United States Patent [19]

Garcia

[11] **3,796,176**

[45] **Mar. 12, 1974**

[54] **APPARATUS FOR AND METHOD OF CARRYING MARINE CARGO**

[76] Inventor: **Emilio C. Garcia,** 441 Gravier St., New Orleans, La. 70130

[22] Filed: **Jan. 20, 1972**

[21] Appl. No.: **222,423**

[52] **U.S. Cl.** ..... **114/43.5,** 114/77 R
[51] **Int. Cl.** **B63b 35/42**
[58] **Field of Search** ..... 114/77 R, 77 A, 43.5, 72

[56] **References Cited**

UNITED STATES PATENTS

3,556,036	1/1971	Wells	114/72
2,406,084	8/1946	Levin	114/77 R
3,508,514	4/1966	Vienna	114/77 R
2,386,650	10/1945	Bell	114/43.5
3,191,568	6/1965	Schroeder	114/43.5

FOREIGN PATENTS OR APPLICATIONS

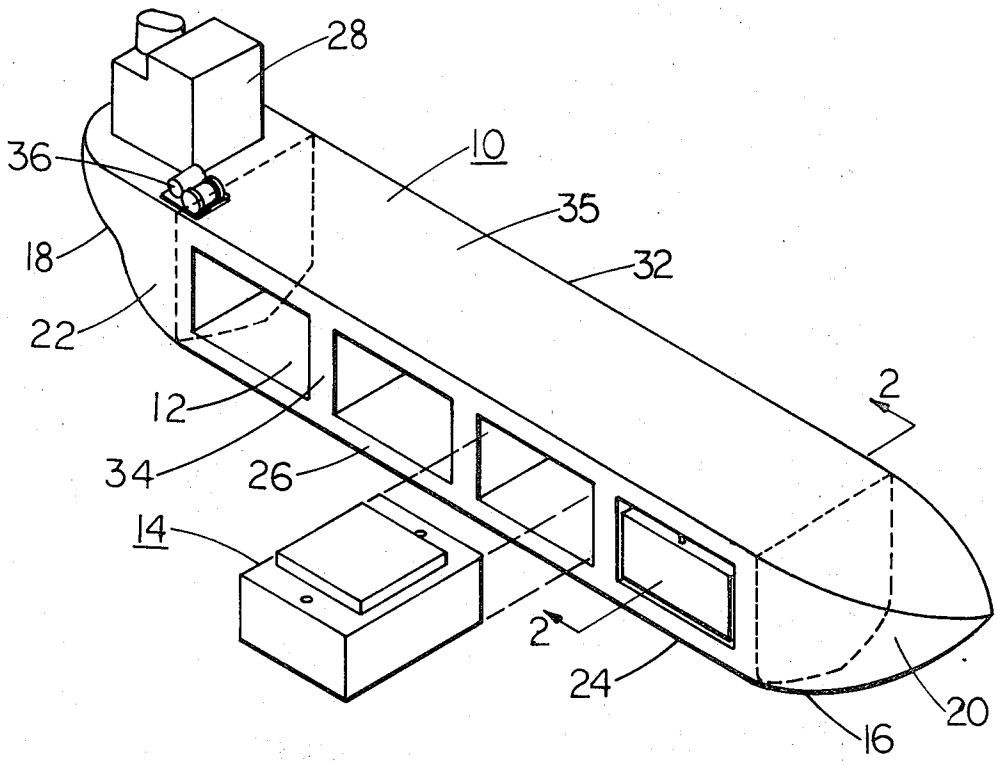
1,400,750	6/1964	France	114/43.5
741,841	2/1933	France	114/77 R

Primary Examiner—Duane A. Reger
Assistant Examiner—Galen L. Barefoot
Attorney, Agent, or Firm—James B. Lake, Jr.

[57] **ABSTRACT**

A marine vessel in which oppositely disposed ends are connected by a bottom and a crate structure therebetween. The ends and bottom define floatation spaces, and, in combination with the crate structure, define side opening cargo spaces in the interstices between longitudinal and transverse elements. And in detachable combination with the vessel, a plurality of floatable cargo modules that are complementary in size and shape, either singly or in combination, to the respective cargo spaces, to serve as lighters, then as individual holds, and as interstice closures when fastened in place in the crate structure. Propulsion machinery can be mounted in the after of the oppositely disposed ends either permanently or as a detachable propulsion module as described in my push-tow U.S. Pat. No. 3,613,628. Remotely controlled flood valves and evacuation pumps are mounted in the flotation spaces for controlling the draft of the vessel for loading and unloading the cargo modules in and out of the side opening cargo spaces by floating.

2 Claims, 4 Drawing Figures



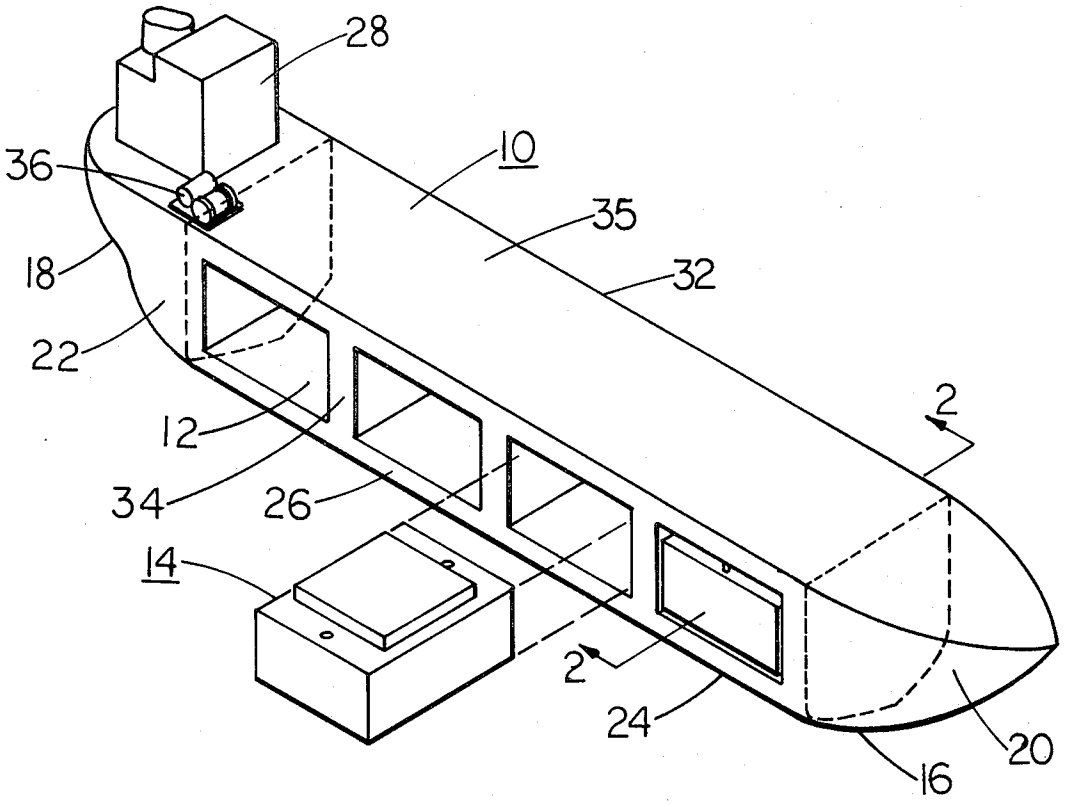


FIG. 1

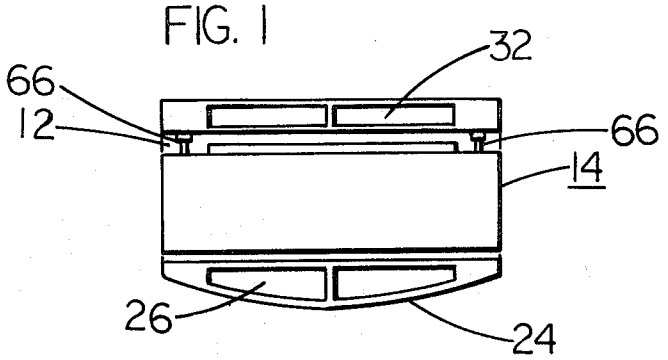


FIG. 2

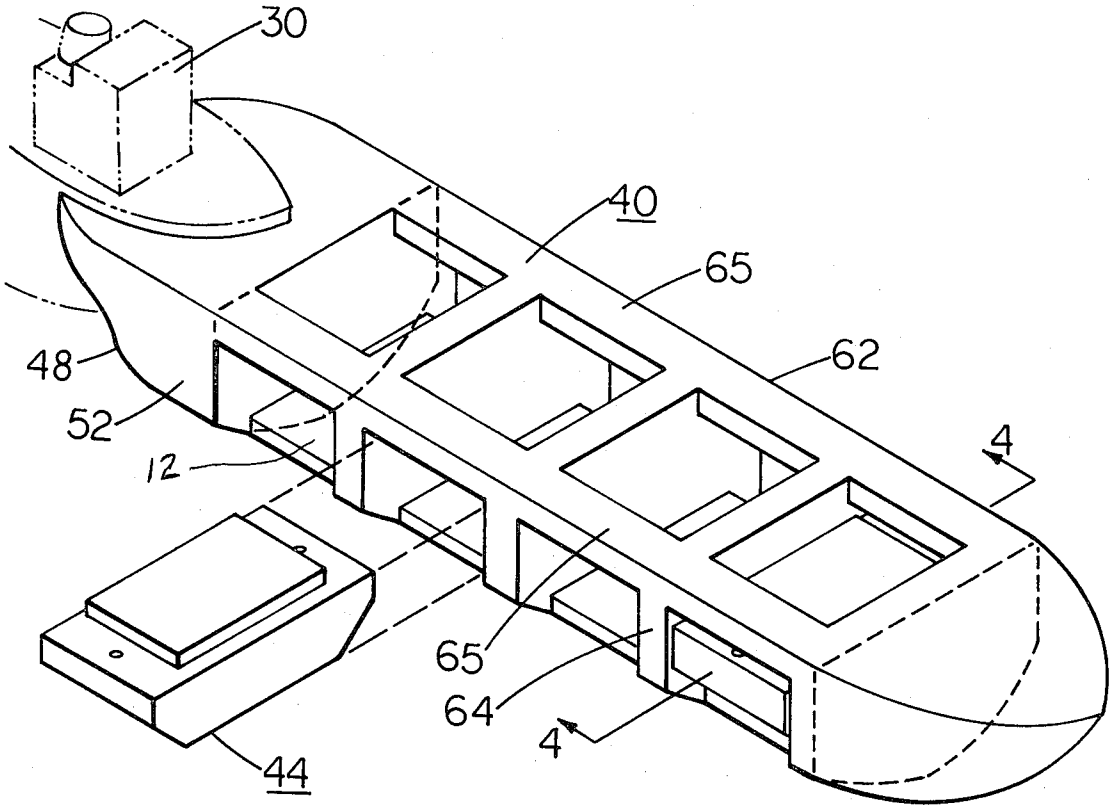


FIG. 3

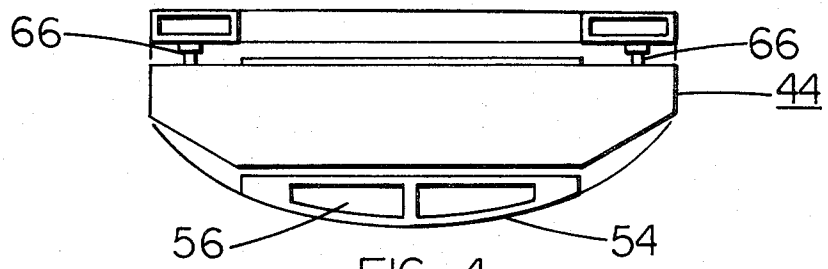


FIG. 4

APPARATUS FOR AND METHOD OF CARRYING MARINE CARGO

The invention relates generally to cargo carrying marine vessels, and more particularly to an apparatus for and a method of shipping marine cargo.

It is old in the art to use cargo storage lighters to carry cargo out to a ship and then to hoist lighter and cargo aboard for storage through deck hatches in the ship's holds.

It is an object of the invention to provide a ship's structure in which cargo modules can be floated and propelled aboard and secured therein as detachable holds and as fairing members of the ship's structure.

Another object of the invention is to provide a method of loading, carrying and unloading cargo with the least expenditure of time, energy and cost.

Other objects and a more complete understanding of the invention may be had by referring to the following description, claims and drawings, in which:

FIG. 1 is a three-dimensional view of a first specie of the invention,

FIG. 2 is a cross-sectional view of the invention taken along section lines 2—2 of FIG. 1,

FIG. 3 is a three-dimensional view of a second specie of the invention, and

FIG. 4 is a cross-sectional view of the invention similar to FIG. 2 taken along section lines 4—4 of FIG. 3.

Referring to FIGS. 1–4 the invention comprises in combination a marine vessel **10** or **40** having side opening cargo spaces **12** extending partially below a trimable waterline, and cargo modules **14** or **44** adapted to float out to and into said cargo spaces, the modules functioning as lighters between shore and vessel and as detachable cargo holds in an amidship crate structure of said vessel.

Referring to FIG. **1**, a first specie of the invention comprises bow and stern portions **16** and **18** respectively, which define flotation spaces **20** and **22.** A bottom portion **24**, defining flotation space **26** connects said bow and stern portions. The bottom and bow portions, **24** and **16** respectively are conventional in shape and watertight structure. The stern portion is designed to house propulsion apparatus for the vessel as a fixed installation **28.** The amidship portion **32** of the vessel **10** situated between said bow, stern and bottom portions comprises a crate structure **34** that outlines the shape of a similar portion of a conventional marine vessel and provides strength enough to hold the vessel and cargo together in a seaway. Side opening cargo spaces **12** are defined by equi-dimensional interstices in the crate structure **34** and between said structure and that of the connected bow, stern and bottom portions **16, 18,** and **24.** A deck **35** as substantial as bottom portion **24** (see FIGS. 2 and 4), closes the tops of cargo spaces **12.**

Referring to FIGS. 1 and **2,** a first specie of cargo module **14** is provided in at least the same plurality as cargo spaces, or in multiples of said plurality (not shown), shaped to fit singly or in combination in respective cargo spaces **12.** The cargo modules are watertight and used as lighters to carry cargo between ship and shore. The modules are adapted to be floated into the cargo spaces aided by winches **36** mounted on the crate structure, with tugs, or with small propulsion units (not shown). The vessel **10** is trimmed by partially flooding the floatation spaces to a depth to receive the modules or to discharge them by floating them in and out of said cargo spaces. After receiving modules the flotation spaces are evacuated for the vessel to make contact with the modules on the bottom portion **24.** The modules practically fill the cargo spaces and their ends fair the sides of the vessel **10** above and below its shallowest waterline.

Referring to FIGS. **3** and **4,** a second species of the invention leaves the cargo spaces **12** open at the top, and curves the bottom **54** of the crate structure **64** to present finer hull lines. The top of the crate structure is strengthened by gunwhales **65.** This second specie is illustrated having detachable propulsion apparatus that fits into an indented stern **48.** Fixed and detachable propulsion apparatus can be utilized in either of the species of the invention adapted therefor. Second specie modules **44** have bottoms beveled upwardly and outwardly at the ends that conform to the finer lines of a curved bottom **54** and thus contribute to the speed of the vessel **40.** At the same time the bevels make the modules easier to propel between ship and shore and in and out of structure **64.**

The modules of both species are held in place by jacks **66** that depend in the first specie from deck **35** and in the second from gunwhales **65** to engage the tops of the modules **14** and **44** respectively for pressing the modules against the bottom portion and locking them in place.

What is claimed is:

1. In combination, a marine vessel having an amidship of open crate structure comprising upper and lower longitudinal and upper transverse members rigidly defining one level of open-ended transverse compartments that extend transversely throughout said vessel for use as open sided cargo spaces that extend above and below the vessel's waterline, and floatable watertight cargo modules adapted to fill said cargo spaces and close said compartments to thereby load the vessel, and means for raising and lowering the vessel to ground said cargo modules in said cargo spaces, and jacks depending from said upper transverse members for engaging said cargo modules in compression in said cargo spaces to lock and release said cargo modules between said jacks and said lower longitudinal member in said cargo spaces.

2. In combination as described in claim **1** wherein outboard members of said cargo modules fair the bottom and outboard sides, above and below said vessel's waterline, of the amidship crate structure of the marine vessel.

* * * * *