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(54) **A convertible cargo vessel.**

(57) A cargo vessel comprises two or more narrow boats or barges (2,4) suitable for use individually on inland waterways, which, when close-coupled together along a longitudinal line (6), are suitable for use as a sea-going vessel.

The arrangement reduces the cost of inter-continental carriage of cargo by eliminating the need for trans-shipment of goods from barge to sea-going vessel and back again to barge whilst encouraging the use of inland waterways.

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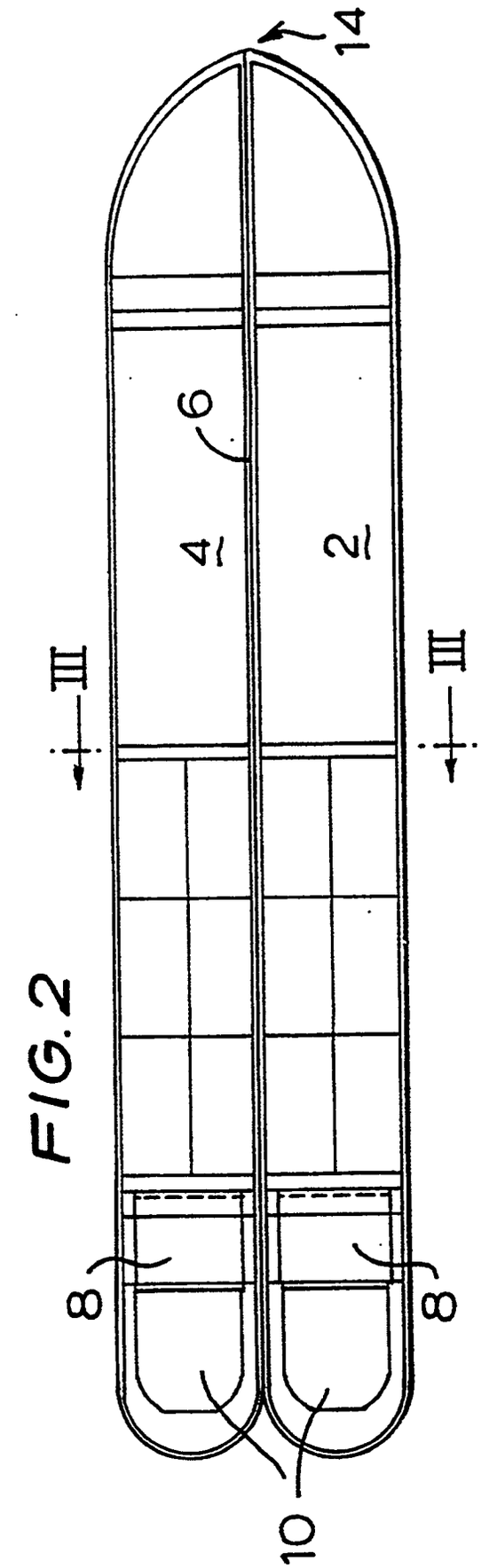

FIG. 2

This invention relates to cargo vessels.

It is particularly concerned with a type of vessel which is suitable for use as a sea-going cargo vessel and also for use on inland waterways.

It is usual when transporting goods from an inland location in one country to a similar inland location in another country to transport the goods by road or rail to a dock or wharf from where it is trans-shipped onto a sea-going cargo vessel. It is then transported across the sea to a port of the receiving country, from where it may again be trans-shipped onto another vehicle for transport to the receiver.

It has been the practice in recent years to utilize inland waterways, e.g. canals, to transport goods from the sea port to a wharf on the canal or other waterway convenient to the eventual receiving point.

The practice has then been to load the goods at their source of supply onto a road or rail vehicle and transport it to a wharf alongside a convenient waterway or canal where the goods are trans-shipped on to a barge. If the source of supply, e.g. a factory or warehouse is situated adjacent an inland waterway wharf then the goods are loaded directly on board the barge.The barge must necessarily be of a widthwise dimension to facilitate its passage through any lock systems in the canals.

The barge then proceeds along the waterway to the nearest commercial seaport where the goods are trans-shipped from the barge to a sea-going cargo vessel. That vessel then crosses the seas to the nearest seaport in the receiving country and the goods are trans-shipped on to an inland waterway barge to be transported by that barge to the nearest convenient inland wharf. The goods are again trans-shipped from the barge to a road or rail vehicle for transport to the intended receiver, unless of course, the receiver is located adjacent the wharf.

The time delay and consequent cost caused by the repeated trans-shipment of goods from a first barge to the seagoing vessel and then from that same vessel to a second barge has seriously discouraged the use of inland waterways where eventual delivery overseas is concerned, despite the fact that inland waterways are readily available and convenient in for example European countries.

It is an object of this invention to provide a cargo carrying vessel which is capable of providing seagoing transport in one form and converting into a canal ship configuration in another form.

British Patent specification 2173744A discloses an arrangement of floating vessels coupled in line astern and which may be pushed or towed in line, but there is no facility for converting these vessels for use as an ocean-going ship.

It is known to provide a catamaran type of vessel for use as a passenger or goods ferry, but such vessels are not readily convertible into two or more narrow boats.

According to the invention there is provided a floating vessel comprising at least two separate hulls capable of being detachably connected together to provide a unitary composite vessel, characterized in that the separate hulls are arranged to be connected one to another along at least one longitudinal line.

At least one of the hulls may be provided with a conventional thruster unit, which may be in the form of a rotary propeller.

At least one of the hulls may be provided with a bow thruster.

Each of the hulls may be so formed that when they are connected together the resultant composite vessel exhibits a conventional bow form in plan view.

Preferably the separate hulls are of a widthwise dimension appropriate for use in inland waterways, and when coupled together side by side form a single composite vessel appropriate for sea-going transportation.

The invention further comprises a method of conveying cargo which method comprises loading each of two or more separate hulls constituting a floating vessel, conveying the hulls substantially in line astern along an inland waterway system to an ocean-side quay, connecting the separate hulls side by side and thereafter conveying the loaded and connected hulls across a sea to a further ocean-side quay.

At the further ocean-side quay the connected hulls may be disconnected from each other and are thereafter conveyed substantially in line astern through a further inland waterway system to a required destination.

One embodiment of the invention will now be described by way of example only, with reference to the accompanying drawings in which:-

Figure 1 is a side elevation of a composite vessel according to the invention,

Figure 2 is a plan view,

Figure 3 is a section view on the line III - III of Figure 2.

In the example seen in the drawings the composite vessel according to the invention comprises two hull members 2, 4 closely coupled and firmly secured together along a longitudinal median line at 6.

Each hull is provided with a wheel house 8 and an engine room 10 together with a thruster unit in the form of a conventional propeller drive 12. A bow thruster [not shown] is provided to improve the manoeuvrability of the vessels.

The bow of each hull member is so shaped that the assembly of hulls in its close coupled condition provides a somewhat conventional bow shape as seen at 14 in Figure 2.

The hulls of the composite vessel are of conventional flat bottomed structure as clearly seen in Figure 3 and are preferably formed to accomodate either bulk cargo, liquids or container cargo as desired.

The construction of each hull is in the form of a

framed welded steel structure and is relatively inexpensive.

Ballast tanks [not shown] are provided within the hull in the usual way.

In use on inland waterways, each vessel is individually loaded at a convenient wharf and proceeds under its own power to an appropriate seaport or harbour. There the separate vessels are approximately aligned transversly by means of suitable locating devices [not shown]. If the vessels have not been loaded to the same extent, vertical adjustment is made by loading or unloading the ballast tanks to ensure substantially identical heightwise location of one vessel to the other. The vessels are then firmly secured to each other and henceforth are treated in most respects as a single conventional cargo vessel which is capable of providing normal sea-going transportation.

When the composite vessel has completed the sea-going part of its journey and reaches a port or harbour of the receiver country its two hulls are then uncoupled and proceed under their individual power via inland waterways to a chosen wharf or dock for unloading.If desired the power unit of only one vessel may be utilized to tow or push the second vessel in line astern.

Due to the configuration of the bows of the hulls 2 and 4 necessary to present a conventional bow form [in plan] when assembled, the vessels when operating separately would tend to divert from a straight longitudinal path under a normal straight thrust drive. In order to combat that tendancy the keel of each hull may be trimmed as necessary. Alternatively the bow thruster may be used to effect corrective steering, or a conventional rudder may be similarly utilised, or the vessels may proceed in reverse. As seen in Figure 2 the stern of each hull may be appropriately shaped to facilitate such reverse procedure.

An appropriately designed arrangement for transporting bulk cargo according to the invention has a length of 60 metres, a beam dimension of 6 metres and a depth of 3.4 metres. With a maximum draft of 2.45 metres each separate hull is capable of carrying up to 650 tonnes of cargo.

Propulsion was by means of a single diesel engine in each hull 2 and 4 driving a propeller, and a bow thruster was also fitted to improve the vessel's manoeuvrability.

A designed arrangement for a container vessel had similar dimensions as the bulk cargo vessel except that its depth was increased to 5.8 metres. Such a vessel was capable of transporting a load of more than 500 tonnes in the form of 24 I.S.O. containers each 6 metres long, 2.4 metres wide and 2.6 metres high and each weighing up to 26 tonnes, that load being transported in each separate hull.

Thus it will be understood that such an arrangement is effective in reducing the total cost of transportation of the goods by eliminating the need for transshipment of the goods from barge transport to sea-going vessel and possibly back again to barge transport. This is seen to encourage the use of inland waterways with resultant monetary and environmental advantages.

For example, it is estimated that a single inland waterways lock system is capable of carrying 11,900 tonnes of cargo in a 10 hour day using 20 vessels. The same cargo would be carried by 495 road transport vehicles each having a 24 tonnes capacity.

As a further statistical representation of the advantages of the system, the physical length of the total load using this type of canal ship would be about 1,200 metres, whilst the nose-to-tail length of the equivalent road transport vehicle load would be about 7,400 metres, or 4.6 miles of motor way!

Although the above description is of an illustrative embodiment having two hulls, it is to be understood that a vessel utilizing more than two hulls capable of being conjoined along longitudinal lines may be provided within the scope of the invention.

Claims

1. A floating vessel comprising at least two separate hulls capable of being detachably connected together to provide a unitary composite vessel, characterized in that the separate hulls (2, 4) are arranged to be connected one to another along at least one longitudinal line (6).

2. A floating vessel according to Claim 1 wherein at least one of the hulls (2 or 4) is provided with a conventional thruster unit (12).

3. A floating vessel according to claim 2 wherein the thruster unit is in the form of a rotary propeller.

4. A floating vessel according to claims 1, 2 or 3 wherein at least one of the hulls is provided with a bow thruster.

5. A floating vessel according to claim 1 wherein each of the hulls is so formed that when the hulls are connected together the resultant composite vessel exhibits a conventional bow form in plan view.

6. A floating vessel according to any of claims 1 to 5 wherein the separate hulls are of a widthwise dimension appropriate for use in inland waterways, and when coupled together side by side form a single composite vessel appropriate for sea-going transportation.

7. A method of conveying cargo which method com-

prises loading each of two or more separate hulls constituting a floating vessel, conveying the hulls substantially in line astern along an inland waterway system to an ocean-side quay, connecting the separate hulls side by side and thereafter conveying the loaded and connected hulls across a sea to a further ocean-side quay.

8. A method of conveying cargo according to claim 7 wherein at the further ocean-side quay the connected hulls are disconnected from each other and are thereafter conveyed substantially in line astern through a further inland waterway system to a required destination.

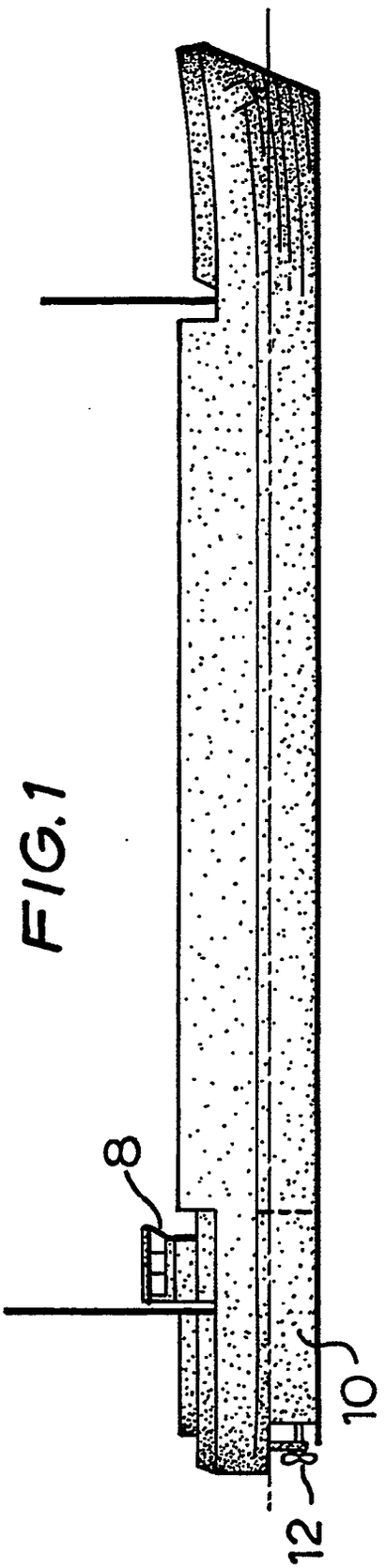

FIG.1

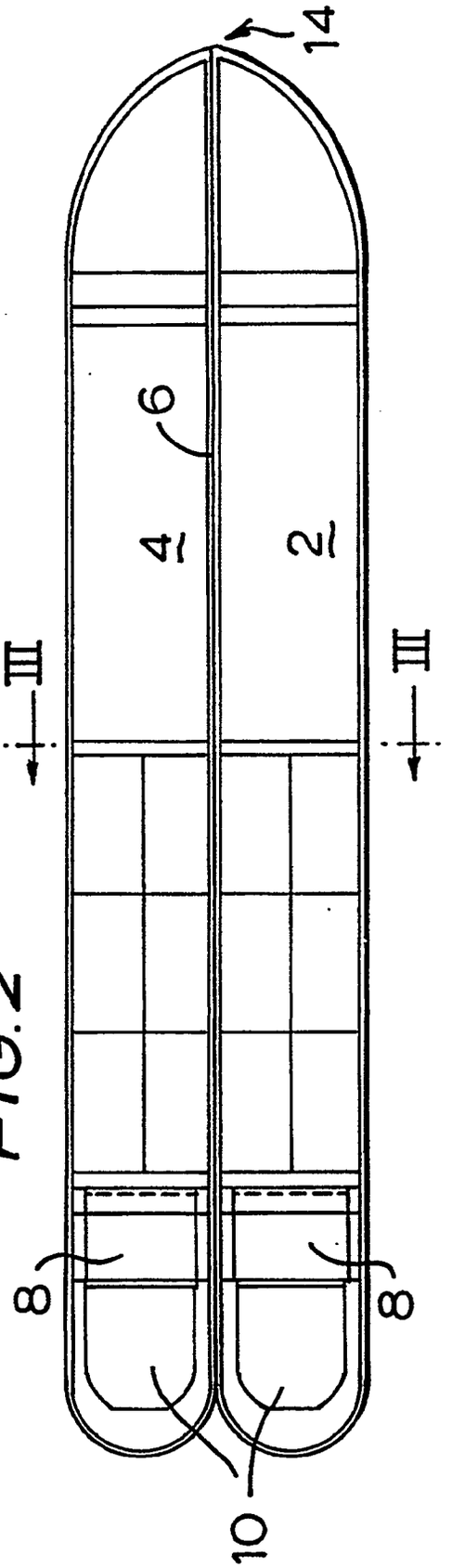

FIG.2

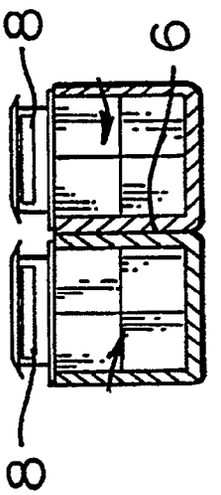

FIG.3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 30 3043

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	FR-A-2 046 001 (CHANTIERS DE L'ATLANTIQUE) * Claims 1-14 *	1-3,5,6-8	B 63 B 3/08 B 63 B 21/62
X	DE-A-3 119 765 (DEGGENDORFER) * Page 5, line 17 - page 6, line 7; figures 1-8 *	1-3,6-8	
A	FR-A-2 036 514 (CHANTIERS DE L'ATLANTIQUE)		
A	DE-A-1 506 718 (BODAN)		
A	GB-A- 625 (CHURCHILL)(A.D. 1913)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 63 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	01-07-1991	DE SCHEPPER H.P.H.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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