

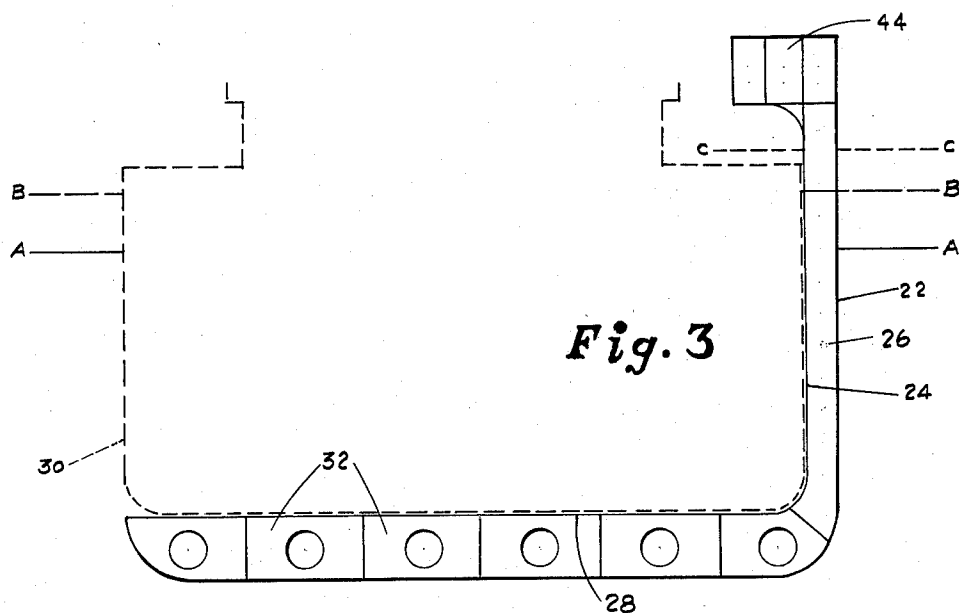
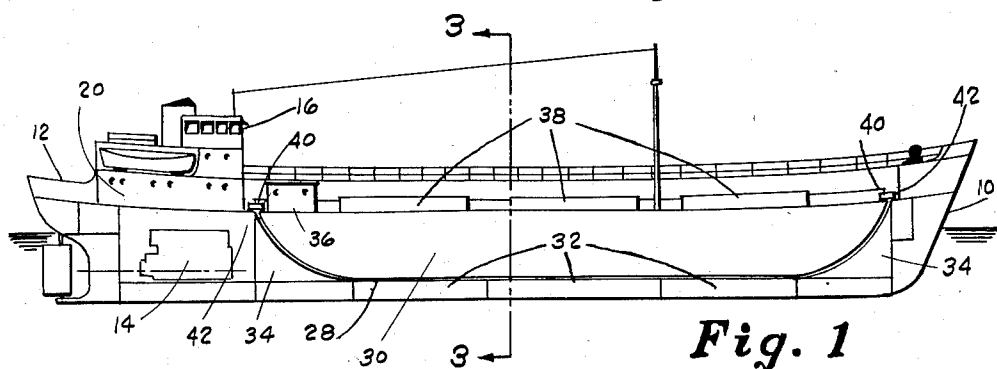
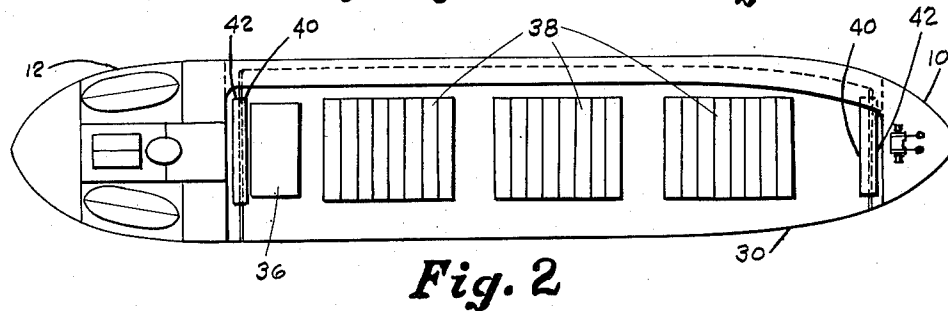
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P. THIEL, JR

2,369,265

SECTIONAL SHIP

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INVENTOR.  
PHILIP THIEL, JR.  
BY

*Edward H. Kent*

## UNITED STATES PATENT OFFICE

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## SECTIONAL SHIP

Philip Thiel, Jr., Ipswich, Mass.

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9 Claims. (Cl. 114-77)

This invention relates to sectional ships having a cargo carrying section separable from an engine unit.

An object of the invention is to provide such a ship in which the cargo carrying section comprises one or more barges which may be quickly and easily attached to and detached from the engine unit so that, by ready interchange of loaded cargo sections, the time and cost of loading and unloading the ship are greatly reduced. A further object is to provide such a ship which, when loaded, is more seaworthy and is capable of traveling at much higher speeds than a tug and barge tow arrangement of equivalent cargo carrying capacity. Another object is to provide such a ship of which the engine unit contains propelling and navigating machinery and crew's quarters and is equipped and seaworthy for sea-going operation, with or without the barge unit.

In a preferred construction of the invention, the engine unit has the bow and stern of a conventional freighter with machinery aft, but is provided with novel structure amidships for receiving the barge section. In this structure the side plating and longitudinal deck strength members of the ship between bow and stern are concentrated on one side of the ship forming a double wall, the two sides of which are narrowly spaced apart. This structure extends below the waterline where the inner wall merges into the upper plating of a double bottom, which plating extends to the other side of the ship and at the bow and stern also joins the inner end walls of the stern and bow portions. Thus the mid-portion of the ship is formed in substantially L-shaped cross-section providing between bow, stern and the double side wall, a recess or basin extending well below the waterline and open at one side to receive the barge. This recess extends the full width of the ship minus the thickness of the double walled hull at one side.

The engine unit has a double bottom with fuel and ballast compartments of which the latter may be flooded with sea water to sink the unit to a point at which the barge section may be freely floated laterally into or out of this recess. The barge section is shaped to fit closely in this recess and to occupy substantially its full volume so that when the barge section is in place its outer side forms in effect a hull side for the engine unit between bow and stern on the open side of the recess.

In the accompanying drawing, which illustrates a preferred embodiment of the invention:

Fig. 1 is a general side elevation of the ship, showing the cargo section in place;

Fig. 2 is a deck plan showing the assembled ship; and

Fig. 3 is a mid-ship cross-section on a larger scale on the line 3-3 of Fig. 1, with cargo section indicated by a dotted line.

In the illustrated embodiment, the bow portion 10 and stern portion 12 are of more or less conventional construction, the stern portion containing propulsion and navigating equipment, crew's quarters, etc. The engine room is indicated at 14, the navigating bridge at 16 and crew's quarters at 20. Bow and stern are connected by a double walled side having an outer wall 22 and inner wall 24 forming therebetween a narrow compartment extending above and below the water line, containing at the upper edge sufficient material for imparting the usual longitudinal strength furnished by a conventional ship's deck and ballast tanks 26.

The bow and stern are each provided with watertight end walls which, with the wall 24, merge into the upper plating 28 of the double bottom of the ship, forming therewith a watertight recess for receiving the cargo section 30. The engine unit is equipped with a double bottom having fuel and ballast tanks indicated at 32, conventional piping and pumps (not shown) being provided for filling, emptying or transferring the ballast and fuel as desired. Additional ballast tanks 34 are provided at both ends of the recess.

The cargo section is shown as a single barge 30 of more or less usual construction having watchman's quarters 36 and cargo hatches 38. The length and width of the barge are rather closely proportioned to the length and width of the receiving basin or recess of the engine unit and the plating 28 and bottom of the barge are correspondingly shaped so that the barge when in place fits closely on the plating 28 and to wall 24 and the end walls of the bow and stern portions. The side longitudinal and vertical curvature of the cargo section or barge is proportioned to substantially correspond with hull walls 22 and 24 of the engine unit so that the outer side of barge 30 when in position as shown completes the normal outline of the ship at the open side of the recess. Latching devices 40 are provided at bow and stern of the barge 30 which are engaged by corresponding devices 42 at the inner ends of the bow and stern portions of the engine unit, to lock the cargo section against vertical and sidewise movement relative to the engine unit.

In use, to separate the loaded cargo section from the assembled position shown, the latches 40, 42 are released and the ballast tanks of the engine unit are flooded to sink the ship from waterline A—A to waterline B—B, at which the barge will float in the recess, and then further to waterline C—C, at which the barge floats up from the plating 28, providing clearance. The barge is then readily moved laterally out of the open side of the recess by a tug, by dock winches or, if desired, by winches provided on the engine unit itself.

To receive a loaded cargo section or barge, the engine unit is sunk to a waterline such as C—C at which the plating 28 of the recess has a draft greater than that of the loaded barge and is therefore below the bottom of the barge which is then floated laterally into registry with the recess with the aid of a tug or winches. The engine unit is then raised by pumping out ballast tanks until the barge rests on the plating 28 and the latches are secured. The ballast tanks are then further pumped to bring the assembled loaded ship to proper seagoing draft and trim.

The ballast tanks 26 included between outer wall 22 and inner wall 24 are employed to aid in the control of trim and stability, in conjunction with the other ballast tanks.

Although the cargo section completes the ship in form when in place, it is required to furnish no part of the longitudinal strength of the ship. Adequate longitudinal strength of the ship is provided in the engine unit by the double bottom, the walls 22 and 24 and by concentrating the usual deck longitudinal strength material above the walls 22 and 24, conveniently, as shown in an enlarged space 44 which forms the bulb of a bulb-angle cross-section for the double-walled hull. The engine unit is, of course, water-tight independently of the cargo section and its ballast tanks are so disposed and proportioned that it may be made stable so that the engine unit is capable of seagoing operation without a cargo section in case it is desired to move the engine unit unloaded between ports.

While I prefer to make the cargo section a single barge sized to fit a single recess in the engine unit, it may comprise two or more barges which may be positioned end to end and received in a single recess as shown, or the recess may be compartmentized to receive them. Also, the double-walled hull structure shown at the side may instead be provided in the middle, thus forming a receiving recess at each side of the ship, but this is generally not as satisfactory because of the extreme breadth required to receive barges of normal proportions.

I claim:

1. A sectional ship comprising complementary engine unit and cargo section, said engine unit containing propulsion and navigating equipment for the ship and crew's quarters and having a hull formed with an indentation in one side to provide a recess in the side of the unit for removably receiving and supporting the cargo section, said recess having a double bottom below the waterline of the unit, said cargo section be-

ing in the form of at least one floatable cargo-carrying barge and being shaped and dimensioned to fit snugly within said recess of said engine unit substantially filling the same, said engine unit being equipped with ballast means for sinking said unit in the water so that the bottom of said recess has a draft greater than the loaded cargo section whereby the loaded cargo section may be floated into the recess and thereupon raising the unit in the water so that the cargo section rests upon the bottom of the recess, said engine unit being watertight with respect to said recess and being seaworthy with and without said cargo section.

2. A sectional ship as claimed in claim 1 wherein said recess is amidships of said engine unit and is provided with a side wall connecting bow and stern of the engine unit, said side wall formed substantially in bulb-angle cross-section with the deck longitudinal strength members concentrated in the bulb.

3. A sectional ship as claimed in claim 1 wherein said recess extends substantially beyond the longitudinal center line of the unit.

4. A sectional ship as claimed in claim 1 wherein said cargo section is a single barge.

5. A sectional ship as claimed in claim 1 wherein said engine unit and cargo section are provided with cooperative means for releasably latching the cargo section in said recess.

6. A sectional ship comprising complementary engine unit and cargo section, said engine unit containing propulsion and navigating equipment for the ship and crew's quarters and having an intermediate portion between bow and stern formed in substantially L-shaped cross-section to provide a cargo section receiving basin, open at one side of the unit, having a bottom below the waterline of the unit to support the loaded cargo section, said cargo section having the form of a floatable barge dimensioned to fit snugly within said basin with its outer side substantially closing the open side of the basin, said engine unit equipped with ballast means for sinking said unit in the water so that the bottom of said basin has a draft greater than the loaded draft of the cargo section and for raising said unit, upon floating of the cargo section into said basin, so that the cargo section is supported by the bottom of the basin, said engine unit being watertight with respect to said basin and being seaworthy with and without said cargo section.

7. A sectional ship as claimed in claim 6 wherein the basin extends transversely of the engine unit beyond the longitudinal center line of the unit.

8. A sectional ship as claimed in claim 6 wherein the longitudinal side wall of said basin is formed substantially in bulb-angle cross-section with the deck longitudinal strength structure concentrated in the bulb.

9. A sectional ship as claimed in claim 6 wherein the engine unit and cargo section are provided with cooperative means for releasably latching the cargo section in said basin.

PHILIP THIEL, JR.

## CERTIFICATE OF CORRECTION.

Patent No. 2,369,265.

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PHILIP THIEL, JR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 9, claim 1, for "recess an" read --recess and--; line 15, claim 2, for "clamed" read --claimed--; line 21, same claim, for "hulb" read --bulb--; line 27, claim 5, for "caimed" read --claimed--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of June, A. D. 1945.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.