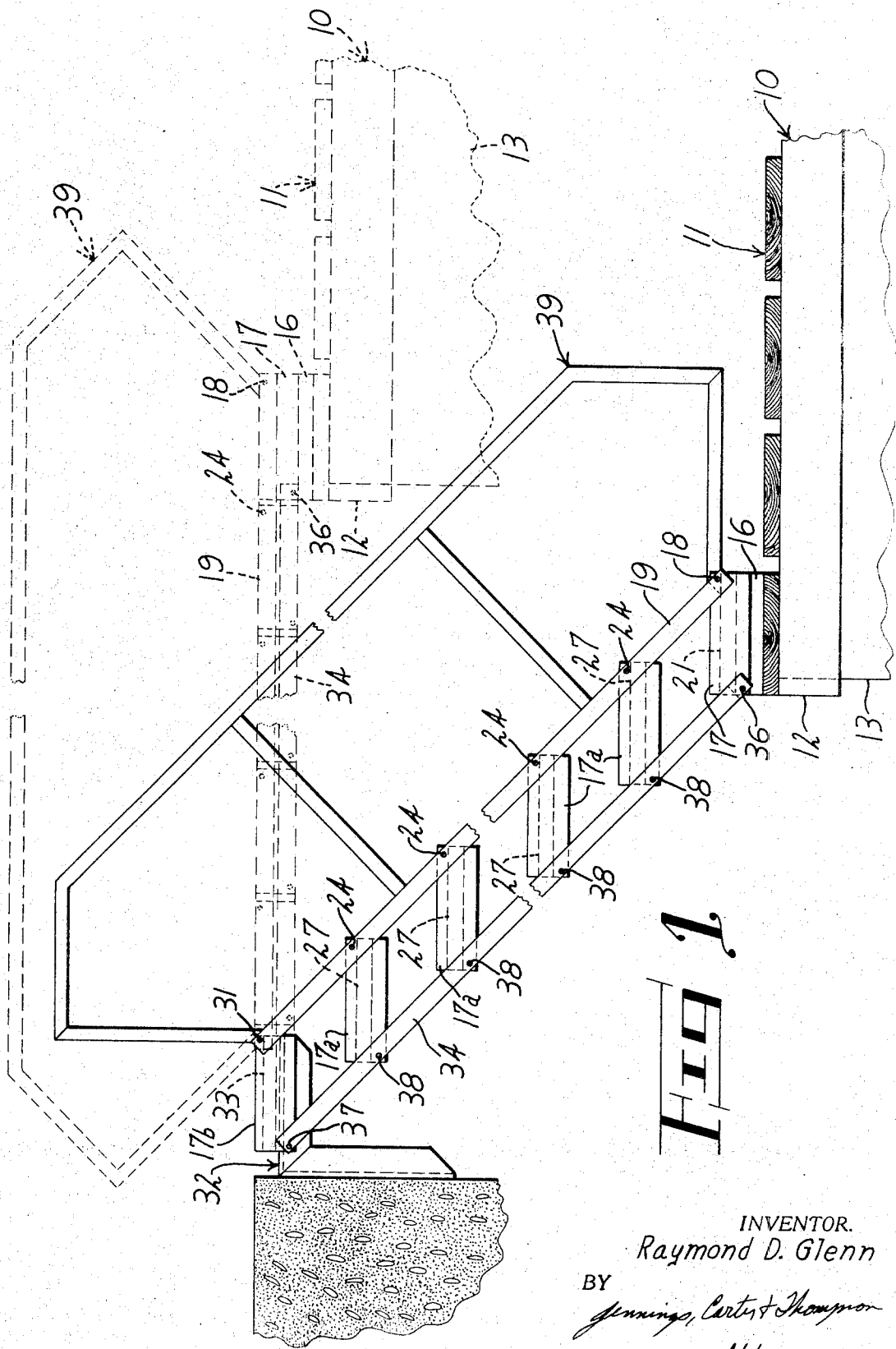
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[57] **ABSTRACT**

A buoyant pier is pivotally connected to the lower ends of laterally spaced, elongated, rigid support members with the other ends of the rigid support members pivotally connected to a supporting structure. Longitudinally spaced, parallel stair members extend horizontally between and are pivotally connected to the rigid support members. Other elongated support members extend between and are pivotally connected to the pier and the supporting structure to support and retain the stair members in parallel relationship as the pier moves to various elevations.

1 Claim, 3 Drawing Figures





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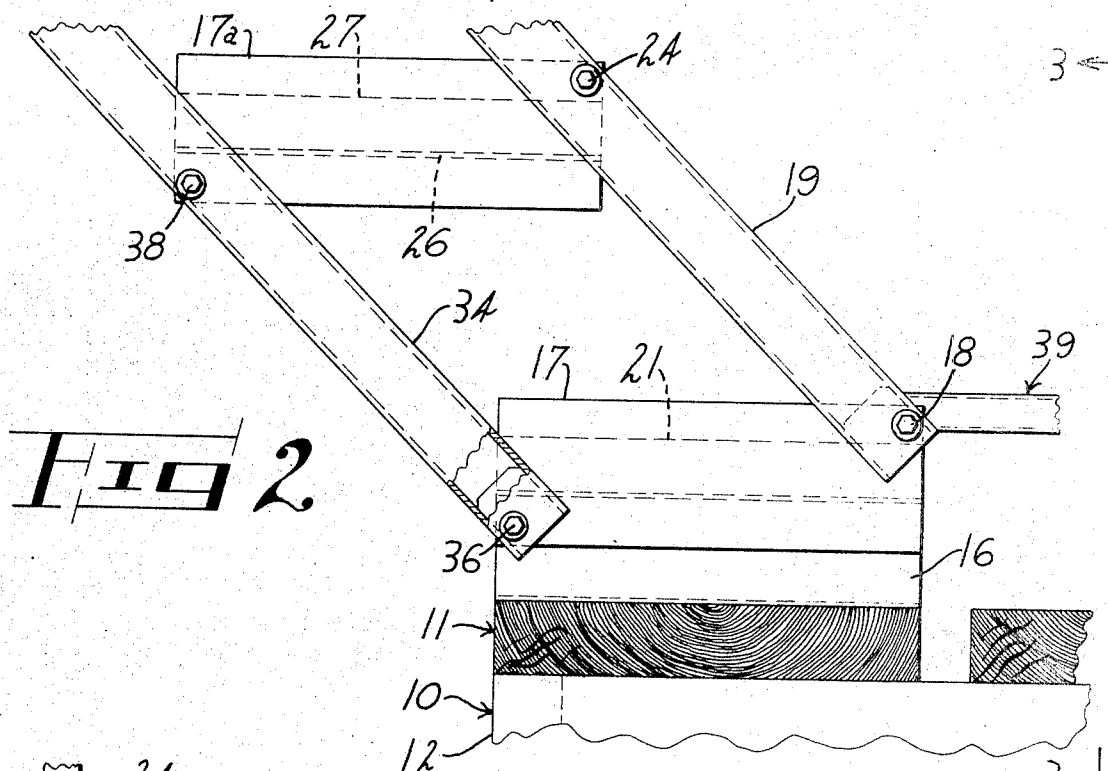


Fig 2

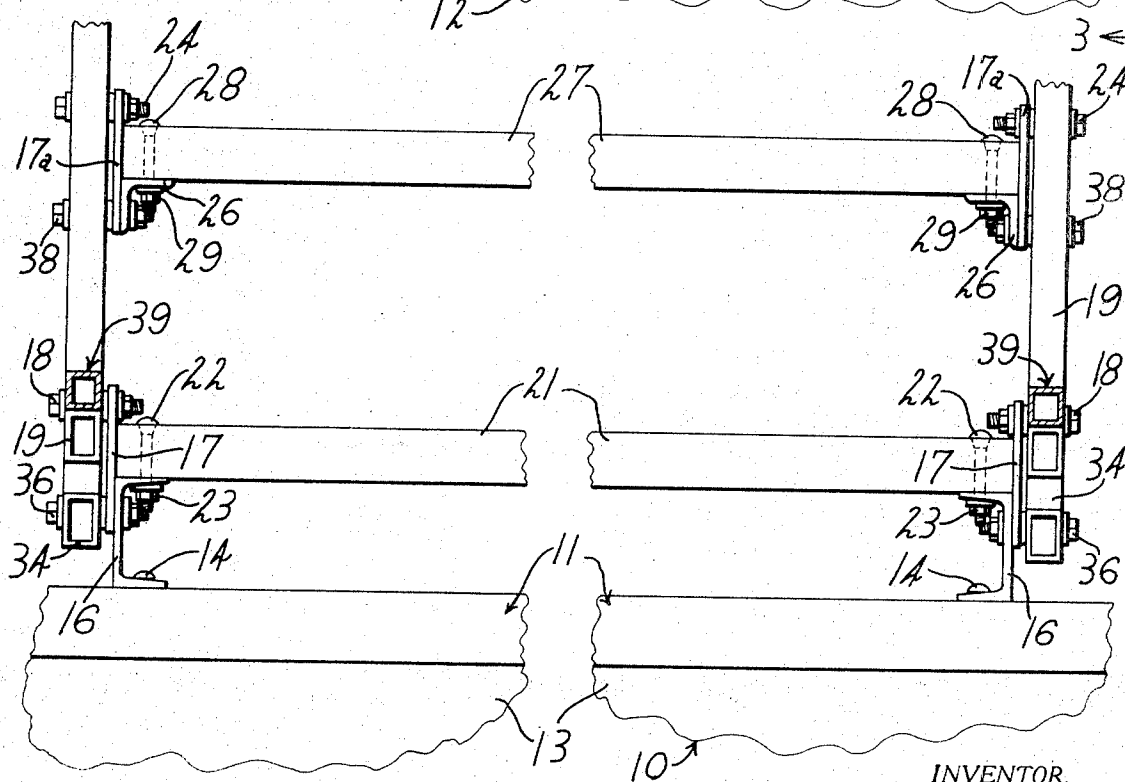


Fig 3

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FLOATING PIER WITH SELF ADJUSTING STAIRWAY ASSEMBLY

BACKGROUND OF THE INVENTION

This invention relates to a floating pier with a self adjusting stairway assembly and more particularly to such an assembly in which the stair members move vertically in response to changes in the elevation of the surface of the water supporting the floating pier while at the same time each stair member is retained in a horizontal plane.

Heretofore in the art to which my invention relates, difficulties have been encountered in providing a pier or dock where the elevation of the water varies. By providing a stationary pier, the surface of the pier would not remain at a predetermined elevation above the surface of the water as the surface moved to selected elevations. That is, the surface of the deck would be below the surface of the water while the water is at a high level and would be a substantial distance above the surface of the water while the water is at a low level. This would thus eliminate use of the pier during the time the pier was submerged due to high water and would necessitate the use of additional means for reaching the surface of the water where the water is at a low level.

BRIEF SUMMARY OF THE INVENTION

In accordance with my invention, I provide a buoyant pier adapted for vertical movement, with the surface of water in response to movement of the surface to various elevations. Laterally spaced elongated, rigid support members are pivotally connected at their lower ends to the pier while the upper ends thereof are pivotally connected to a supporting structure whereby the support members are adapted for angular movement relative to the pier and the supporting structure. Horizontal stair members extend between and are pivotally connected to the rigid support members. Other support members extend between and are pivotally connected to the pier and the supporting structure to support and retain the stair members in parallel relationship and in horizontal planes as the pier moves to various elevations.

Apparatus embodying features of my invention is illustrated in the accompanying drawings, forming a part of this application, in which:

FIG. 1 is a side elevational view, partly broken away and in section showing my improved assembly;

FIG. 2 is an enlarged, fragmental view, partly broken away and in section, showing the connection between the pier and the self adjusting stairway; and,

FIG. 3 is a fragmental view, partly broken away and in section, taken generally along the line 3—3 of FIG. 2.

Referring now to the drawings for a better understanding of my invention, I show a buoyant pier generally at 10 which comprises a wood deck 11 having depending side members 12 which extend over a foam-like mass of buoyant material 13 whereby the deck 11 is supported at a predetermined distance above the elevation of the surface of the water as the surface of the water moves to various elevations. In view of the fact that foam-like masses of plastic material have been employed heretofore as floats to support members on

the surface of water, no further description of the specific foam-like material is deemed necessary. However, one suitable foam-like material is sold under the trade name "STYROFOAM".

Secured to the deck 11 adjacent one side of the pier 10 by suitable retainer elements 14 are spaced apart channel-like members 16, as clearly shown in FIG. 3. Secured rigidly to each channel-like member 16 is an upstanding support bracket 17, which is preferably in the form of an elongated metal member. Pivotally connected to the forward end of each support bracket 17 by a pivot pin 18 is the lower end of an elongated, rigid support member 19. As shown in FIG. 3, the rigid support members 19 are spaced laterally from each other.

Extending between the upstanding support brackets 17 with the ends thereof resting on the upper surface of the channel-like members 16 is an elongated stair member 21. The ends of the stair member 21 are secured rigidly to the uppermost flange of the channel-like member 16 by bolts 22 having retaining nuts 23.

Pivotally connected to each elongated, rigid support member 19 at longitudinally spaced intervals, by pivot pins 24 are a plurality of upstanding support brackets 17a. Secured rigidly to each support bracket 17a, by suitable means, such as by welding, is an angle bracket 26 which is in position to support the adjacent end of a horizontal stair member 27, which is secured to the angle bracket 26 by bolts 28 having retaining nuts 29.

The upper end of each elongated, rigid support member 19 is pivotally connected by a pivot pin 31 to the forward end of an upstanding support bracket 17b which in turn is rigidly secured to a supporting structure indicated generally at 32. Extending between and secured rigidly to the upstanding support brackets 17b is a horizontal step member 33.

As shown in FIG. 1, other elongated support members 34 are pivotally connected at their lower ends by pivot pins 36 to the rear portion of the upstanding support bracket 17. The upper end of the other support members 34 are pivotally connected by pivot pins 37 to the rear portion of support brackets 17b. The rear end of each upstanding support member 17a is pivotally connected to the support member 34 adjacent thereby by a pivot pin 38. The other elongated support members 34 thus support the rear ends of the support brackets 17a whereby the elongated support members 34 are adapted for pivotal movement relative to the stair members 27 as the elongated support members 19 and 34 move to various angular positions relative to the pier 10 and the supporting structure 32. Accordingly, the stair members 27 remain in a horizontal position parallel to each other and parallel to the stair members 21 and 33 as the pier is raised or lowered to various positions as the water level varies.

Secured rigidly to the upper surface of each elongated support member 19 is an elongated, upstanding hand rail 39 which extends from a point above the supporting structure 32 to a position adjacent the deck 11, as shown in FIG. 1.

From the foregoing description, the operation of my improved pier and stairway assembly will be readily understood. With the lower end of the elongated support members 19 and 34 pivotally connected to the upstanding brackets 17 carried by the deck 11 and the upper ends thereof pivotally connected to the upstanding sup-

port members 17b carried by the supporting structure 32, the support members 19 and 34 are adapted for angular movement relative to the pier and the supporting structure 32 as the pier 10 moves to various elevations in response to differentials in the level of the water supporting the pier. By pivotally connecting the forward ends of the support brackets 17a to the support member 19 and pivotally connecting the rear ends of the support brackets 17a to the elongated support members 34, the stair members 27 remain in a horizontal position parallel to each other at all times regardless of the elevation of the pier 10. Accordingly, the pier 10 is adapted to move from the solid line position shown in FIG. 1 to the dotted line position. It will be noted that while in the dotted line position, the deck 11 is at an elevation corresponding to the elevation of the uppermost stair member 33.

From the foregoing, it will be seen that I have devised an improved floating pier having a self adjusting stairway. By providing the elongated support members 19 and 34 which are pivotally connected at spaced locations to the deck 11 and to the supporting structure 32, the pier 10 is free to move to various positions while the individual stair members 27 remain in a horizontal position parallel to each other. Furthermore, by providing an upstanding handrail for the elongated, rigid support members 19, the handrail moves with the self adjusting stairway to various elevations as the water level varies.

While I have described my invention as being a self adjusting stairway assembly pivotally connected to a buoyant pier, it will be apparent that the pier may be in many forms, such as a floating barge, boat or other floating structure.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof.

What I claim is:

1. A floating pier with self adjusting stairway assembly comprising:

- a. a buoyant pier supported on and adapted for vertical movement with the surface of water in response to movement of said surface to various elevations,
- b. a lower pair of laterally spaced elongated, rigid support members,
- c. an upper pair of laterally spaced elongated, rigid support members,
- d. means pivotally connecting one end of each said rigid support member to said buoyant pier and permitting angular movement of each rigid support member relative to said buoyant pier,
- e. means pivotally connecting the other end of each said rigid support member to a stationary supporting structure and permitting angular movement of said rigid support members relative to said stationary supporting structure,
- f. parallel stair members extending horizontally between said upper and lower pairs of laterally spaced rigid support members at longitudinally spaced intervals.
- g. means pivotally connecting each end of each said stair member to the rigid support member of said lower pair of support members adjacent thereto whereby each stair member is supported by and adapted for pivotal movement between said lower pair of rigid support members.
- h. means pivotally connecting each end of each said stair member to the rigid support members of said upper pair of elongated support members adjacent thereto in generally horizontally spaced relation to the pivotal connections between said stair member and said rigid support members of said lower pair of support members to support and retain the stair members in parallel relationship to each other as said buoyant pier moves to various elevations, and
- i. an elongated, upstanding hand rail extending longitudinally the length of and secured rigidly to each said rigid support member of said upper pair of support members.

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