May 14, 1940. J. B. TEMPLETON 2,200,661

BARGE

Filed April 11, 1938 2 Sheets-Sheet 1

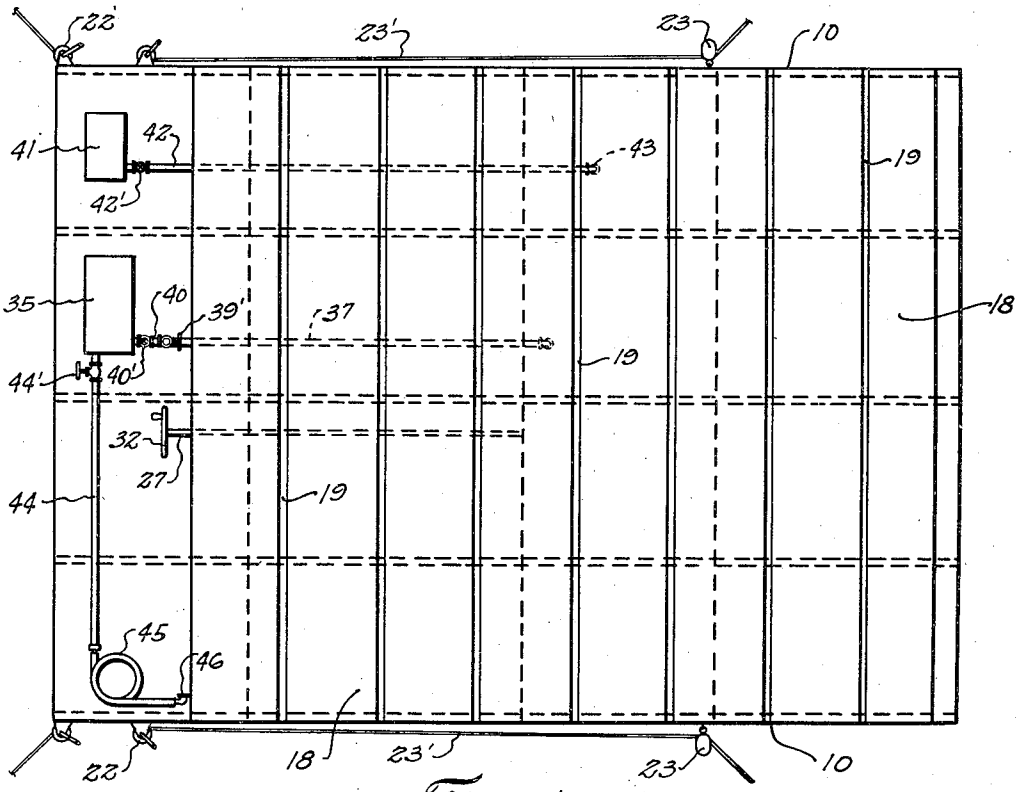


Fig. 1.

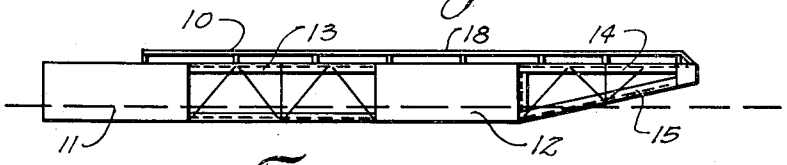


Fig. 2.

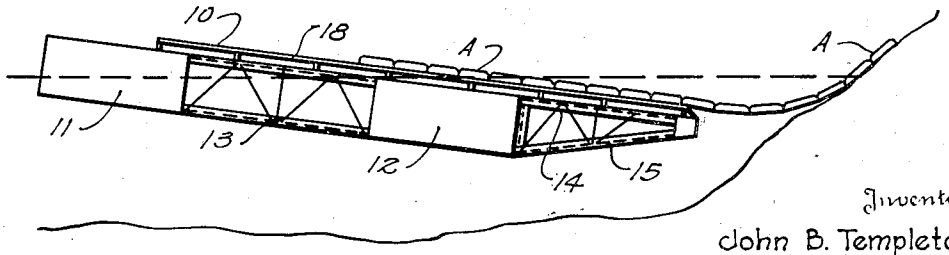


Fig. 3.

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BARGE

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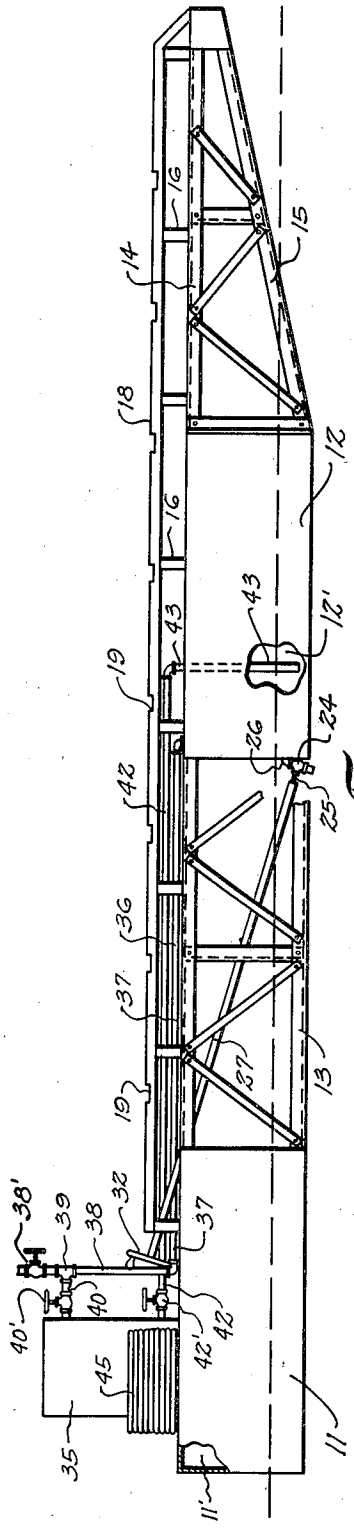


Fig. 4.

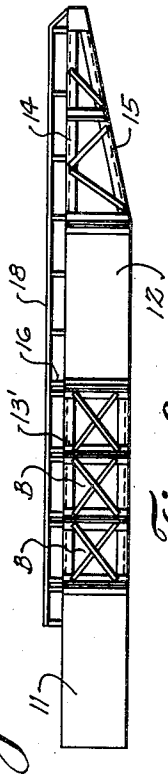


Fig. 8.

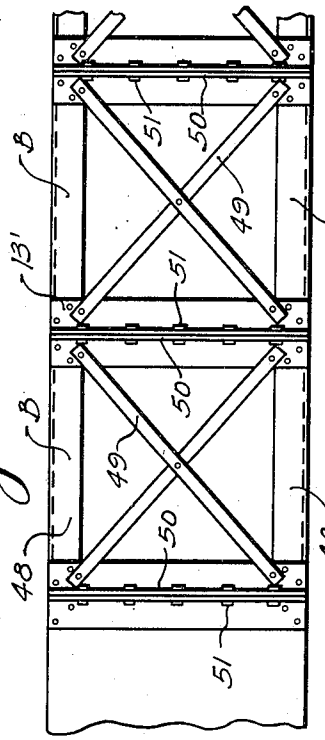


Fig. 9.

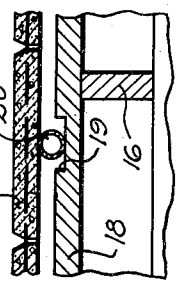


Fig. 7.



Fig. 5.

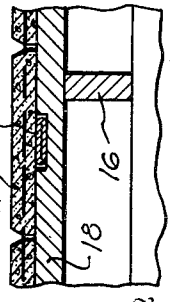


Fig. 6.

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Patented May 14, 1940 2,200,661

UNITED STATES PATENT OFFICE

2,200,661

BARGE

John B. Templeton, Dallas, Tex.

Application April 11, 1938, Serial No. 201,309

4 Claims. (Cl. 114—27)

This invention relates to new and useful improvements in barges.

One object of the invention is to provide an improved barge arranged to have one end submerged to incline the deck of said barge when it is desired to discharge an object from said deck.

Another object of the invention is to provide an improved barge arranged to accommodate the formation and transportation of concrete slabs or revetment mats and having means for submerging one end of said barge, whereby a mat may be discharged and laid in position upon the bank of a river or other body of water to prevent said bank from being eroded or washed away by the current of the water.

A particular object of the invention is to provide an improved barge having a plurality of spaced air chambers for supporting the barge upon the surface of the water, one of the chambers being arranged to be filled with water, whereby one end of the barge may be submerged when it is desired to discharge an object from the deck thereof, said barge being provided with means for forcing the water out of said chamber and filling the same with air, whereby the barge may be raised to its original position.

Still another object of the invention is to provide an improved barge of the character described having a deck so arranged that a large concrete revetment mat may be poured and hardened thereupon, the deck having provision for housing deflated lengths of hose, whereby when the mat has hardened sufficiently the lengths of hose may be inflated and be used as rollers to facilitate in moving the mat off of the submerged end of the deck and barge.

A further object of the invention is to provide an improved barge of the character described which is made in sections immovably fastened together, whereby the length of the barge may be increased or decreased by removing or inserting the sections.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is a plan view of a barge constructed in accordance with the invention,

Figure 2 is a reduced side elevation of the barge in its normal or floating position,

Figure 3 is a similar view showing the barge with its forward end submerged,

Figure 4 is an enlarged side elevation of the barge,

Figure 5 is a partial elevation of one of the pneumatic lifting members,

Figure 6 is a partial vertical, sectional view taken through the deck, and showing one of the pneumatic members in a deflated position,

Figure 7 is a similar view with the member inflated,

Figure 8 is a side elevation of a barge wherein the pontoons are connected by a sectional structure, and

Figure 9 is an enlarged elevation of two of the sections which connect the pontoons.

In the drawings, the numeral 10 designates a barge having a pair of transverse pontoons or floating platforms 11 and 12 which include air chambers or tanks 11' and 12', respectively, of sufficient area to support the barge upon the surface of the water. The pontoon 11 forms the stern of the barge and is parallel to and connected to the pontoon 12 by a connecting structure 13 which is formed of suitable members and braces, whereby the pontoons are spaced from each other. A plurality of longitudinally extending bow trusses 14 are secured to the forward end of the pontoon 12 so as to form the bow of the barge. The trusses 14 are elongated and are provided with inclined lower edges 15 which have a gradual forward rise, whereby the bow of the barge may overhang a bank or shore having a gradual slope. The structure 13 and trusses 14 are constructed of light structural steel or other suitable material, whereby the weight of the barge is materally less than the usual barge. A plurality of transverse joists or beams 16 are mounted upon the tops of the pontoon 12, structure 13 and trusses 14 and upon a portion of the upper surface of the pontoon 11, whereby an elongate, flat deck 18 may be supported thereon. The deck 18 is thus spaced above the pontoons 11 and 12, structure 13 and trusses 14 by the joists 16, as is clearly shown in Figure 4.

A plurality of shallow transverse grooves or channels 19, substantially rectangular in cross-section, are provided in the upper surface of the deck 18 and extend parallel to one another. Each groove 19 is arranged to receive a flexible tubular hose or inflatable member 20, which may consist of lengths of ordinary fire hose. Each member 20 has its ends closed by flanged caps 21 and one of said caps is provided with a suitable valve 21' which is axially disposed therein, where-

by said member may be inflated by forcing air through said valve, or may be deflated by exhausting the air through the valve 21'. When the members 20 are deflated and flattened, as shown in Figure 6, they will lie within the grooves 19 flush with the surface of the deck 18. However, upon inflation, the members will expand and extend above the surface of the deck, as is clearly shown in Figure 7, and thus raise any object which may be resting upon said deck. The grooves 19 are just deep enough to accommodate the deflated members, and are, therefore, sufficiently shallow to permit each member to be rolled from its groove when said hose is inflated. It is noted that the grooves 19 may be omitted if desired, whereby the members 20 may rest upon the surface of the flat deck. The usual sheaves or hand crabs 22 and cable blocks 23 which are arranged to receive the ordinary guy lines 23' are provided on the sides of the barge, whereby the barge may be held in control while launching the mattress, with the upper end of the mattress being anchored on the bank, as will be explained.

A suitable valve 24, having an actuating stem 25, is disposed adjacent the bottom and at one side of the pontoon 12 and communicates with the chamber 12' by means of a short pipe 26, whereby, when the valve is opened, said chamber may be filled with water to submerge the forward end or bow of the barge (Figure 3). An elongate inclined shaft 27 has one end secured to the stem 25 of the valve and said shaft extends through the connecting structure 13, as is clearly shown in Figure 4. The shaft is suitably supported in bearings mounted on the structure 13 and the upper end of the shaft terminates at the rear of the deck 18 above the pontoon 11. This upper end of the shaft is provided with a hand wheel 32 and when the wheel 32 is rotated, the shaft 27 is rotated to operate the valve 24 which may be opened or closed from the surface of the pontoon 11 behind the deck 18.

An air compressor 35 is mounted upon the rear of the pontoon 11 and communicates with the air chamber 12' of the forward pontoon 12 by means of an air line 36 which extends from the upper end of said chamber. The air line includes a tubing or pipe 37 which has one end connected to the chamber 12' and its opposite end communicating with a vertical pipe 38. A suitable T 39 provided in the pipe 38 near its upper end, is arranged to receive one end of a short horizontal pipe 40 which extends from the upper end of the compressor 35 to complete the air line (Figure 4). A manual control valve 40' is mounted in the pipe 40, while a similar valve 38' is disposed in the pipe 38 above the T 39. It is noted that the pipe 40, T 39, pipe 38 and tubing 37 provide communication between the compressor to said chamber may be regulated by manipulation of the valve 40'. The valve 38' is provided as an air outlet, whereby the pressure may be relieved or reduced within the chamber 12' when it is desired to fill the same with water preparatory to submerging the forward end of the barge 10.

A suitable pump 41 is positioned upon the pontoon 11 adjacent the compressor 35 and is connected to the air chamber 12' by a pipe 42 which extends from the pump to the upper end of said chamber. The forward end of the pipe 42 communicates with a vertical stand pipe 43 by means of an elbow, said stand pipe extending into the interior of the chamber, as shown in Figure 4, whereby the pump 41 may be utilized to pump water from said chamber as will be hereinafter explained. The pipe 42 is provided with a hand valve 42' located adjacent the pump (Figure 1), whereby the flow through the pipe may be regulated as desired.

An elongate pipe 44, having a manual valve 44' connected therein, extends from one side of the compressor 35 and transversely across the pontoon 11, said pipe having a flexible hose or tubing 45 of sufficient length to reach past the bow of the barge and when not in use may be kept coiled up in one corner of the aforesaid pontoon, as shown in Figures 1 and 4. A suitable nozzle 46 is mounted on the free end of the hose 45, whereby said hose resembles an ordinary air hose and may be used to inflate the pneumatic members 20. By opening the control valve 44' and placing the nozzle 46 on the valves 21' provided in the caps 21 in succession, the members 20 may be readily inflated within a short period of time by the air from the compressor 35. It is pointed out that the members 20 may, if desired, be inflated with water, or other fluid, and that the use of air as an inflating medium is not essential.

In actual size, the barge 10 is towed to a point where the shore or bank is being washed away by the current of the water or which may be subject to the eroding effect of the current in the near future. Suitable forms (not shown) having been set up on the surface of the deck 18, a concrete revetment mat or protective covering A is poured between the forms (not shown) and allowed to set until substantially hard. When the mat A has hardened sufficiently and the forms (not shown) removed, the pneumatic members 20 are inflated by means of the air hose 45, as hereinbefore set forth, which will raise said mat above and away from the surface of the deck 18.

When the mat is supported upon the members 20, the valve 38' is opened to exhaust most of the air from the chamber 12' of the pontoon 12. At the same time, the valve 24 is opened by rotating the shaft 27 through the medium of the hand wheel 32, whereby water is admitted into the interior of the chamber 12' through said valve. The forward end or bow of the barge will begin to settle and when the chamber 12' is substantially full, the bow of the barge will be submerged as shown in Figure 3. It is noted that the trusses 14 will be completely beneath the surface of the water and that the pontoon 12, structure 13 and pontoon 11 will be partially submerged in lessening degrees. It is obvious that the air-filled chamber 11' will support the barge in this submerged position, whereby the deck 18 will be tilted or inclined. When the barge is in this position, the inclination of the deck will facilitate the removal of the mat A therefrom. It is noted that the elongated trusses 14 with their inclined lower edges 15 will permit the bow of the barge to overhang a bank or shore having a gradual slope, whereby the mat may be discharged from the deck and readily placed upon the shore without damaging or injuring said mat.

Any suitable means may be employed for removing the mat from the deck 18, but it is preferable to anchor or secure the forward end of the mat to a bank or shore and back the barge away from said bank or shore, whereby said mat may be rolled off of the inclined deck by means of the members 20 which serve as rollers.

After the mat has been removed from the deck, the valve 38' is closed and the valve 40' opened

to force air through the line 36 and into the chamber 12', whereby the water therein is forced out through the valve 24. When all of the water has been expelled from the chamber, the barge will have been raised to its normal or original position as shown in Figure 2, at which time the valve 24 may be closed. It is noted that, if desired, the end of the mat may be retained upon the barge and the forms (not shown) replaced so that another mat may be poured upon the deck and secured to the end of the first mat, whereby said mat may be made of any desired length

The pump 41 and its communicating pipe 42 is provided so that the water may be pumped from the chamber 12' instead of forcing the water therefrom by air. In this event, the valve 24 is closed and the valve 42' regulated as desired and then the pump 41 is started, whereby the water within said chamber is drawn up through the stand pipe 43, into the pipe 42, and out through said pump. Thus, an auxiliary means of removing the water from the chamber is provided in case the air compressor fails to function properly or the air line 36 or chamber 12' develops a leak. When all of the water has been removed from the chamber, the barge will again float upon the surface of the water, whereby another revetment mat may be made upon the deck of said barge as soon as the forms (not shown) can be replaced and positioned thereon.

From the foregoing, it will be seen that the barge may be readily tilted or inclined to permit removal of the mat. The use of the inflatable members provides a positive means of lifting or raising the mat from the surface of the deck and, after said mat is lifted, the members are utilized as rollers, which greatly facilitates removal of the mat. Although the inflatable members are shown as mounted within shallow grooves 19, it is obvious that said grooves may be eliminated and said members supported on the flat surface of the deck.

When the connecting structure 13 is employed for connecting the pontoons 11 and 12, the barge is of a fixed size and its length cannot be varied without removing the entire structure and substituting a different size structure therefor. It may be desirable in some instances to change the size of the barge and in such case, a connecting structure 13', as shown in Figure 8, is provided. The structure 13' includes a plurality of structural sections B which have their vertical edges fastened together. Each section consists of a frame 48 which is substantially square and which is reinforced by diagonal crossed braces 49 having their crossed portions secured to each other by suitable means. The frames 48 have outwardly directed flanges 50 at their vertical meeting edges, which are fastened together by bolts and nuts 51 to connect the sections. The longitudinal joists 16 and deck 18 are also constructed in sections having the same length as the sections A and being fastened together in a similar manner. With this arrangement, any one of the sections may be removed to shorten the distance between the pontoons, whereby a shorter barge is had. Similarly, another section may be added to lengthen the barge.

When the connecting structure is formed of the sections B, the shaft 27, air tubing 37 and pipe 42, may be made in sections so as to be readily varied in length, or said parts may be removed and similar parts having a different length substituted therefor. The use of a sectional connecting structure makes it possible to vary the length of the barge without replacing the entire connecting structure.

The description which has been given recites more or less detail of a particular embodiment of the invention, which is set forth as new and useful; however, I desire it understood that the invention is not limited to such exact details of construction, because it is manifest that changes and modifications may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A barge for laying revetment mats including, spaced pontoons, longitudinal members connecting the pontoons together, and a relatively flat deck supported by the pontoons and members for accommodating the formation of a revetment mat, the deck and members being made in removable sections of equal length, whereby the barge may be decreased in length by removing deck and member sections to accommodate the formation of a short mat and may be increased in length by inserting additional sections to accommodate the formation of a longer mat.

2. A barge for laying revetment mats including, a pair of spaced pontoons, a sectional frame connecting and holding the pontoons together, and a relatively flat deck supported by the pontoons and frame for accommodating the formation of a revetment mat, the deck being made in sections equal in length to the frame sections, whereby the length of the barge may be varied by employing more or less frame and deck sections so as to accommodate the formation of mats of various sizes.

3. A barge for laying revetment mats including, a relatively flat deck for accommodating the formation of a revetment mat, a buoyant body having means for partially submerging it to incline the deck, a plurality of elongate, hose-like, deflatable roller members on said deck, and means for inflating the members to the form of rollers for lifting the mat from above the surface of said deck and aiding in the displacement of said mat from said inclined surface.

4. A barge for laying revetment mats including, a relatively flat deck for accommodating the formation of a revetment mat, a buoyant body having means for partially submerging it to incline the deck, a plurality of elongate, hose-like deflatable roller members on said deck, said deck having means for housing the members so that when deflated they will be substantially flush with the upper surface thereof, and means for inflating the members to the form of rollers for lifting the mat from above the surface of said deck and aiding in the displacement of said mat from said inclined surface.

JOHN B. TEMPLETON.