

Dec. 27, 1938.

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2,141,180

SHIP

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3 Sheets—Sheet 1

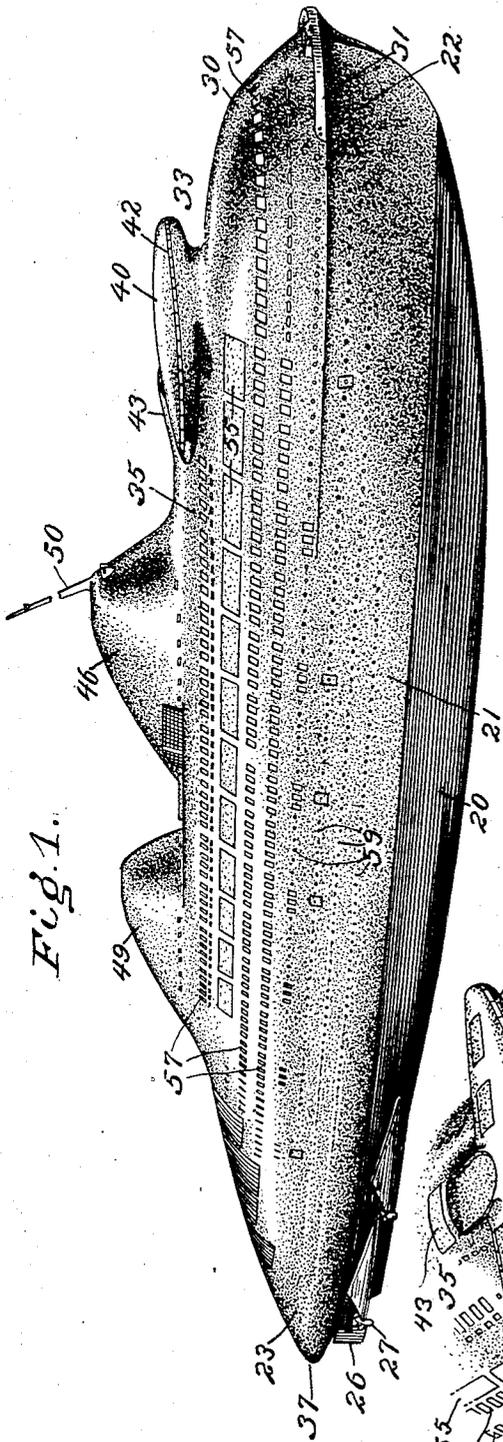


Fig. 1.

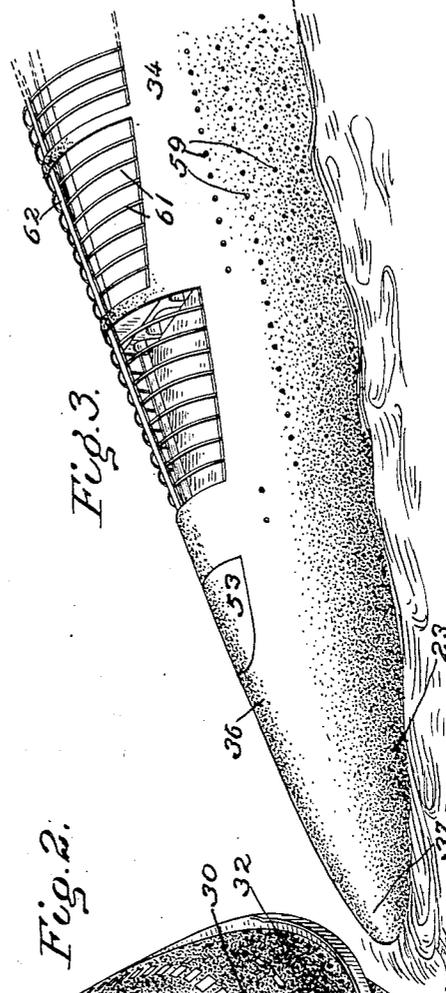


Fig. 2.

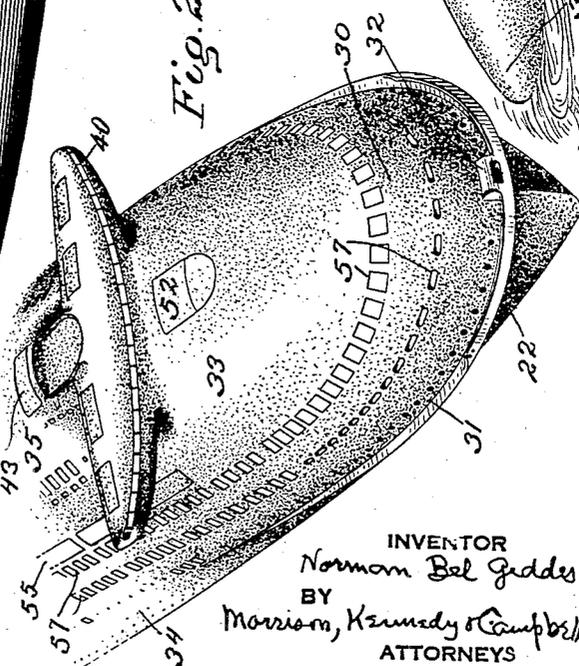


Fig. 3.

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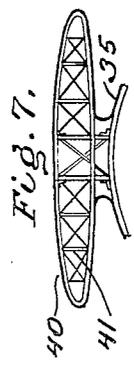
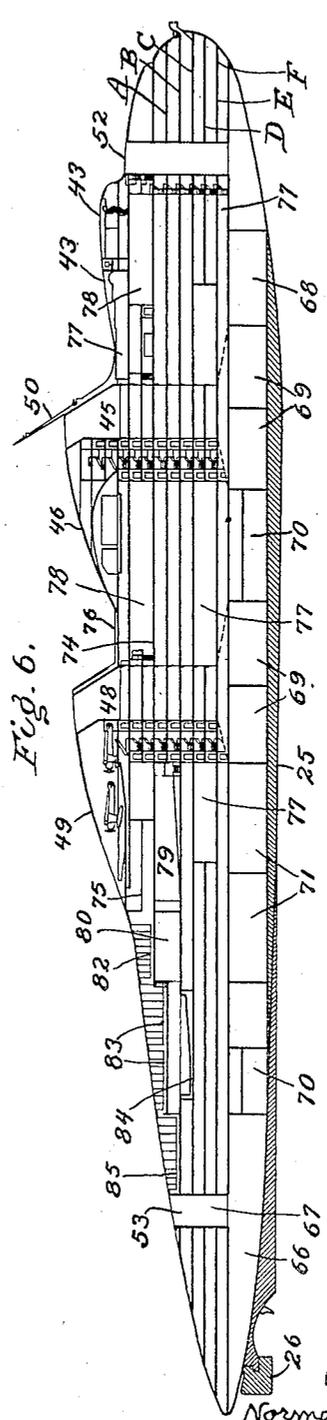
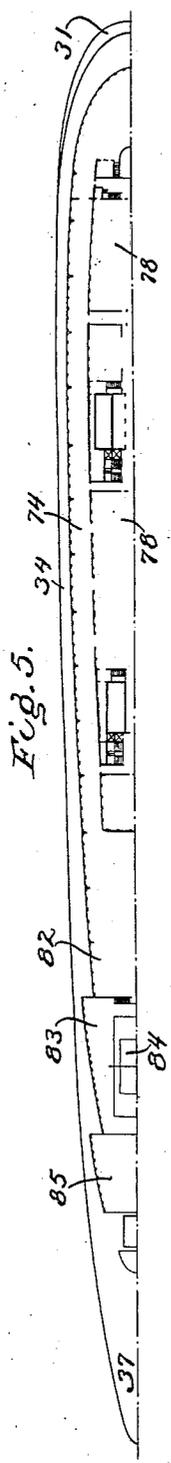
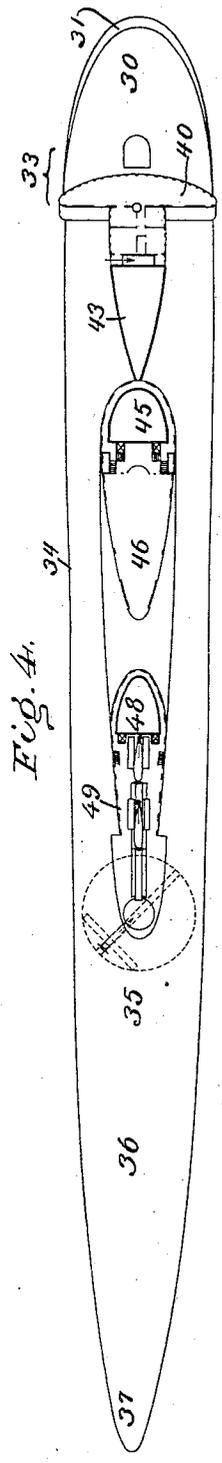
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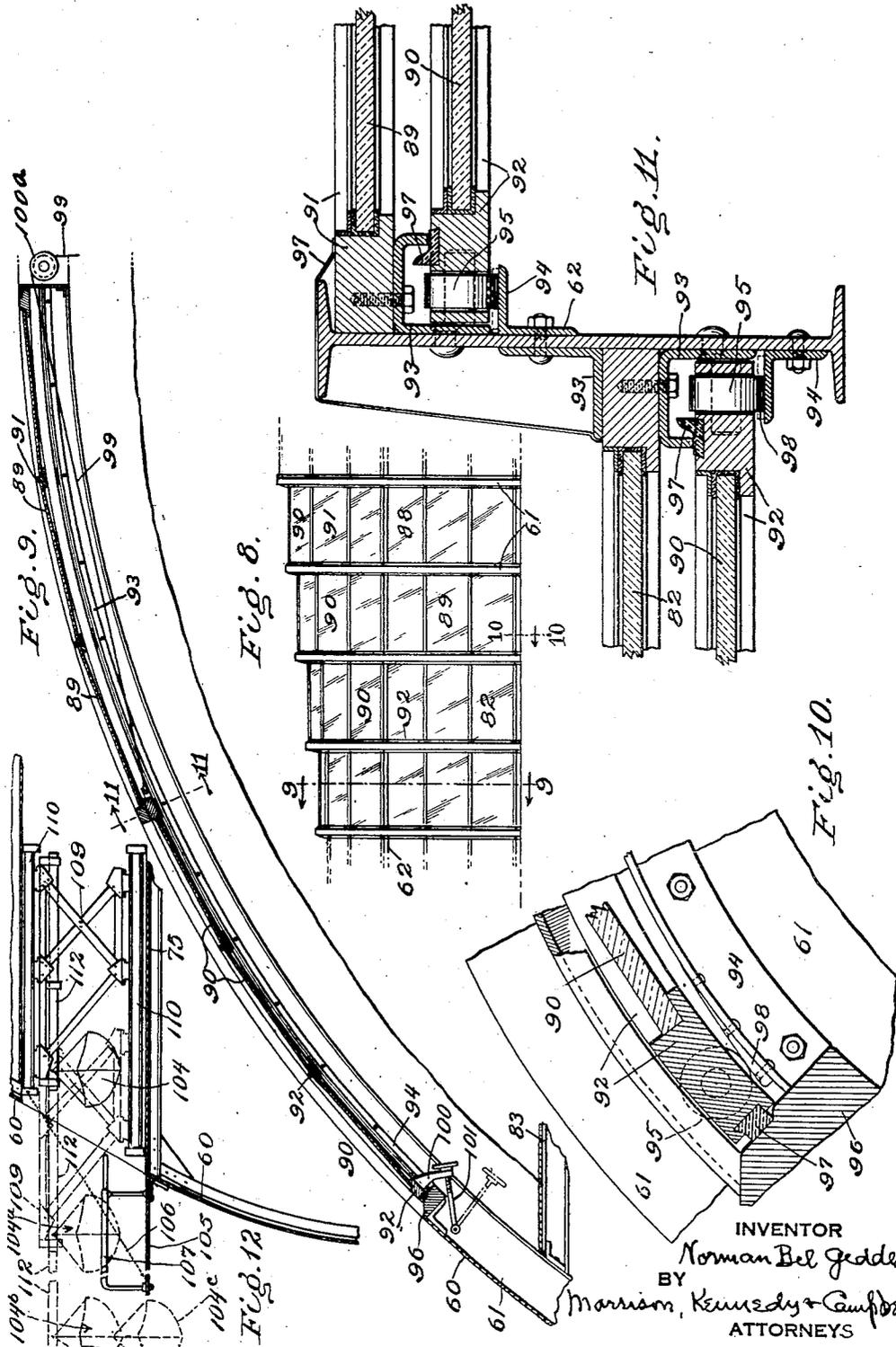
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2 Claims. (Cl. 114—0.5)

This invention relates to ships, and has to do more particularly with the structure or architecture of ocean-going steamships. The improvements herein claimed have been in part disclosed in my book *Horizons* published in November 1932, and in my design Patent No. 91,579 of February 20, 1934 for Boat. My Patent No. 1,958,040 of May 8, 1934 for Boat launching and stowing apparatus shows certain elements herein embodied in new combinations.

The general object of the present invention is to improve the structural shape and other features of structure and operation of ocean-going ships, particularly with respect to efficiency and economy of performance and the attaining of better speeds with less driving power. A particular object is to afford the structural redesign of a ship to offer minimum resistance to progress, not only as to the travel of the hull through water but as to the travel of the superstructure through air; a moderate increase in rate of speed or a substantial saving in fuel for a given speed constituting a highly important factor in ocean-going travel.

A further object refers to the reduction of cost of building a ship of given capacity, and a reduction of the weight of the ship, affording relatively increased cargo tonnage. Additional objects are to provide convertibility of certain decks by which they can be opened or closed according to weather conditions; and to provide improved means for accommodating and operating life boats without impairing the other objects. Further objects and advantages will be hereinafter further explained or be apparent to those conversant with the subject. To the attainment of the various objects and advantages mentioned the present invention consists in the novel ship and the novel features of construction, design, arrangement and combination herein illustrated or described.

In the accompanying drawings Figure 1 is a general exterior perspective view of a ship embodying the present invention.

Fig. 2 is a partial perspective view looking at a downward incline toward the bow and bringing out certain details of structure and contour.

Fig. 3 is a perspective view of the after part of the ship, in this case shown afloat.

Fig. 4 is a top plan view of the ship shown in Figs. 1-3.

Fig. 5 is a plan view taken at the level of the promenade deck.

Fig. 6 is a longitudinal central section view.

Fig. 7 is a transverse section through the navigator's bridge indicating its cantilever structure.

Fig. 8 on a larger scale than Fig. 6 is a side elevation view of part of the ship's skin or shell above one or more of the after decks, where the structure is convertible for opening or closing such decks.

Fig. 9 is a transverse section view taken on the section line 9-9 of Fig. 8.

Fig. 10 on an enlarged scale is a transverse section taken on the line 10-10 of Fig. 8.

Fig. 11 is a longitudinal section view taken on the broken line 11-11 of Fig. 9.

Fig. 12 is a transverse section of the ship at one side of the boat deck, showing the means for accommodating and launching life boats.

Referring first to the general structural shape or contour of the ship, there is shown a hull comprising a normally submerged portion 20 and a portion 21 above water, this hull constructed of an efficient design such as the so-called wave-line type of hull, not herein claimed except in combination with the superstructure features. The hull has a well rounded bow 22 and a tapering stern 23. At the bottom is a keel 25, and submerged at the rear a rudder 26, with driving propellers 27 conventionally shown.

Combined with such hull is the superstructure hereof comprising a convexly rounded or domed nose or bow end 30, which may be described as ellipsoidal or spheroidal in form and generally complementary to the rounded bow of the hull below. There is shown a narrow outstanding walk 31 commencing at the extreme nose between the hull and superstructure and extending around at both sides to a substantial distance rearward, and to which access may be had by way of a passage and housing 32 at the extreme bow.

The greatest cross sectional dimension of the superstructure is well forward, being shown at about the point 33, a fraction of the length of the ship from the extreme bow, and from this maximum section the sides 34 and the top 35 taper rearwardly, the entire aft end 36 of the ship being progressively tapered, in conjunction with the contour of the hull, and the two shaped smoothly to terminate in an extreme tip or tail 37.

With this general streamline structure are harmonized all other exposed features of the ship. Thus the navigator's bridge 40 is of the general shape of an aerofoil or monoplane wing, with fore-and-aft streamlined section, and set upon the top of the superstructure near to the point

33 of maximum transverse section. The bridge has an interior cantilever structure 41 to avoid exterior struts, and its skin is provided with a complete series of observation windows 42. Extending rearwardly behind the center of the bridge is a tapered protrusion 43 by which the bridge contour is blended at this point with that of the superstructure.

The forward stack 45 is surrounded by a much enlarged housing 46 and the second or rear stack 48 is similarly enclosed in a housing 49, the ample space between the housing walls and stacks being utilized for purposes of ship operation or convenience. A raked lookout mast 50 is combined with the forward stack housing.

Substantially all other usually exposed features are preferably enclosed within the contour described, thus minimizing protrusions offering resistance and creating retarding eddies. Thus, fore and aft hatchways are normally smoothly closed by hatches 52 and 53. The life boats and launching apparatus are enclosed inside the boat deck, as will be further described, and the exits or doorways for the boats are normally smoothly closed by hinged doors or panels 55. At various decks are smoothly mounted square windows 57 and round port holes 59.

As is brought out particularly by Figs. 1 to 3 the structural outline of the ship constitutes an organized entirety. The contours of the hull, the superstructure, the bridge and the stack housings are not merely individually streamlined but are mutually harmonized, their outlines merging one into the other in a manner minimizing head resistance and rear eddies.

The enclosing shell or skin of the ship is composed of plates mounted upon and maintained in position by a system of interior structural bracing elements. Thus immediately within the skin 60 is a system of open elliptical frames or bulkheads 61, in the nature of large rings or hoops extending both over and under the water line and supporting the skin both of the superstructure and hull, and these cross frames or laterals 61 are interconnected by longitudinals 62 certain of which are indicated in Figs. 3, 8 and 11. The skin 60 also is naturally a strength element, and may be composed of metal panels or plates fixed to each other and to the frame by welding or riveting, except that at certain places above certain decks, as shown in Figs. 1, 3 and 6, the usual metal plates are omitted to afford decks, preferably at the after part of the ship, which may be permanently open as indicated in Fig. 3, between the frame members or may be convertible between open and closed condition, for example by sliding panel or window arrangements as indicated in Figs. 8 to 11.

The balance of the interior ship structure consists mainly of a system of decks, as will be described more in detail, these being rigidly connected with the ship frame and skin, and being herein characterized as being substantially level or horizontal, longitudinally from stem to stern as well as laterally from side to side, as distinguished from the usual deck structure crowned laterally and curved upwardly toward each end of the vessel. Greater facility of interior architecture and arrangement and greater comfort result. The system of parallel decks throughout further affords substantial economy of structure in that the structural elements may be standardized, the windows of uniformly square shape and size, and similar constructional features of regular

rather than individual character at different parts of the ship.

In a modern ship the skin may be generally closed and the decks thus housed in as disclosed in view of the increasing adoption of air conditioning and various other modern comforts and necessities are to be understood and will not be enumerated.

To outline the possibilities of deck arrangements and interior spaces, as illustratively shown in Figs. 4-6, directly above the keel are cargo spaces 66 with hatchways 67 above them, closed by hatches 52 and 53; a space 68 to contain fresh water; boiler rooms 69; fuel oil spaces 70; and turbine rooms 71.

Thereabove, as indicated at the front of Fig. 6, are the successive decks A, B, C, D, E and F; and above deck A is promenade deck 74 and at still higher levels boat deck 75 and open sun deck 76.

Dining and analogous rooms or cabins 77 are indicated at convenient points, and lounges or similar rooms 78; with a theater 79 aft of the center of the ship and therebehind a gymnasium 80.

Beneath the open or openable part of the superstructure skin, as shown in Figs. 1, 3, 5 and 6 may be accommodated, at various levels, a game space or floor 82, and aft thereof tennis or other play courts 83, between and below which is a swimming pool 84, and aft thereof an open sun space or beach 85. All of these may be housed in in inclement weather under the glass panels to be described, while in fair weather the skin may be converted for open exposure of these spaces.

For converting the game and recreation spaces from closed to open condition and vice versa there is shown a system of glass panels 89 and 90 between the transverse frames 61, adapted to be disposed of by removal, or by sliding or folding them away when desired. Details of an illustrative structure for this purpose are shown in Figs. 8 to 11 wherein the upper tiers of glass panels 89 are mounted in fixed sashes 91, as this central overhead part may be permanently closed, admitting light however through the glass panels. The panels 90 of the lower tiers are mounted in sashes 92 adapted to be shifted to open completely the deck space therebeneath, as will be described. Mounted rigidly on the transverse frame members 61 are angle irons 93 giving fixed support to the sashes 91 of the upper tier. Angle irons 94 thereunder give sliding or rolling support for the sashes 92 of the lower tier, of which all of the sashes in each transverse row may be connected to slide in unison upon two angle irons 94 as a track. Each of the sashes 92 is shown provided with rollers 95 running on the angle irons 94.

In Figs. 8 to 11 the lower tiers of the panels are shown in their lowered or closed position, it being understood that they can be slid or rolled up under the panels of the upper tier, to open these deck spaces to atmospheric air. As each of the rows of lower panels is moved into closed position, as shown, the lowermost sash 92 thereof comes in contact with a stop block or beam 96 fixedly attached to the skin 60 of the superstructure. To improve water tightness of the described structure various rubber packings and shields 97 may be employed. The lower end of each angle iron 94 is shown as provided with a wedge piece 98 at its upper side, so that as the lower sashes come into closed position they will be wedged upward tightly against the angle irons 93 above them, for greater tightness against the

weather. To lock the panels in their lowered position the lowermost sash 92 of each series is shown provided with a forked projection 100^a, and with this is detachably connected a swinging bolt 101, the locking nut or head of which bears upon the fork and may be drawn tight. The operation of the shiftable sashes or panels to convert this part of the superstructure may be effected in any desirable manner, as by motors, but being conventionally illustrated by a chain 93 attached to the uppermost shiftable panel and passing around a pulley 100 to a convenient operating point.

Coming now to the life boat launching apparatus, this is diagrammatically indicated in Fig. 12 where each life boat 104 is shown accommodated in a compartment at the level of the boat deck 75. This compartment is normally closed by an exterior panel 105 in the nature of a door, which is hinged at its lower edge so as to swing out and down, with a cable 106 or other means to stop its swinging in the position shown wherein the panel is substantially flush with the boat deck and constitutes a gangplank, having a hand rail 107, by which passengers may walk out to a point well removed from the skin of the ship and there enter the life boat in the position 104^a.

Within the compartment is shown a sliding davit 108 of cantilever construction, which may be substantially as illustrated in my said Patent 1,958,040, this frame sliding bodily outwardly and inwardly on upper and lower tracks 110. When moved outwardly the upper outer corner of the sliding frame issues to the position shown in dotted lines, corresponding to the dotted line position in said patent, the boat 104 being thereupon suspended in the position 104^a, in the present case above the gangway 105.

In order to extend the outward movement of the boat to a point beyond the gangway an extension frame or bar 112 may be used, sliding or telescoping in the davit 108, this telescoping member being shown in dotted lines as thrust fully outward, bringing out the life boat to the position 104^b. The boat may be provided with a bail or suspension cable 114 to which is attached the lowering cable 115, and by paying this out by any ordinary cable control mechanism the boat may be lowered to position 104^c flush with the gangway, permitting passengers safely to enter the boat before its subsequent final lowering and launching at water level.

It is proposed to provide an alarm system for the ship whereby in times of emergency not only will alarms be sounded to warn passengers of danger, but automatically access will be given to the boat compartments, otherwise shut off from access, power being at the same time applied to cause the opening of the hinged panels 105, the sliding out of each davit 108 and the lowering of the life boat to position 104^c flush with the boat deck and gangway.

Many features and details of construction, design, arrangement and combination may be variously modified within the principles of the invention; therefore it is not desired to limit the in-

vention to such features except to the extent set forth in the appended claims.

I claim:

1. In an ocean-going ship of the class having a system of interior decks within the enclosed hull and superstructure, and the enclosed superstructure of which has a substantially narrowed beam at such decks as are above the level of widest beam by reason of convergence of the ship sides above such level; a means for launching and loading a small boat accommodated in a compartment between two decks both substantially above the level of widest beam of the ship; characterized by a skin-panel normally closing the launching exit of the compartment, said panel being fitted at the lower of such two decks to swing out and down substantially flush with such lower deck, and having means for there holding it, thereby to operate as a gangway projecting beyond the point of widest beam well above water level for loading said small boat, and davit mechanism between said two decks comprising a frame having upper and lower members and bodily slidable upon the lower of such two decks transversely in said compartment and having its upper members projecting outwardly well beyond its lower members whereby to project beyond the point of widest beam of the ship when the lower members of said davit frame are slid substantially to the edge of such lower deck, thereby to carry the small boat outwardly from the compartment through such exit and above and beyond said panel-gangway and beyond the widest beam of the ship, and adapted thereupon to lower the small boat into loading relation to the gangway and thence to the water.

2. A ship having a system of interior decks within an enclosed hull and enclosed superstructure, and having a means for launching and loading a small boat accommodated in a compartment between two decks both substantially above the water level; said means characterized by a skin-panel normally closing the launching exit of the compartment, said panel being hinged at the lower of such two decks to swing out and down substantially flush with such lower deck and having means for there holding it, thereby to operate as a gangway projecting beyond the point of widest beam well above water level for loading or unloading said small boat, and davit mechanism normally accommodated between said two decks comprising a davit frame having upper and lower members and bodily slidable transversely in said compartment and having such upper members projecting outwardly well beyond such lower members whereby to project substantially beyond the point of widest beam of the ship when the lower members of said davit frame are slid substantially to the edge of such lower deck, thereby to carry the small boat outwardly from the compartment through such exit and above and beyond the open panel-gangway and beyond the widest beam of the ship, whereby the small boat is adapted thereupon to be lowered into loading relation to the gangway and thence to the water.

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