

PATENT SPECIFICATION

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(54) FLOATABLE RAMP

(71) We, MACGREGOR & COMPANY (NAVAL ARCHITECTS) LIMITED, a British Company, of MacGregor House, 86/90 Front Street Monkseaton, Whitley Bay, Tyne & Wear NE25 8DN, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a floatable ramp for use between a ship and the shore, particularly for roll-on/roll-off ships.

It is conventional to provide a ramp either on the ship or on shore with which to provide a bridge allowing motorised traffic to drive onto and off the ship. The present invention provides a bridge which is independent of both ship and shore, and which can be used at a number of different berths within a port or harbour, or at another port.

According to the invention there is provided a floatable ramp comprising a barge or pontoon carrying a bridge, and support means for supporting the bridge on the barge or pontoon and for enabling raising or lowering of the bridge, wherein the bridge comprises a rigid span and the support means is coupled with the span inwardly of its ends with the ends of the span projecting or projectable on opposite sides or ends of the barge or pontoon.

In order that the invention and its various other features may be understood more easily, an embodiment thereof will now be described by way of example only, with reference to the drawings, in which:—

Figure 1 shows a side view of a barge or pontoon in position between a ship and the shore; and

Figure 2 shows a plan view of the same barge or pontoon.

A ship 10 is moored adjacent a quay 11, a rectangular barge 12 being trapped between the two, with the interposition of fenders 13, 14 on the barge. The fenders 14 are mounted on fender brackets 15 upstanding from the deck of the barge 12. Linking the ship and the shore is a bridge 16 comprising a single rigid span which has end pieces 17 pivotted on transverse axes at each end, and low side walls 18.

The bridge 16 is restrained fore-and-aft, and transversely, by four vertical guide columns 20. It is supported above the barge by hydraulic rams 21, 22, which comprise piston and cylinder assemblies, which rams are independently adjustable in their extension. The rams 22 may lie within the guide columns 20. The rams 21, 22 are pivotted on both the barge and the bridge. This allows for tilting of the bridge.

A console 23 contains the operating controls for the hydraulic rams, and also for a small propulsion unit for the barge, if required.

In use, the barge is towed, or drives itself, to the required berthing position, and is moored to the quay 11 against the fender 13 after the bridge 16 has been raised to its highest position by means of the hydraulic rams 21, 22. This position is shown in chain-dotted lines in Figure 1. The ship 10 is then brought up to the barge 12 and moored to the quay 11 so that the barge is trapped between the ship and the shore. The barge moorings are then slackened off, so that the pontoon will rise and fall with tidal variations, and so that changes in the draught of the ship will have no effect. Thereafter, the bridge 16 is lowered until the end pieces 17, which are pivotably coupled with the bridge 16, land on the quay 11 and the ship 10. The hydraulic circuits to the rams 21, 22 can then be opened so that the bridge is no longer directly supported by the barge. The loads on the bridge are taken on the ship and the shore and the barge merely acts as a floating fender. The end pieces 17 serve to locate on the ship or shore and effectively distribute the weight of the bridge over an increased area.

Various modifications of this embodiment are possible. The bridge can be suspended on cables or chains coupled with the rams. Alternatively, the bridge can be suspended on cables or chains and, instead of being supported by hydraulic rams, the cables or

chains may be wound onto take up drums. The take up drums may be operated by mechanical, electrical or hydraulic means and may be actuable manually by for example winches or hydraulic pumps. The bridge need not have parallel sides, or indeed even be straight.

It will be clear that a barge/bridge according to the invention can obviate the need for providing a separate fixed bridge at every quay, and the need for providing a fixed ramp on a roll-on/roll-off ship.

The span of the bridge may be provided with end pieces which are extensible to extend the effective length of the span for example runners could be provided which can slide out from the ends or which can pivot out from the ends with such an arrangement it is not essential for the span to project on opposite sides or ends of the barge or pontoon when the end pieces are withdrawn.

It is to be understood that the barge carrying the bridge may be a cantamaran or may be of other multi-hull construction.

WHAT WE CLAIM IS:—

1. A floatable ramp comprising a barge or pontoon carrying a bridge, and support means for supporting the bridge on the barge or pontoon and for enabling raising or lowering of the bridge, wherein the bridge comprises a rigid span and the support means is coupled with the span inwardly of its ends with the ends of the span projecting or projectable on opposite sides or ends of the barge or pontoon.

2. A floatable ramp as claimed in Claim 1 wherein the support means comprises lifting devices coupled with the bridge towards opposite ends of the span.

3. A floatable ramp as claimed in Claim 2, wherein the support means comprises four lifting devices provided two towards each end of the span, which lifting devices

are coupled with the bridge at or towards opposite sides or ends of the span.

4. A floatable ramp as claimed in Claim 2 or 3, wherein the lifting devices comprises hydraulic rams.

5. A barge or pontoon as claimed in Claim 4, wherein the rams are pivotally mounted on the span and on the barge or pontoon.

6. A floatable ramp as claimed in Claims 2 or 3, wherein the lifting devices comprise cables or chains.

7. A floatable ramp as claimed in Claim 6 wherein the cables or chains are windable onto take up drums to raise the bridge.

8. A floatable ramp as claimed in any one of Claims 2 to 7 wherein the lifting devices are independently controllable.

9. A floatable ramp as claimed in any preceding Claim provided with guide means effective to restrict transverse movement of the bridge on the barge or pontoon.

10. A floatable ramp as claimed in any preceding Claim wherein the support means is settable into a non bridge supporting condition to enable the bridge to be supported by resting on spaced apart surface.

11. A floatable ramp as claimed in any preceding Claim wherein each end of the span is provided with a respective extension piece hingedly coupled therewith about an axis extending transversely of the span.

12. A floatable ramp as claimed in Claim 11, wherein each of the extension pieces is adapted to support the span on a surface and to distribute the weight of the bridge over an increased area.

13. A floatable ramp substantially as described herein with reference to, or as illustrated in the drawings.

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It will be clear that a barge/bridge according to the invention can obviate the need for providing a separate fixed bridge at every quay, and the need for providing a fixed ramp on a roll-on/roll-off ship.

The span of the bridge may be provided with end pieces which are extensible to extend the effective length of the span for example runners could be provided which can slide out from the ends or which can pivot out from the ends with such an arrangement it is not essential for the span to project on opposite sides or ends of the barge or pontoon when the end pieces are withdrawn.

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2. A floatable ramp as claimed in Claim 1 wherein the support means comprises lifting devices coupled with the bridge towards opposite ends of the span.

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are coupled with the bridge at or towards opposite sides or ends of the span.

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8. A floatable ramp as claimed in any one of Claims 2 to 7 wherein the lifting devices are independently controllable.

9. A floatable ramp as claimed in any preceding Claim provided with guide means effective to restrict transverse movement of the bridge on the barge or pontoon.

10. A floatable ramp as claimed in any preceding Claim wherein the support means is settable into a non bridge supporting condition to enable the bridge to be supported by resting on spaced apart surface.

11. A floatable ramp as claimed in any preceding Claim wherein each end of the span is provided with a respective extension piece hingedly coupled therewith about an axis extending transversely of the span.

12. A floatable ramp as claimed in Claim 11, wherein each of the extension pieces is adapted to support the span on a surface and to distribute the weight of the bridge over an increased area.

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