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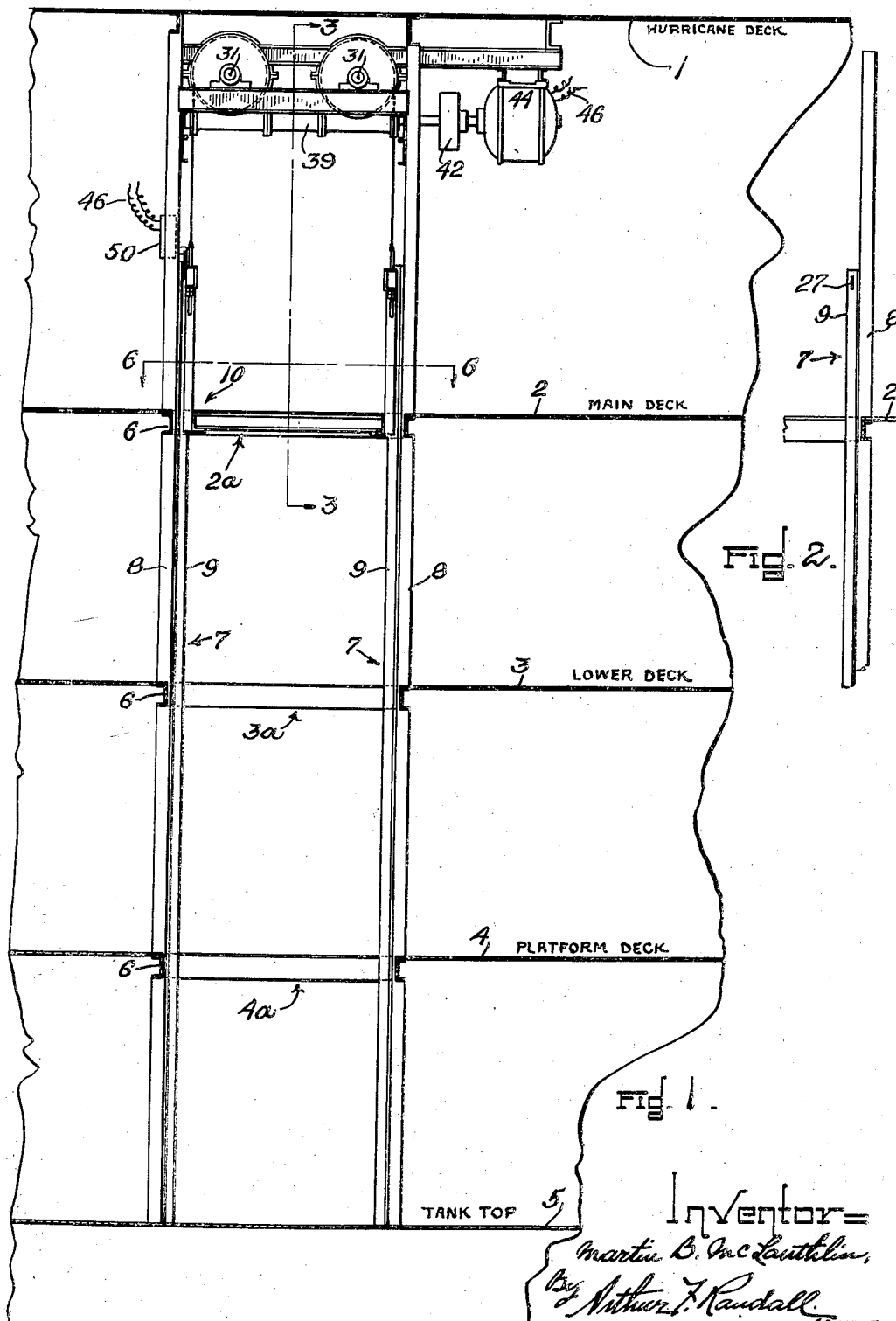
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2,181,279

SHIP CONSTRUCTION

Filed Oct. 6, 1937

4 Sheets-Sheet 1



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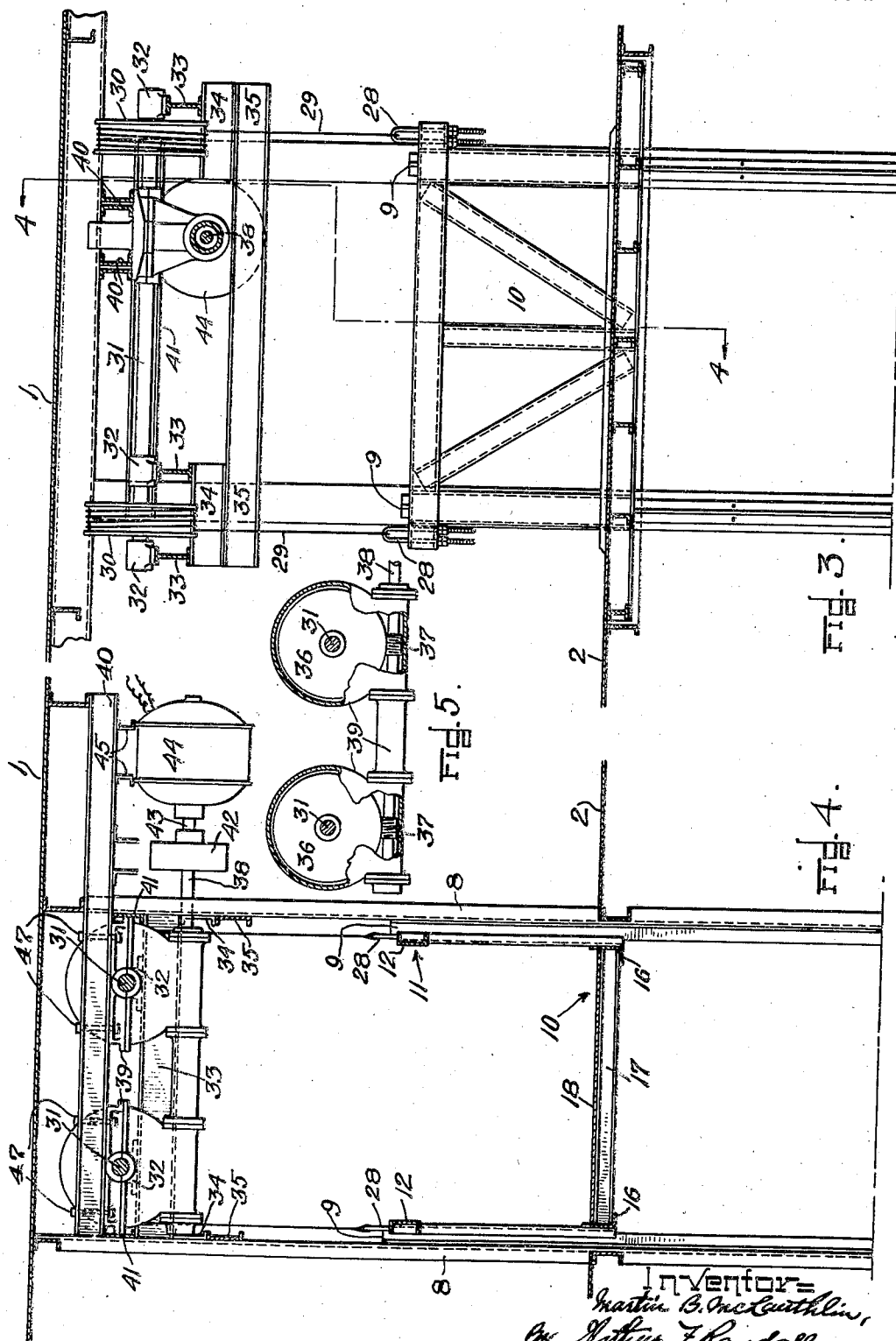
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SHIP CONSTRUCTION

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4 Sheets-Sheet 2



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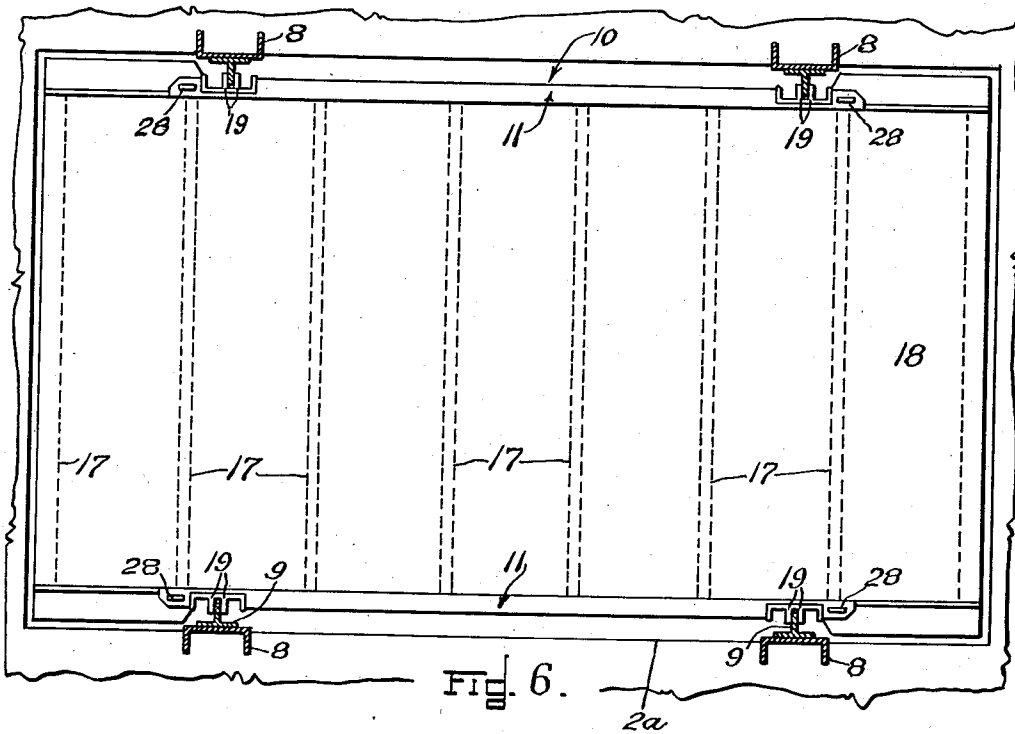
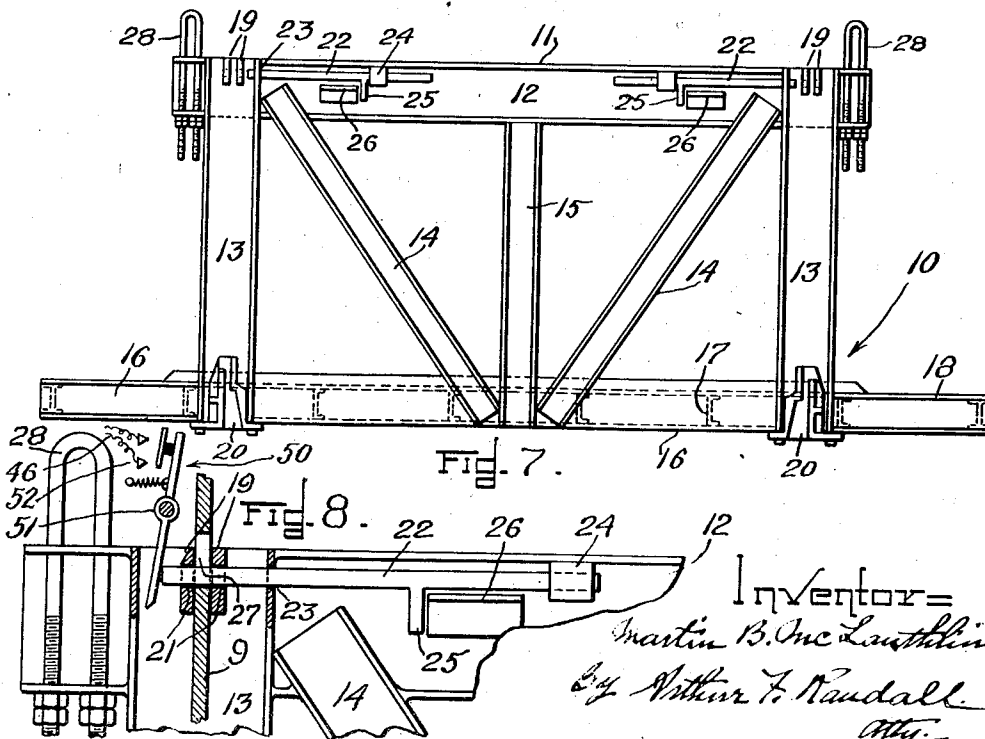
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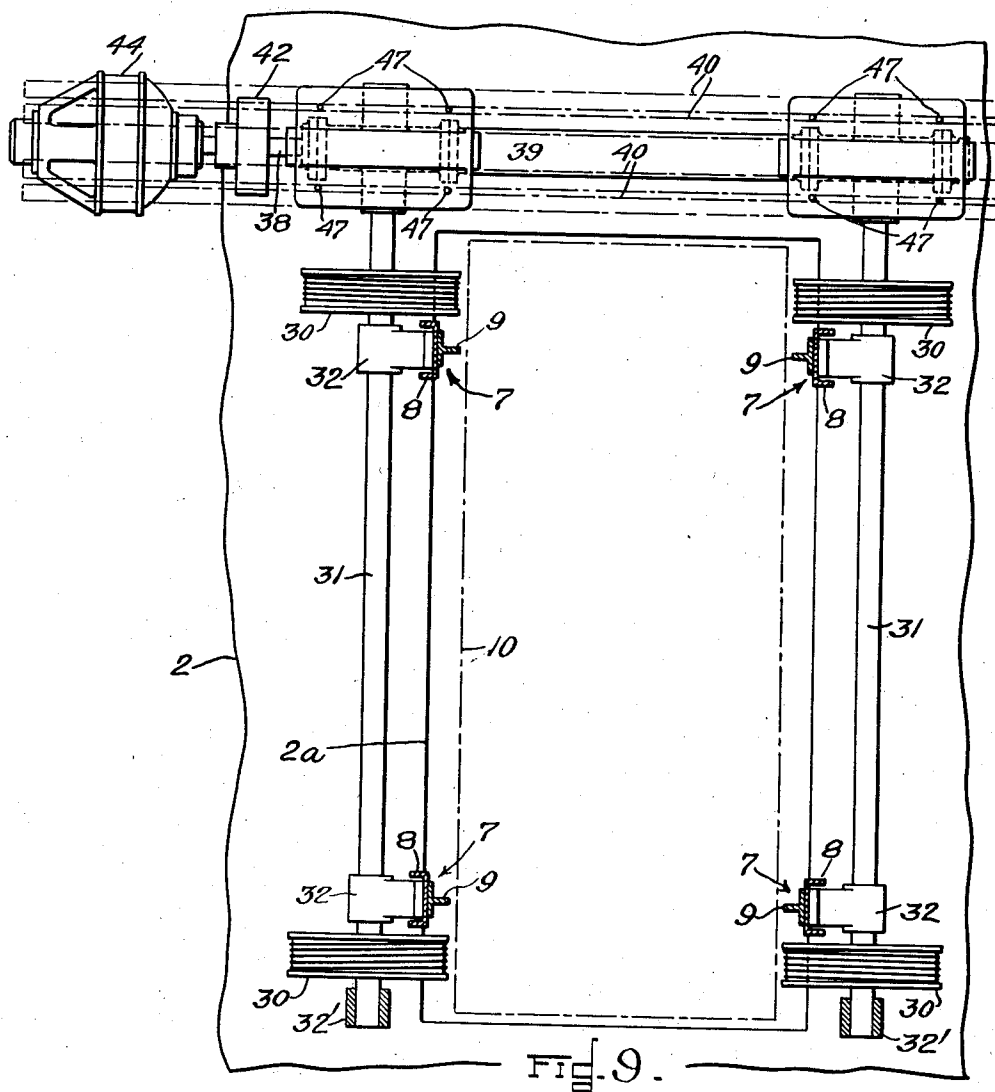
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SHIP CONSTRUCTION

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,181,279

SHIP CONSTRUCTION

Martin B. McLauthlin, Malden, Mass.

Application October 6, 1937, Serial No. 167,514

2 Claims. (Cl. 114—65)

My invention relates to the construction of ships and has particular reference to the problem of incorporating in a ship, to the best advantage, appropriate elevator mechanism by means of which freight or passengers can be delivered to and removed from the lower deck or decks of a vessel.

The invention has for its object to improve the construction of ships or vessels of that type which are provided with elevator apparatus by means of which freight or the like may be transported back and forth between an upper or main deck and the lower deck or decks of the vessel, and also to provide improved elevator apparatus for incorporation in ships or vessels of the type referred to.

Accordingly, I have provided certain improvements in ship construction and in elevator apparatus for incorporation in ships as set forth in the following description, the several novel features of the invention being separately pointed out and defined in the claims at the close thereof.

In the accompanying drawings:

Figure 1 is a vertical sectional view of a ship or vessel constructed in accordance with my invention.

Figure 2 illustrates a detail hereinafter described.

Figure 3 is a section on line 3—3 of Fig. 1.

Figure 4 is a section on line 4—4 of Fig. 3.

Figure 5 illustrates details, hereinafter referred to, relating to the car-operating apparatus presently to be described.

Figure 6 is a section on line 6—6 of Fig. 1.

Figure 7 is a side elevation of the car hereinafter referred to.

Figure 8 shows, somewhat enlarged and partly in section, a portion of the car illustrated in Fig. 7.

Figure 9 shows, in plan, an alternative form of car-operating mechanism or plant.

In the embodiment of my invention illustrated in Figs. 1 to 8 of the drawings, 1, 2, 3, 4 and 5 represent five decks of a freight or cargo-carrying ship.

The intermediate decks 2, 3 and 4 are made, respectively, with rectangular hatchways 2a, 3a and 4a, each of which is bordered by a channel frame 6.

Extending upwardly through the hatchways are four parallel vertical stanchions 8 fixedly attached to the frames 6 of the hatchways. Each stanchion 8 is a steel channel to the inner side of which is fastened a car-guiding T-rail 9 extending upwardly to a point between the decks 1 and 2. The stanchion channels 8 extend up-

wardly to the hurricane deck 1 to which they are fixedly attached.

As will be clear from Fig. 6, one flange of each T-rail 9 is perpendicularly disposed relatively to its stanchion 8 to serve as a track for a car 10. This car 10 is constructed with a pair of vertical side frames 11, one at each side of the car, and each of these frames is made up in most part from lengths of steel channel joined together by welding. Each side frame 11 comprises a horizontal top rail 12 and two end posts 13 with reinforcing braces 14 and 15 between the two end posts.

The platform of the car 10 is constructed at its opposite sides with steel angles 16, Figs. 4 and 7, to which the lower ends of the posts 13 and braces 14 and 15 are welded or otherwise fastened. The angles 16 have welded or otherwise secured to them the opposite ends of cross-bars 17 on top of which is secured a floor plate 18.

Welded or otherwise secured to the outer side of each post 13 adjacent to the upper end thereof is a pair of apertured ears or lugs 19 which slidably embrace the perpendicular flange of the proximate rail 9, while the lower end of each post 13 has fixed to it a guide shoe 20 which also slidably embraces said flange.

The lugs or ears 19 of each pair are formed with horizontally aligned apertures 21, Fig. 8, to receive one end of a horizontal bolt 22 that is slidably and rotatably mounted in bearings provided at 23 and 24 on the same side frame 11 with said lugs or ears. Each of these bolts 22 is provided intermediate its ends with a laterally projecting stem or handle 25 by means of which the bolt is manually operated. Each handle 25 co-operates with an abutment 26 on the side frame to lock the bolt in either its retracted position shown in Fig. 7 or in its projected position shown in Fig. 8.

Near its upper end the track flange of each of the four vertical T-rails 9 is formed with an aperture 27, Figs. 2 and 8, which is in horizontal alignment with the apertures 21 of one of the four pairs of lugs or ears 19 on the car when the floor of the latter is level with the main deck 2. The apertures 27 are slightly elongated to aid in bringing the apertures 21 in register therewith. It will therefore be clear that when the car is in this uppermost position the bolts 22 may all be projected forward into their operative positions where they occupy the apertures 21 of the lugs and 27 of the guide rails as shown in Fig. 8, thereby locking the car against any substantial up and down movement and also co-operating

with the lugs or cars to hold the car against lateral movement in any direction. This is a feature of advantage when the vessel is rolling or pitching in rough weather.

When the bolts 22 are in their retracted positions their handles 25 occupy positions behind the abutments 26 as shown in Fig. 7 so that they are locked in their retracted positions by the abutments. When the bolts are to be adjusted into their operative positions each is turned in its bearings to permit its handle 25 to pass around its abutment and then, after movement of the bolt endwise into its projected position, it is turned in its bearings in the opposite direction to place its handle alongside of the opposite end of the abutment as shown in Fig. 8 thereby to lock the bolt in its projected position.

Adjacent to each end of each top rail 11 of the side frames of the car is provided a shackle 23, Figs. 3, 4, 6 and 7, to which is attached one end of a wire cable 29 which extends upwardly to and around a drum 30 to which its opposite end is fastened.

The pair of drums 30 which are connected by cables 29 with one side frame of the car are fixed on a horizontal shaft 31 while the pair that are connected by cables 29 with the opposite side frame of the car are fixed on another horizontal shaft 31, said two shafts being parallel and journaled in bearings 32 on I-beams 33, Fig. 3, rigidly connected through channel sections 34 and 35 with the upper end portions of the vertical channels 8.

As shown in Fig. 5, each shaft 31 has fixed on it a worm gear 36 meshing with a worm 37, one of said worms being formed right-hand and the other left-hand, and both being fixed on a single shaft section 38 journaled in bearings provided within a housing 39 which incloses the two worms and the two worm gears as well as most of the shaft section. Housing 39 is secured by bolts 47 to the under sides of four horizontal channels 40 which in turn are secured to two horizontal channel sections 41, each of the latter being attached at its opposite ends to two of the vertical stanchion channels 8.

One end of the shaft 38 extends outside of the housing 39 and is connected through a flexible coupling 42, of usual construction, with the armature shaft 43 of a reversible electric motor 44 so that shaft section 38 serves as an extension of the armature shaft. The frame of motor 44 is secured to short channel sections 45 which in turn are fixed in position against the under sides of the four channels 40 outside of the group of four vertical stanchion channels 8, as will be clear from Figs. 1, 3, 4 and 9.

The circuit of motor 44 is provided with the usual operating switches, not shown, through which the motor is started, stopped and reversed. Also, safety devices, not shown, may be provided as usual upon the car.

A special and distinctive characteristic of the above described ship construction is that the power plant or mechanism by which the car is operated, including the motor, is in its entirety disposed between the two uppermost decks of the series, and in close proximity to the under side of the top deck, with the result that when, as in the present case, said top deck is the hurricane deck and the next deck below is the main deck of the vessel, the important and novel advantage is present that both of said decks are left free and clear for traffic or other use and the car-

operating mechanism is shielded and protected from the weather.

Heretofore, at least part but in most cases all of the mechanism of the power plant by which the car was operated has been mounted upon the top side of the main deck with the result that it reduced the capacity of said deck and materially obstructed traffic thereon. In the above described construction the power plant is supported independently of the decks of the vessel by stanchions 8 and is disposed between the two uppermost decks but in an elevated position relatively to the lower of said two decks so that the latter is free and clear and available for use.

Fig. 9 illustrates an alternative arrangement of the parts of the power plant wherein the two shafts 31, their drums 30, the shaft 38 and the housing 39 with its contents, are all disposed outside of the group of stanchions 8, whereas in the construction illustrated in Figs. 1 to 8, inclusive, these parts are all disposed within said group of stanchions. The advantage to the latter arrangement is that the power plant is smaller and more compact than that of Fig. 9, while the construction of said Fig. 9 has the advantage that when the two decks between which the mechanism is located are comparatively close together and head room is scant the disposition of the parts outside of the group of stanchions, as in Fig. 9, leaves more head room over the car when the latter is at the upper deck than would be the case with the other arrangement shown in Fig. 1. Also the parts are more accessible for attention.

In Fig. 9 two of the shaft-supporting bearings 32 of each shaft 31 are provided on the outer sides of the vertical stanchions 8 and the third bearing may be provided by a hanger 32' depending from the deck above. Also, in this Fig. 9 the bolts which secure the housing 39 to the channels 40 are shown at 47.

A distinct advantage to the above described constructions is that the employment of leading sheaves which were essential with the constructions heretofore employed is entirely obviated, the car being direct connected by the cables 29 which extend in straight lines from the car to the raising and lowering mechanism.

The circuit 46 of motor 44 as shown in Figs. 1 and 8 includes a switch 50 mounted upon one of the stanchions 8 and this switch, shown more or less diagrammatically in Fig. 8, includes a pivotally supported contact member 51 carrying a bridge piece co-operatively associated with a pair of fixed contacts 52. While the elevator apparatus is in use a spring shown in Fig. 8 normally holds the movable contact member 51 in position to maintain the motor circuit 46 closed at 52. When the car occupies a position opposite the main deck 2 and it is locked in that position by means of the bolts 22, one of the latter when thrown forward into locking position as shown in Fig. 8 displaces the contact member 51 as shown so as to open the motor circuit at 52 thus rendering the motor inoperative so long as the car is locked in its uppermost position. It will be understood that when the car is raised to its uppermost position opposite the main deck 2 the bolt 22 shown in Fig. 8 is brought into alinement with one of the slots 27 opposite which latter the member 51 is supported by the stanchion 8 on which it is mounted. Therefore, when the bolt 22 shown in Fig. 8 is projected forwardly to lock the car it also automatically opens the circuit of the motor 44.

What I claim is:

1. A vessel of the class described comprising a top deck; a bottom deck; an intermediate deck made with a hatchway; a frame bordering the hatchway and secured to the deck thereof; a
5 plurality of vertical stanchions disposed within said hatchway and extending from the top deck to the bottom deck, the opposite ends of said stanchions being connected with said top and
10 bottom decks, respectively, and the intermediate portions thereof being within and connected with said frame so as to support the latter and its deck; a car slidably mounted between and guided by said stanchions, and a self-contained car-
15 operating power plant disposed in its entirety between the two uppermost decks and supported by said stanchions in close proximity to said top deck outside of the path of traffic on both of said decks, said plant comprising a reversible elec-
20 tric motor, two worms mounted on an extension of the armature shaft of said motor, two relatively parallel horizontal shafts each provided with a worm gear meshing with one of said worms, drums mounted on said shaft directly
25 above said hatchway and cables extending directly from said drums to said car by which the latter is raised and lowered when said drums are rotated.

2. A vessel of the class described comprising

a top deck; a bottom deck; an intermediate deck made with a hatchway; a frame bordering the hatchway and secured to the deck thereof; a plurality of vertical stanchions disposed within
5 said hatchway and extending from the top deck to the bottom deck, the opposite ends of said stanchions being connected with said top and bottom decks, respectively, and the intermediate portions thereof being within and connected with
10 said frame so as to support the latter and its deck; a car slidably mounted between and guided by said stanchions, and a self-contained car-operating power plant disposed in its entirety
15 between the two uppermost decks and supported by said stanchions in close proximity to said top deck outside of the path of traffic on both of said decks, said plant comprising a reversible
20 electric motor having an armature shaft; a shaft extension for said armature shaft, a flexible coupling connecting said two shafts, two worms mounted on said shaft extension, two relatively
25 parallel horizontal shafts each provided with a worm gear meshing with one of said worms, drums mounted on said shafts directly above said hatchway, and cables extending directly from said drums to said car by which the latter is raised and lowered when said drums are rotated

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