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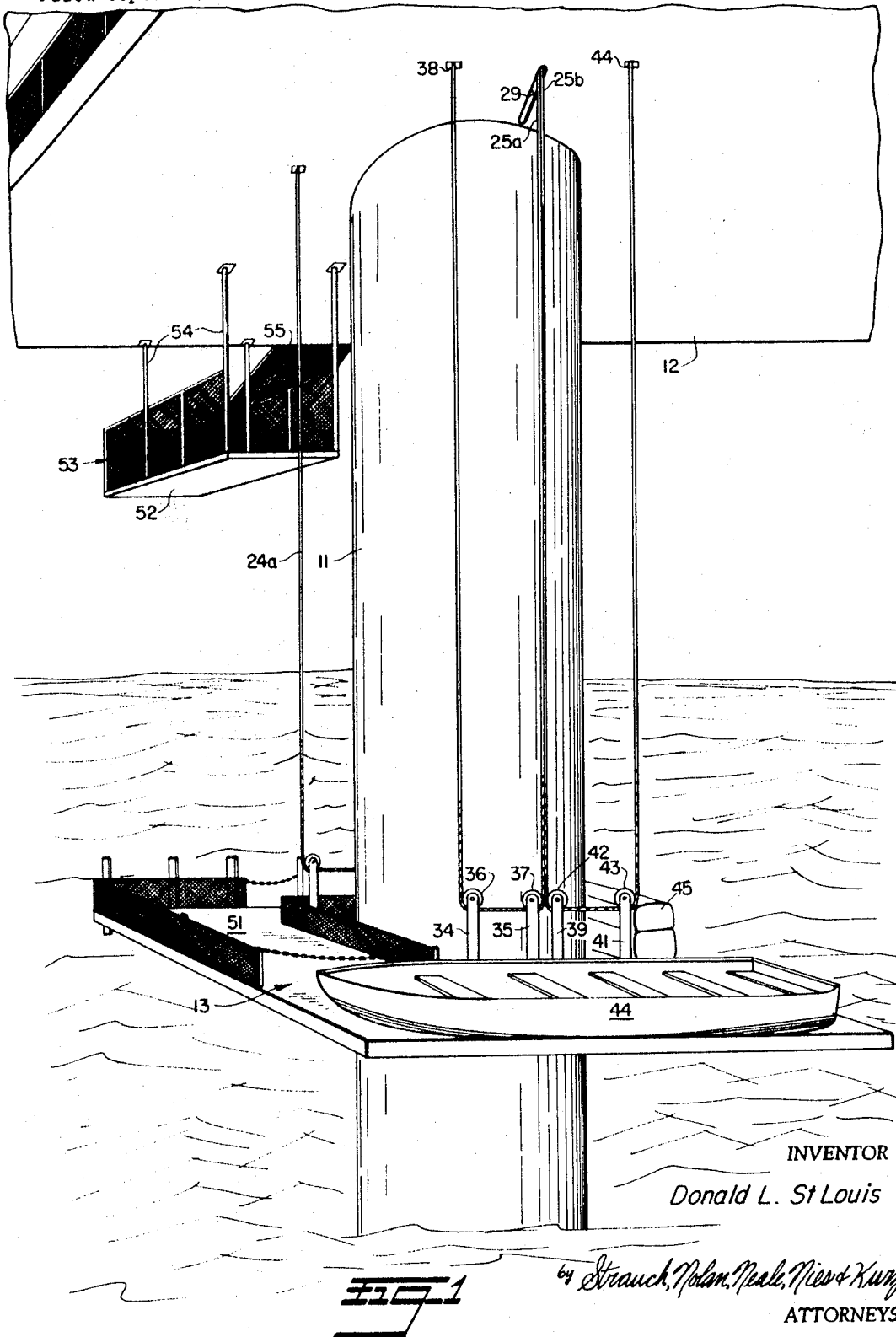
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3,463,271

OFFSHORE ELEVATOR

Filed Sept. 11, 1967

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

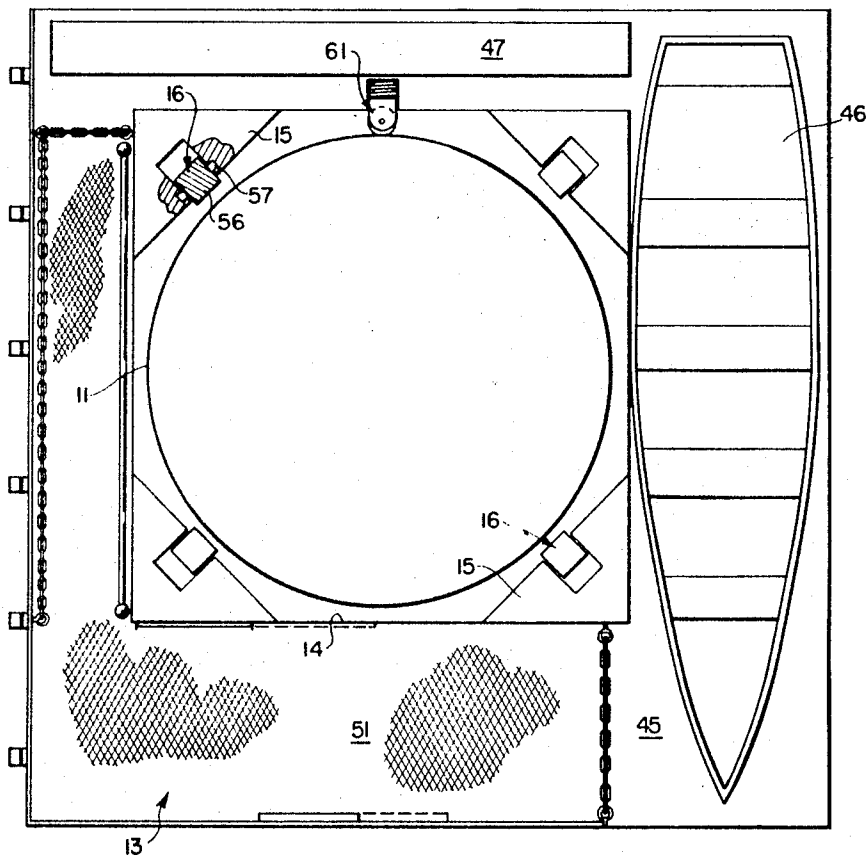


FIG. 2

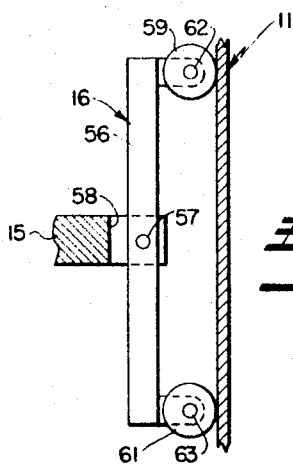


FIG. 3

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## OFFSHORE ELEVATOR

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9 Claims

### ABSTRACT OF THE DISCLOSURE

An elevator for an offshore drilling or like assembly having a vertical column on the upper end of which is a fixed operating platform comprises a lower platform surrounding the column suspended from the upper platform and raised and lowered with respect to the upper platform by a system of cables controlled from a winding drum arrangement on the upper platform. Suitable guide members on the lower platform carry rollers engaging the column, for stabilized movement. The lower platform may be dropped sufficiently to directly launch a boat and/or a life raft therefrom in case of emergency.

### HISTORY AND FEATURES OF INVENTION

Marine platforms have been proposed and built using various devices for raising and lowering men and equipment between the ocean level and a fixed upper platform. The present invention has for its major object a novel elevator arrangement, which is of particular value for emergency work, wherein the elevator surrounds and controllably ascends and descends the fixed vertical leg or column that constitutes the support or one of the supports for the fixed operational platform.

Further objects of the invention are concerned with a novel motor driven drum and cable arrangement for raising and lowering the suspended elevator platform, and with special guide and roller arrangements cooperating with the lifting and lowering mechanism for stabilized control.

### BRIEF DESCRIPTION OF DRAWINGS

FIGURE 1 is a generally perspective view showing the invention in its preferred embodiment as applied to an offshore drilling station;

FIGURE 2 is a plan view showing the lower platform or elevator deck;

FIGURE 3 is a fragmentary view mainly in section showing the guide mountings; and

FIGURE 4 is a plan view showing the upper deck and the elevator control mechanism.

### PREFERRED EMBODIMENTS

The invention is disclosed in its preferred embodiment as applied to an offshore drilling rig which comprises a central hollow column 11 that may be suitably rigidly secured at its lower end to the ocean floor. Column 11 is of a conventional type that houses drilling or like operations, for example, being about fourteen feet in diameter and extending about forty-three feet above the water level.

Secured upon the upper end of column 11 is an upper fixed horizontal platform 12. This upper platform carries all of the operational equipment. The invention contemplates a suspended lower horizontal platform 13 that surrounds the column 11 and may be readily raised or lowered along the column between the water level and the upper fixed platform. As shown in FIGURE 2, the floor of platform 13 is centrally apertured at 14 to freely extend around the column, and at the corners of the aperture are provided support brackets 15 for mounting pivoted column engaging guide members 16 which will be further described later.

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Referring to FIGURE 4, the fixed upper platform 12 supports a motor unit, usually an electric motor 17 having a speed reduction unit 18 at its output connected through a clutch 19 to a cable drum shaft 21. Shaft 21, the axis of which is horizontal, mounts two cable drums 22 and 23 on each of which are wound side by side cables 24a, 24b and 25a, 25b respectively. These cables suspend platform 13. A speed governing brake 26 is mounted on shaft 21.

Cables 25a and 25b extend over side by side idler pulleys 27a and 27b that are rotatably and axially slidably mounted on a fixed axis horizontal idler axle 28 and down a slot 29. Similarly cables 24a and 24b pass over side by side idler pulleys 31a and 31b that are rotatably and axially slidably mounted on a fixed axis horizontal idler axle 32 and down a slot 33. Axles 28 and 32 are concentric, and slots 29 and 33 are aligned on a diameter of column 11. As the cables helically wind or unwind on their respective drums the pulleys they will travel back and forth along their respective axles and the platform slots allow to and from displacement of the cables.

Any suitable pulley arrangement may be provided for the elevator lift.

The lower platform 13 carries near the inner edge of aperture 14 fixed upright posts 34 and 35 on which are mounted idler pulleys 36 and 37. Cable 25a passes down under and around these pulleys and upwardly to be fixed at 38 to an anchor plate on the upper platform. Similarly, at the same side of platform 13 are two upright posts 39 and 41 mounting idler pulleys 42 and 43, and cable 25b passes down under and around these pulleys and upwardly to be fixed to an anchor at plate 44 to the upper platform. Similarly, cables 24a and 24b at the diametrically opposite side of the column 11 extend under and around idler pulleys similarly arranged and mounted on the lower platform.

Thus when shaft 21 is rotated the winding or unwinding cables will raise or lower platform 13 in balanced relation with respect to column 11.

Platform 13 has a metal grating deck 45 and along two sides are secured a lifeboat 46 and a life raft 47. Sufficient cable length is provided that the platform 13 may be controllably lowered until it is awash and the boat or raft directly launched in case of emergency.

Platform 13 also preferably has a clear deck area 51 which, when the elevator is raised snugly underlies the floor 52 of a landing 53 suspended as by members 54 from the upper platform. A stairway 55 extends upward from the landing through a suitable opening in platform 12 to the top of that platform. Thus when the platform 13 is raised, deck area 51 directly fits under floor 52 so that men or material on the lower platform can transfer directly into floor 52.

When platform 13 is sufficiently lowered it may descend below the waterline to directly quickly launch the boat 44 or the raft 45, as in the event of an emergency. Suitable controls for the motor and brake mechanism are provided as indicated at 60 which may be operable from the lower platform. Suitable limit switches operated by contact of the lower platform may be provided in the control circuit.

FIGURE 3 shows a form of guide means at 16 wherein a vertically extending beam 56 is intermediately horizontally pivoted at 57 in a slot 58 in bracket 15 and carries upper and lower guide rollers 59 and 61 engaging the surface of column 11. Rollers 59 and 61 are freely rotatably mounted at 62 and 63 respectively, and they may be suitable pneumatic tired devices like aircraft landing wheels so that they resiliently cushion as well as guide. In the preferred embodiment as shown, there are four such guide members 16, one at each inner corner

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of the lower platform aperture, and this provides a stable guide arrangement. It is contemplated that control 60 may be on the end of a flexible control line and carried on the lower platform for such emergency operation as evacuation of the assembly during a storm or under threatening ice conditions.

As shown in FIGURE 2, one or more radially acting shock absorber cushion units 61 may be provided on the lower platform 13 for engaging the column 11.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof.

What is claimed and desired to be secured by Letters Patent is:

1. An elevator assembly for an offshore marine apparatus of the type wherein a fixed platform is mounted on a vertical support column above the normal water level comprising an apertured lower platform freely surrounding said column in spaced relation thereto, guide members on the lower platform mounted around the inner edges of the aperture and flexible engaging the column, said guide members permitting limited lateral movement of said lower platform relative to said column, and means comprising motor and drum means on the upper platform and a system of cables connecting said motor and drum means to the lower platform for suspending said lower platform from the upper platform and for controllably raising and lowering said lower platform.

2. In the elevator assembly defined in claim 1, said guide members comprising a plurality of vertically extending pivoted members on said lower platform carrying idler rollers engaging the column, said members being equally circumferentially distributed around the column.

3. In the elevator assembly defined in claim 2, said lower platform being centrally apertured and said guide members being mounted around the inner edges thereof.

4. In the elevator assembly defined in claim 1, said system of cables comprising at least one cable having one end wound on said drum means, an intermediate portion passing over pulleys carried by the lower platform and the other end anchored on said upper fixed platform.

5. In the elevator assembly defined in claim 4, said drum means having a horizontal axis, and said cable extending through said upper platform within a guide slot that is parallel to said drum axis.

6. In the elevator assembly defined in claim 4, there being a separate drum and cable arrangement connected

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to said lower platform at diametrically opposite sides of said column.

7. An elevator assembly for an off-shore marine apparatus of the type wherein a fixed platform is mounted on a vertical support column above the normal water level comprising a centrally apertured lower platform freely surrounding said column, guide members comprising a plurality of vertically extending pivoted members mounted around the inner edges of said lower platform and carrying idler rollers engaging said column, said members being equally circumferentially distributed around said column, means comprising motor and drum means on said upper platform and a system of cables comprising at least one cable having one end wound on said drum means, an intermediate portion passing over pulleys carried by said lower platform and the other end anchored on said upper fixed platform, said system of cables suspending said lower platform from said upper platform and controllably raising and lowering said lower platform.

8. In the elevator assembly defined in claim 7, said drum means having a horizontal axis, and said cable extending through said upper platform within a guide slot that is parallel to said drum axis.

9. In the elevator assembly defined in claim 7, there being a separate drum and cable arrangement connected to said lower platform at diametrically opposite sides of said column.

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61—69; 187—95