March 4, 1969 T. F. THOMPSON 3,430,601

BARGE COUPLING ASSEMBLY

Filed Jan. 24, 1967 Sheet 1 of 2

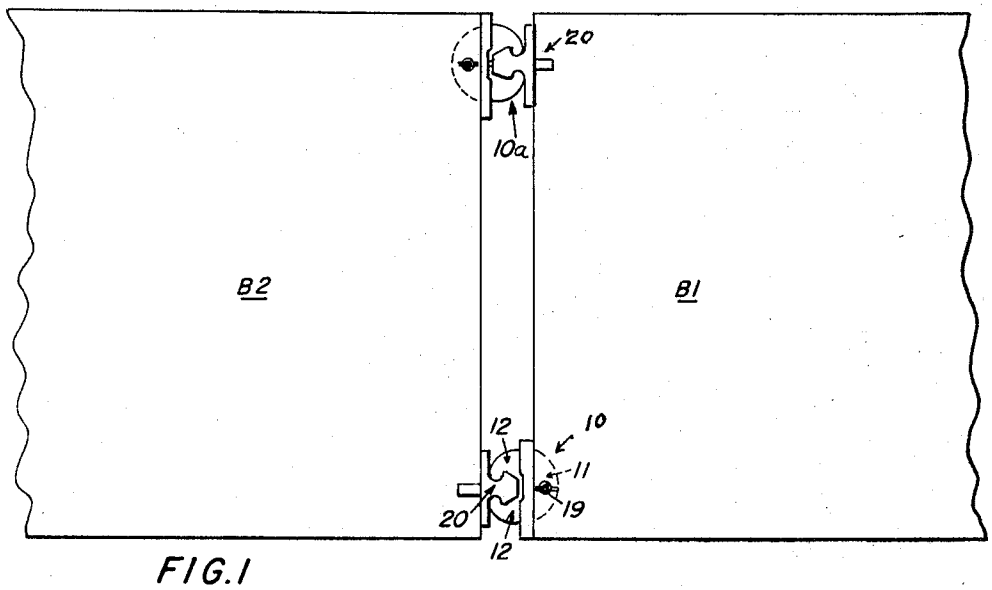


FIG. 1

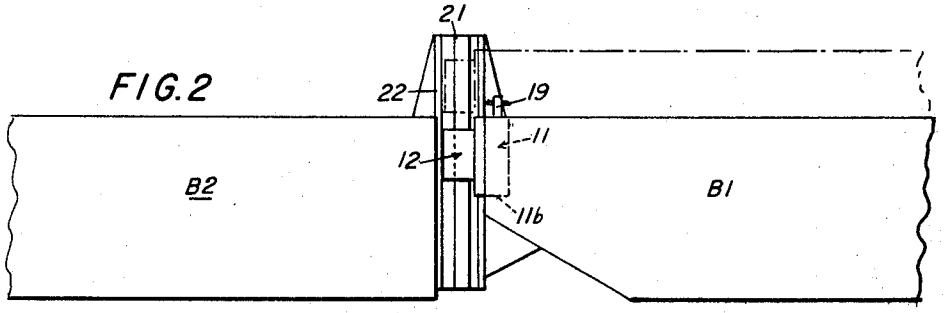


FIG. 2

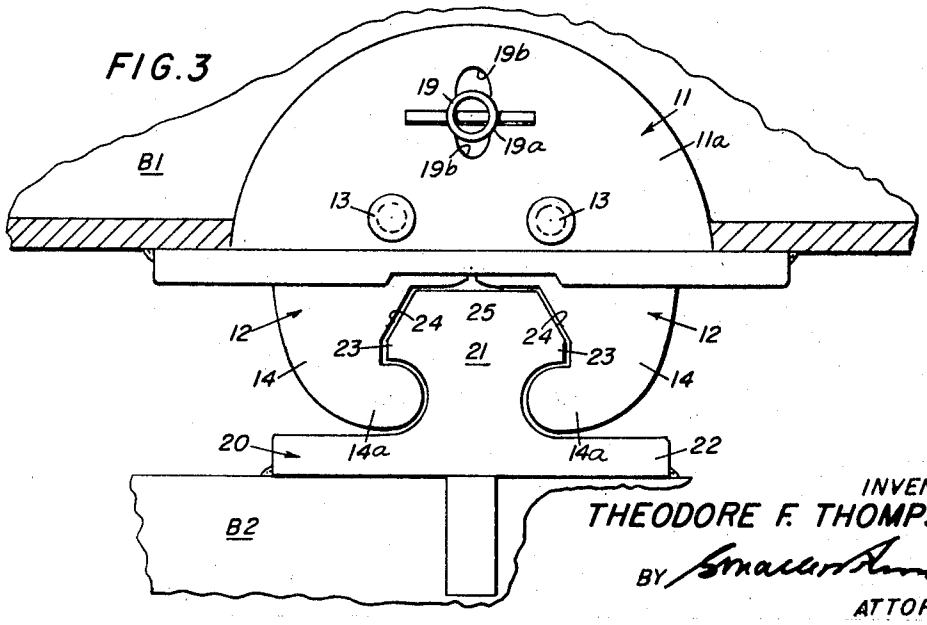


FIG. 3

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FIG. 4

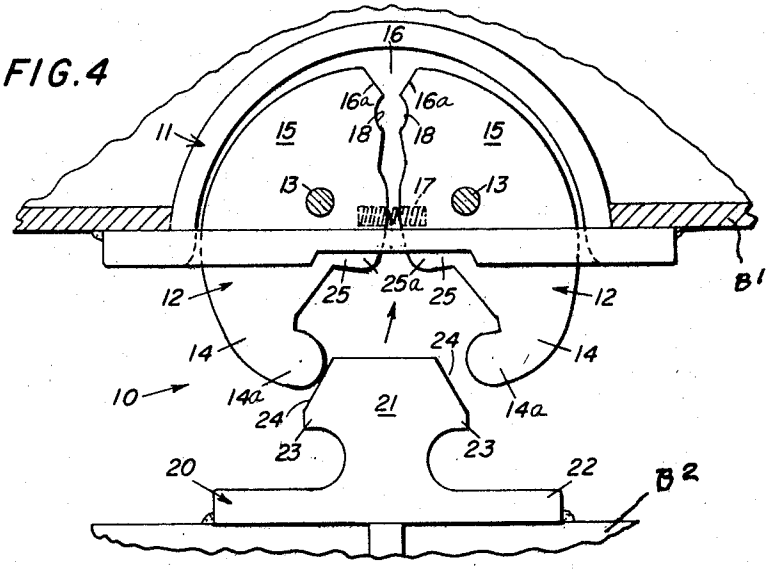


FIG. 5

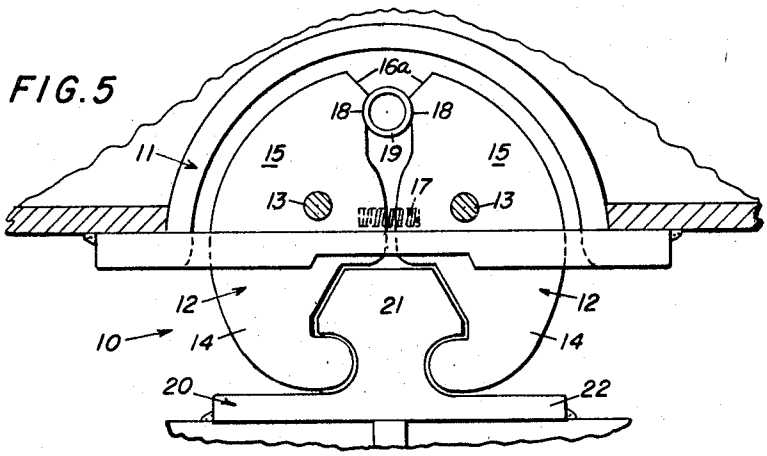
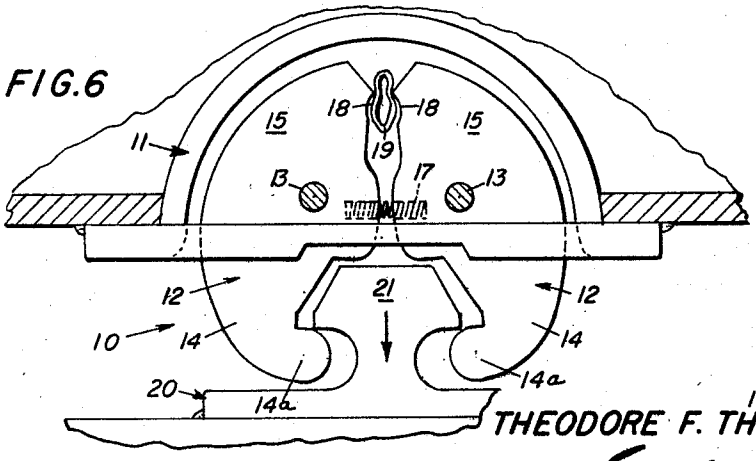


FIG. 6



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BARGE COUPLING ASSEMBLY

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Int. Cl. B63b 21/58

ABSTRACT OF THE DISCLOSURE

A coupling assembly for barges comprising a vertical anchoring bar fixed to one barge and a coupling unit mounted on the adjacent end of another barge. The coupling unit has a pair of pivoted levers respectively terminating at one end in coacting jaws between which the anchoring bar is receivable, and the opposed edges of their opposite ends have sufficient lateral clearance therebetween to accommodate pivotal opening and closing of the jaws. The levers are normally spring-biased to open the jaws, and the jaws are locked in closed position by a metal tube which is insertable between the spaced lever ends. The tube is laterally deformable in response to a predetermined, mechanical, outward pressure exerted on the jaws to thereby release them from locked position.

Background of invention

Heretofore, it has been the usual procedure in coupling barges to first align adjacent barges in end-to-end relation, and, thereafter, to attach cables to the timberheads at the ends of the barges and tighten the cables by ratchets or other means to pull the barges together. This process is not only time consuming, but is dangerous to the barge hands. Furthermore, it is periodically necessary to take up slack in the cables, which further adds to the manual labor and danger.

Summary of invention

The present invention eliminates the dangers and time-consuming efforts in coupling barges by providing a simple, semi-automatic coupling assembly, including a vertically elongated anchoring bar fixed to one barge and a coupling unit mounted on the adjacent end of another barge. The coupling unit comprises a pair of pivotally mounted jaws between which the anchoring bar of another barge is reecivable. The jaws are normally biased to open position by suitable spring means, and the open jaws are designed to present camming shoulders which, upon impact by the inserted anchoring bar, automatically cause the jaws to close in gripping engagement with the bar. A pin which is insertable between the spaced opposite ends of respective jaws automatically drops into place to retain the jaws in locked position.

The locking pin is preferably in the form of a tube of aluminum or other metal which is laterally deformable under a predetermined outward pressure applied to the jaws. Thus, under this predetermined pressure, the tube is crushed to permit the jaws to open and release the coupling.

By the use of this semi-automatic coupling, time, effort and accidents are reduced to a minimum, and it is unnecessary to employ specially trained hands to effect the coupling operation. Furthermore, in the event of an accident, such as grounding, hitting a bridge or other obstacle, the coupling will automatically be released with no flying parts or loose broken wires, and with little effort the barges can thereafter be recoupled by simply inserting a new locking pin. It is estimated that all rigging costs will be cut 75–80%.

The drawings

Referring to the drawings in which numerals of like character designate similar parts throughout the several views:

FIG. 1 is a fragmentary top plan view of two adjacent barges in coupled relation, employing the coupling assemblies of the present invention;

FIG. 2 is a fragmentary view in side elevation;

FIG. 3 is a top plan view of one of the coupling assemblies in locked position;

FIG. 4 is a similar view with the top closure plate of the coupling unit removed and with the jaws in open position;

FIG. 5 shows the coupling jaws in locked position, the top closure plate being removed for clarity; and

FIG. 6 is a similar view illustrating the deformation of the locking pin when a predetermined outward pressure is exerted on the jaw members.

Description of preferred embodiment

As best seen in FIGS. 4–6, the coupling assembly of the present invention comprises a coupling unit generally indicated at **10** which consists of a housing **11** secured by any suitable means to an end of one barge B1, said housing having top and bottom closure plates **11***a* and **11***b* respectively. A pair of levers **12** are pivotally mounted intermediate their ends on vertical pins **13**, supported in the top and bottom closures of the housing, and the respective levers terminate at their outer ends in opposed, inwardly directed coupling jaws **14** which are preferably rounded as at **14***a* for the purpose hereinafter described. The jaws **14** project horizontally through the outer open end of the housing **11**, as seen from the drawings, and are thus presented for the reception of an anchoring bar fixed to another barge, as will later appear.

The opposite ends **15** of the respective levers **12** are arranged with their opposed edges in spaced relation as at **16** to provide a clearance space for accommodating the pivotal movement of the levers in opening and closing the jaws **14**. A coil spring **17** is interposed between the levers **12** in off-center relation with respect to the pivot pins **13**, in the direction of the jaws **14** so as to normally bias the levers to jaw-opening position, as seen in FIG. 4.

Adjacent the outer extremities of the lever ends **15**, the opposed edges diverge as at **16***a* and at the inner extremities of these divergent edges, recesses or notches **18** are provided for receiving a vertically insertable lock member **19** (FIG. 5) which, when the jaws **14** are in closed position, serves as an abutment to prevent the pivotal opening movement of the levers **12**.

On the adjacent end of a second barge B2, an anchoring unit **20** is mounted for engagement by the jaws **14**. This anchoring unit comprises an elongated, vertically disposed anchoring bar or rail **21** which is secured to the barge B2 by a mounting plate **22** fastened to the end of the barge. As will be seen from the drawings, the anchoring bar **21** is outwardly offset from the plate **22** and is receivable between the jaws **14** of the coupling unit **10**, and its longitudinal edges **23** are laterally flared for gripping engagement by the inwardly directed jaws **14**.

Preferably, to facilitate the automatic coupling operation and engagement with the jaws **14**, the flaring edges of the bar **21** terminate in converging planes as at **24**. The outer longitudinal face of the bar and these converging edges are designed for camming action with oppositely, inwardly directed shoulders **25** on the levers **12** within the jaw opening. Preferably, the adjacent extremities of shoulders **25** are rounded as at **25***a* to further aid in this camming action. Thus, with the jaws **14** on the coupling unit of barge B1 normally biased to open position by spring **17** barge B2 may be maneuvered to

direct its anchoring bar **21** between the open jaws **14**. With the continued inward movement of the bar **21**, the latter abuts the shoulders **25** and the impact thereof causes a camming action which overcomes the pressure of spring **17** and pivots the levers **12** to close the jaws **14** as in FIG. 5. Then the insertion of the lock pin **19** in the notches **18** prevents the reverse pivotal movement of the levers and the jaws are locked in closed position.

While the pin **19** may be manually inserted in the notches through an opening **19***a* in the top closure plate **11***a*, FIG. 3, the assembly is preferably designed so that the pin **19**, when the jaws are open, simply rests in outwardly displaced position in the opening, with its bottom extremity supported on the upper surfaces of the inwardly urged ends **15** of the levers. Then, upon the outward pivotal movement of the ends **15** of levers **12** to close the jaws, the ends **15** slide from beneath the pin **19** which automatically drops into the notched portions **18** of the levers to lock the jaws in closed position, as seen in FIG. 5.

In order to provide a safety feature for automatically releasing the coupling in the event a barge becomes grounded or encounters an obstruction, the locking pin **19** is preferably formed of an aluminum tube of a wall thickness or gauge which will automatically become crushed under a predetermined pressure applied to the jaws in locked position as in FIG. 6. It has been found that a pulling pressure on a barge in excess of 100 tons will cause considerable damage in the event of the grounding of the barge, and, therefore, the locking pin **19** is designed to remain intact at pressures under 100 tons, but to laterally crush under pressures in excess of this magnitude.

As seen in FIG. 3 in order to facilitate the removal of a crushed locking pin for the replacement of a new pin the top closure plate **11***a* is provided adjacent the pin opening **19***a*, with opposed cut-out portions **19***b*. These cut-out portions will give sufficient clearance to the deformed portion of the pin to effect its ready removal. As will be seen from FIG. 5, the periphery of the pin **19** is only partially embraced by the notched areas **18** of the levers **12**, and any crushing of the pin or tube, as in FIG. 6, causes the latter to expand into the space between the ends **15** of the levers.

As seen in FIG. 2, the locking bar is vertically elongated and extends both above and below the jaw members **14**. Thus, coupling may be effected between two barges on different vertical planes in order that loaded barges and empty barges may be readily coupled, as well as two loaded or two unloaded barges. This arrangement also facilitates the towing operation, as it compensates for any variations in the vertical planes of barges in the course of towing. It will be understood that the jaws **14** engage the bar **21** with sufficient clearance to allow for this compensating feature.

It is desirable in towing a fleet of barges that they be linked together to form a single, rigidly connected unit, and with the present invention, two laterally spaced coupling assemblies are provided between the ends of adjacent barges to prevent relative lateral or angular movement between the barges.

Also, in order to facilitate the universal adaptability of the invention, it is preferable to alternately reverse the positions of the two assemblies at each end of a given barge. Thus, as shown in FIG. 1, one coupling assembly is arranged with the coupling unit **10** attached to barge

B1, and its anchoring unit **20** is attached to barge B2, while the second coupling assembly is arranged with the coupling unit **10***a* attached to barge B2 and its anchoring unit **20** attached to barge B1. Thus, regardless of the positioning of the barges, the coupling units of the respective assemblies will always be in position to receive the anchoring units of an adjacent barge.

I claim:

1. A coupling assembly for connecting two portable bodies in end-to-end relation, comprising an anchoring unit fixed to one end of a first body, said anchoring unit having a vertically extending, laterally flaring anchoring bar, a coupling unit secured to the adjacent end of a second body and including a pair of levers pivotally mounted intermediate their ends on vertical axes for relative horizontal, swinging movement, corresponding ends of respective levers terminating in coacting, inwardly directed jaws between which the anchoring bar on said first body is loosely receivable, the adjacent opposite ends of respective levers, when said jaws are in locking engagement with said anchoring bar, being laterally spaced a distance to accommodate the opening movement of said jaws, and a locking element comprising a metal tube of a wall strength designed to collapse laterally under a predetermined lateral mechanical pressure, removably insertable between and engageable by the spaced ends of said levers to normally prevent said opening movement, but which, when collapsed by excessive force from said levers, automatically permits said jaws to open.

2. A coupling assembly as claimed in claim **1**, wherein said pivoted levers are mounted in a housing secured to the end of said second body, a top plate for said housing overlying the spaced ends of said levers and a vertical opening in said top plate for receiving said metal tube and aligned with the space between said jaw members.

3. A coupling assembly as claimed in claim **1**, including spring means normally biasing said levers and jaws to open position, a housing for said pivoted levers, a top plate for said housing, a vertical opening in said top plate aligned with the space between the underlying ends of said levers when the latter are rotated to close said jaw members, the top surfaces of said lever ends being adapted to at least partially underlie said opening when the jaw members are in open position, whereby, when said locking element is inserted in said opening, its lower extremity is supported on the top surfaces of the ends of said levers, and when said jaw members are closed, said locking element automatically drops into the space between said lever ends to prevent opening of said jaw members.

4. A coupling assembly as claimed in claim **3**, including coacting cam means on said levers and anchoring bar for automatically rotating said levers to close said jaws upon impact by said anchoring unit.

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U.S. Cl. X.R.

24—230; 280—451