Nov. 9, 1948. H. B. NELSON ET AL 2,453,155

FLOATING DOCK AND WHARF

Filed June 30, 1945 3 Sheets-Sheet 1

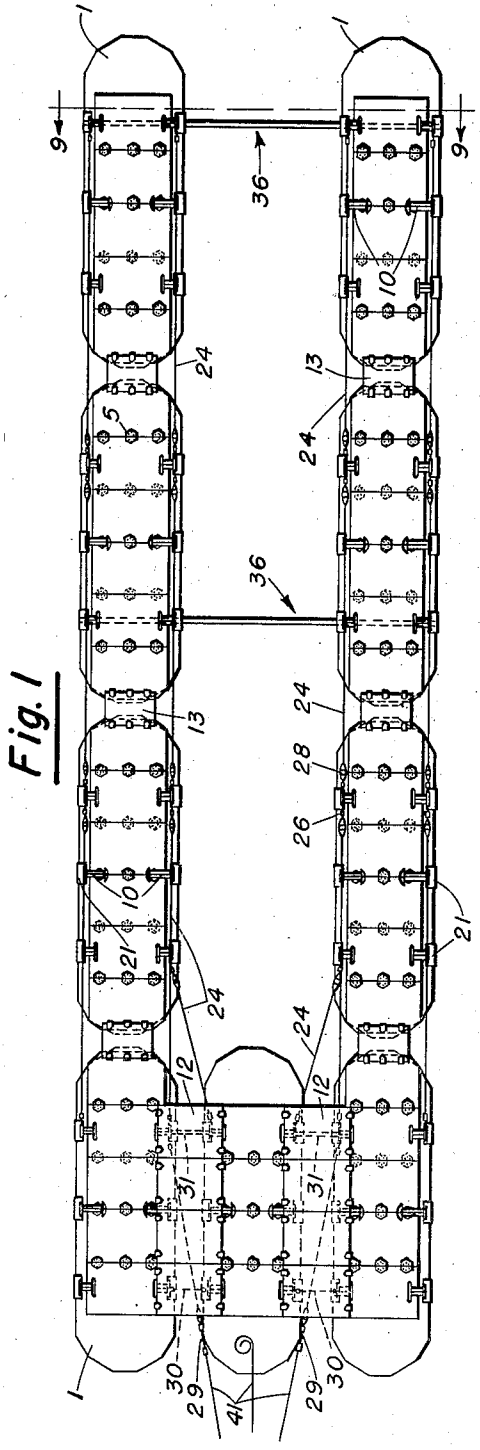


Fig. 1

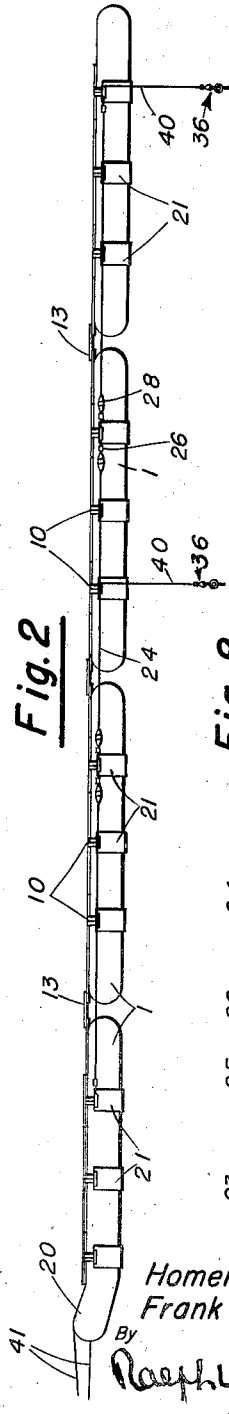


Fig. 2

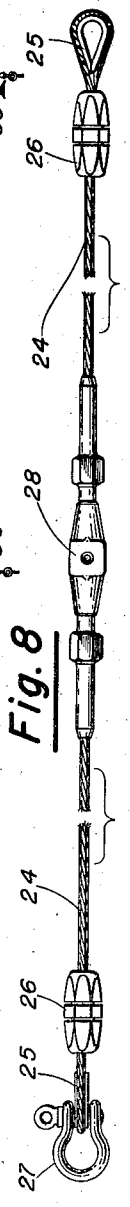


Fig. 8

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FLOATING DOCK AND WHARF

Filed June 30, 1945 3 Sheets-Sheet 2

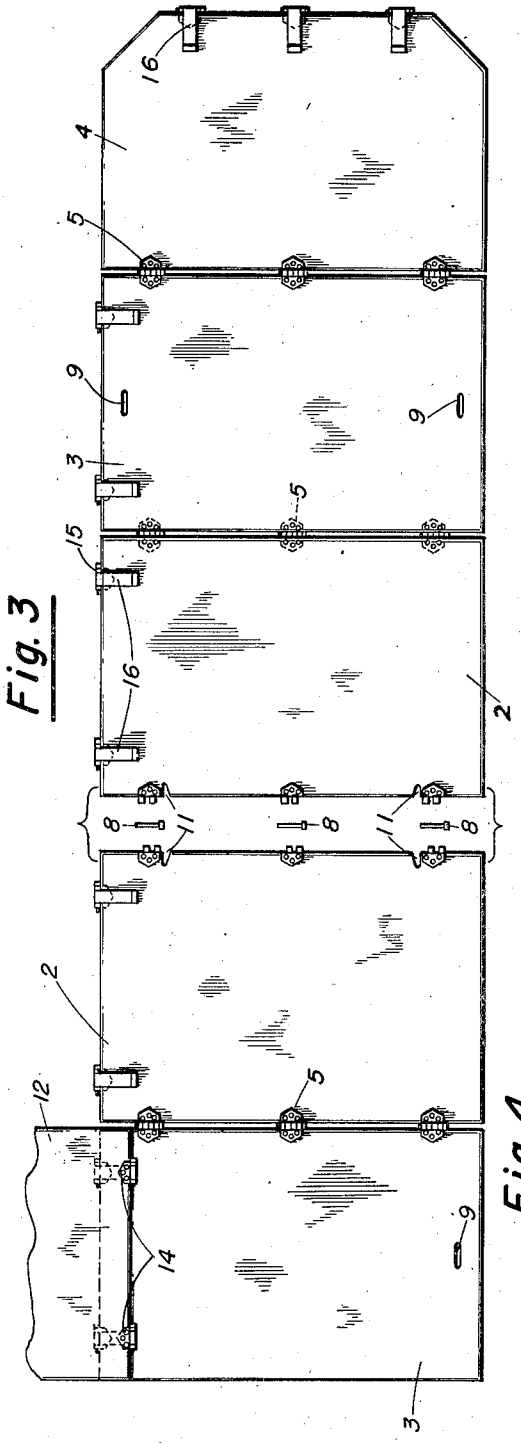


Fig. 3

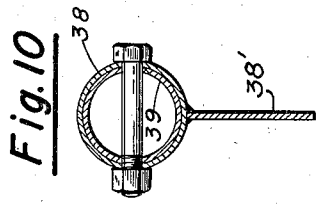


Fig. 10

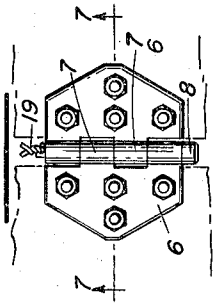


Fig. 6

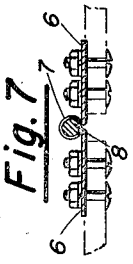


Fig. 7

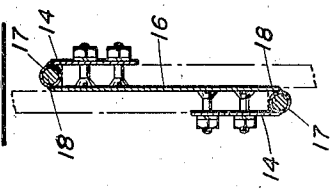


Fig. 5

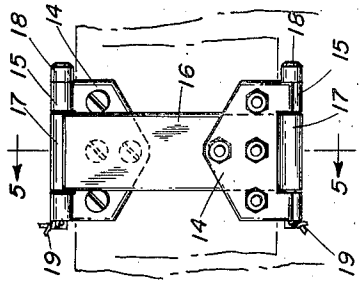


Fig. 4

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FLOATING DOCK AND WHARF

Filed June 30, 1945 3 Sheets-Sheet 3

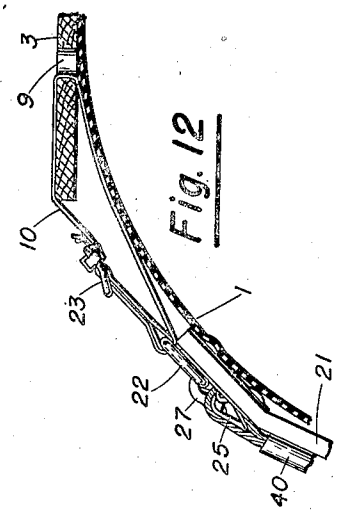
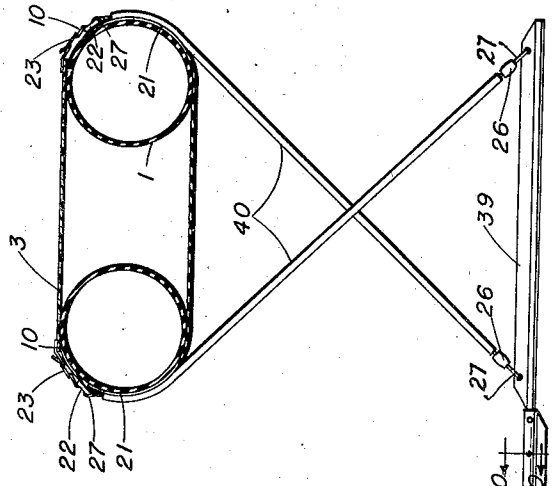


Fig. 12



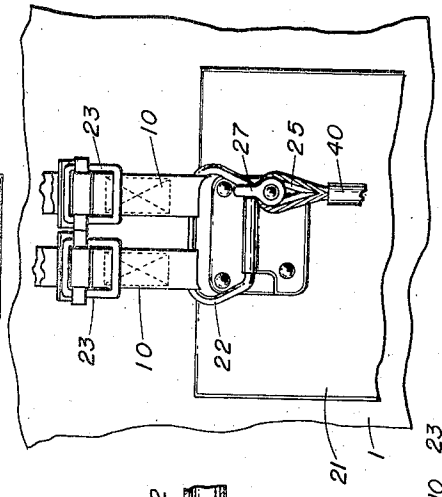
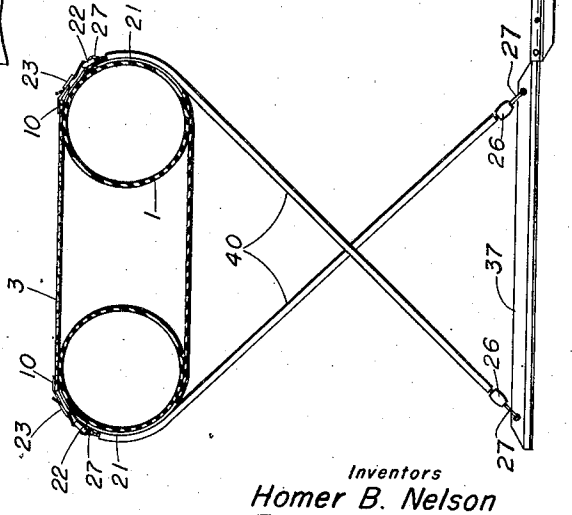


Fig. 13

Fig. 9



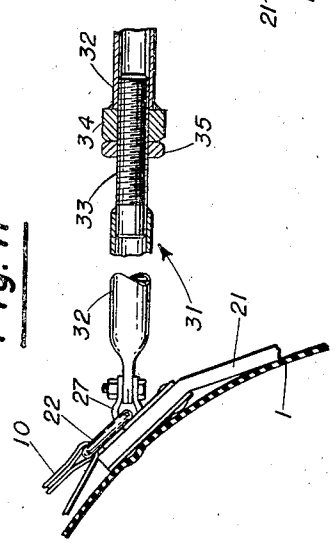


Fig. 11

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UNITED STATES PATENT OFFICE

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FLOATING DOCK AND WHARF

Homer B. Nelson and Frank J. Walters,
United States Navy

Application June 30, 1945, Serial No. 602,646

4 Claims. (Cl. 114—43.5)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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This invention is directed to a floating dock or wharf.

The use of large flying boats has created a demand for a floating dock which can be easily assembled and moved, and which is collapsible so that it can be readily loaded and transported to any desired location by plane.

An object of this invention is to provide a dock suitable for flying boats under conditions of sea and weather in which operation of these craft would be undertaken.

Another object of the invention is to provide a work platform for maintenance of the aircraft, and for transferring freight, personnel, equipment, or even wounded personnel.

Although primarily designed for aircraft, other uses will become apparent.

In the drawings:

Fig. 1 is a plan view of the floating dock or wharf showing the assembly of pontoons or barges;

Fig. 2 is an elevation of the assembly;

Fig. 3 is a plan view of a panel assembly showing the pins between certain of the panel hinges removed;

Fig. 4 is a plan view of the double hinge assembly for the bridging panels;

Fig. 5 is a section on line 5—5 of Fig. 4;

Fig. 6 is a plan view of the single hinge assembly between panels;

Fig. 7 is a section on line 7—7 of Fig. 6;

Fig. 8 shows a cable assembly with the end sections turned at an angle of 90° with respect to each other;

Fig. 9 is a section on line 9—9 of Fig. 1 showing the cross-tie assembly;

Fig. 10 is a section on line 10—10 of Fig. 9;

Fig. 11 shows the strut assembly between the rear bails of the forward pontoons;

Fig. 12 is an enlarged view of the bail connections and panel straps in Fig. 9;

Fig. 13 is a plan view of the bail connections in Fig. 12.

Fig. 1 shows a floating dock wherein pontoons or barges 1 are assembled and secured together to form a U-shape configuration as shown. The legs of the U form a slip adapted to receive a seaplane.

Sectional panel decks are provided for each of the pontoons and bridging panels are provided between the decks, as shown. These are all suitably hinged in a manner to be now described.

The sectional panel deck for each pontoon, as more clearly shown in Fig. 3, is made up of panels 2, 3, and 4 in substantially abutting relationship. Contiguous inner edges are hinged as shown by means of spaced hinges 5, the details of which are shown in Figs. 6 and 7.

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Hinge plates 6 are bolted along the inner edge of each panel in spaced relationship. Opposite plates on contiguous panels are provided with staggered hinge bearings 7 which interdigitate to receive hinge pin 8. The hinge pins in each row of hinges can be easily removed to divide the panel deck for more convenient handling. Fig. 3 shows hinge pins between panels 2 removed. This will divide the deck into two or three panel sections depending on the number of panels used. In the three panel sections there will be two hinged edges. The hinges along one edge are connected to the top surface of contiguous panels and those along the next joining edge are connected to the bottom surface to permit folding of the sections. It will be observed that each of the pontoon's decks shown contain six panels except for the forward pontoon decks in which the first panel is omitted because of the inclined front edge of the pontoon for a purpose later described. The forward center pontoon has four panels. It will be apparent, however, that any number of panels can be used.

The various panels 2, 3 and 4 differ slightly for facility in assembly. End panels 4 are provided with beveled edges. Panels 3 are provided with slots 9 parallel to and spaced from the opposite outer edges of the panel to receive securing straps 10. Panels 2 are provided with notches 11 along the inner contiguous edge spaced inwardly from the outer edge and inwardly of the outer hinges as shown to align with each other when brought into contiguous relationship to form a slot for the securing straps 10. It will be apparent that the panels are easily assembled to form a pontoon deck and are easily broken down and folded one on the other for transportation.

Bridging panels 12 and 13 are provided for bridging between pontoon decks. Bridging panels 12 overlap the edges of panels 2 and 3 in the forward row of pontoons and are detachably connected thereto by means of double hinges, as shown, to permit relative movement between panel decks. Bridging panels 13 are similarly connected between end panels 4 in overlapping and double hinged relationship.

Details of the double hinge construction are shown in Figs. 4 and 5. Hinge plates 14 are secured to the bridging panels and to the edges of the corresponding deck panels. These hinge

plates are provided with hinge bearings 15. Link strap 16 is provided with link bearing 17. These are aligned to receive hinge pin 18. The pins are easily removable for convenient disassembly by removing lockwire 19.

The pontoon supports will now be described.

Pontoons or barges 1 are preferably of the elliptical inflated tube type, although other well known types can be used without departing from the scope of the invention. These pontoons are deflated for convenient transportation and when inflated can be easily secured together in a manner later described. The front pontoons are preferably provided with inclined leading edges 20 for more convenient towing.

Each of the pontoons is provided with spaced lifting straps 21. These straps are usually three in number along each side of the pontoon and are secured to the outer surface of the pneumatic tube. A bail handle connector 22 is secured to the strap 21 by means of suitable plates and bolts as shown in Figs. 12 and 13. These bail handles furnish the necessary support for practically all fastening ties, and constitute connectors used in forming the pontoon assembly.

Lifting straps 21 are symmetrically spaced and are secured to the pneumatic tube of the pontoon at approximate quarter points. The spacing between straps is identical with the spacing between the securing slots 9 and 11 along the outer edges of the sectional panel decking so that the slots can be positioned directly above the pontoon lifting straps. Ordinary web straps 10 in pairs are threaded through the corresponding bail handle 22 and panel securing slots 9 and 11 and tightened by means of buckles 23 to firmly anchor the panel deck to the pontoon as shown in Figs. 12 and 13.

Adjustable tie cables 24 act as bracing between pontoons. Each tie cable preferably is provided with thimbles 25 and clamps 26 at its terminal ends as shown in Fig. 8 for convenient assembly with shackles 27. These tie cables are secured to selected bail handles by means of shackles 27 for proper tying and bracing between pontoons. Each cable is provided with turnbuckle 28 of conventional design for proper adjustment. Loop carrying pads 29 are secured on both sides at the forward end of the center pontoon as shown for securing a set of the diagonal tie cables. Towing or mooring cables 41 may also be secured to these loops.

In the original assembly, struts and transverse tie cables are used to connect the forward row of pontoons together in spaced relationship as shown in Fig. 1. Tie cable 30 is similar to cable 24 with turnbuckle omitted. Each strut 31 is made up of two short lengths of identical tubes 32 with an intermediate screw threaded connector 33 as shown in Fig. 11. A screw threaded nut 34 is welded to the end of one of the tubes and a threaded screw 33 is inserted in the other tube and welded therein. In assembly, the screw of one tube is threaded into the nut carried by the opposite tube and locked in adjusted length by rotating jam nut 35. The tube ends are flattened and secured to opposite bail handles 22 between pontoons by means of suitable shackles 27. These struts are connected between the rear bail handles in the forward row of pontoons to maintain a predetermined spaced relationship and tie cables 30 are secured between the forward bail handles.

Fig. 9 shows the cross tie assembly indicated as 36 to maintain proper spacing between the trailing pontoons which constitute the legs of the U-shaped dock or wharf. It will be apparent that these cross ties must be designed to offer sufficient clearance in the slip between pontoons so as not to interfere with movement of a seaplane into the slip. These cross ties essentially consist of a tubular cross bar made up in sectional lengths 37, 38 and 39 of substantial weight and bolted together as shown in Fig. 10. The tube is sectional to facilitate handling in transportation. Each section may be provided with a web 38' welded thereto as shown for increased rigidity. The cross tie is first assembled then suspended between opposite pontoons by means of cross cables 40 as shown. Each cross cable is provided with thimble 25 at the terminal points and connected at one end to the web of the tube and at the other end to a bail handle by means of suitable shackles 27. The cable is preferably rubber encased for protection against wear. The weight of the bar and length of the cross cables will position the cross ties at a sufficient depth to obtain a clear channel. In the arrangement shown, only two cross ties are required.

It will be apparent that other pontoon arrangements are possible within the scope of the invention; for example, a J arrangement is conceivable. The dock or wharf can be conveniently assembled or disassembled, and the parts are of a size and bulk which make it possible to load all parts in a plane for transportation. The pontoons when inflated and connected by struts, cross ties, and adjustable cables offer adequate support for the sectional panel decking. The sides of the pontoons will offer excellent bumpers for seaplanes and small landing craft which can be tied up alongside.

As previously indicated, tow cables 41 may be connected to the pad loops 29 or may be otherwise connected to either bail handles or cross struts without departing from the scope of the invention. Once towed into position, the dock can be moored to a buoy or anchored in any other desired manner.

The dock may be provided with servicing equipment including gasoline tanks and servicing tools. Where planes are in trouble and in danger of sinking, a rope net may be suspended between the legs of the U to act as a cradle support for the fuselage of the plane and thereby keep it afloat.

While we have shown a particular embodiment of our invention, it will be understood, of course, that we do not wish to be limited thereto, since many modifications may be made, and we, therefore, contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of our invention.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

1. A floating dock comprising pontoons arranged in a substantially U-shaped assembly, connectors on said pontoons, and adjustable tie members between said connectors to connect said pontoons in the desired relationship, a cross tie assembly between pontoons which constitute the legs of the U-shaped assembly and connected to selected connectors, a deck unit on each pontoon, adjustable tie members securing said decks to said connectors, and bridging panels between certain of said pontoon decks.

2. A floating dock comprising pontoons spaced in parallel and trailing relationship, connectors on said pontoons, adjustable tie members and struts between selected connectors to connect said pontoons in desired relationship, rigid cross bars suspended between certain of the pontoon connectors and connected thereto by means of cross cables so that adequate clearance can be maintained for receiving flying boats, a panel deck unit on each pontoon, hinges between said panels to permit folding and disassembly of the deck unit, adjustable tie members securing said deck units to said connectors, and bridging panels between certain of said pontoon decks.

3. A floating dock comprising pontoons spaced in parallel and trailing relationship, connectors along the sides of said pontoons, adjustable tie members and struts between selected connectors to connect said pontoons in desired relationship, rigid cross bars suspended between certain of the pontoon connectors and connected thereto by means of cross cables so that adequate clearance can be maintained for receiving flying boats, a panel deck unit on each pontoon, hinges between said panels to permit folding and disassembly of the deck unit, adjustable tie members securing said deck units to said connectors, bridging panels between certain of said decks and connected thereto by means of double hinges whereby relative movement between pontoons is possible.

4. A floating dock comprising pontoons spaced from each other, connectors attached to each of said pontoons, adjustable tie members and struts between selected connectors to secure said pontoons together in substantially parallel and trailing relationship, substantially rigid cross bars suspended between certain of the pontoon connectors by means of cross cables so that adequate clearance can be maintained to receive flying boats, a panel deck unit on each pontoon, hinges between said panels to permit folding and disassembly of the deck unit, adjustable tie members securing said deck units to said connectors, bridging panels overlapping certain of the contiguous edges of said deck units and secured thereto by means of double hinge elements whereby relative movement between said pontoons is possible.

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The following references are of record in the file of this patent:

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