Feb. 12, 1946. G. G. GREULICH 2,394,764

METAL PONTOON

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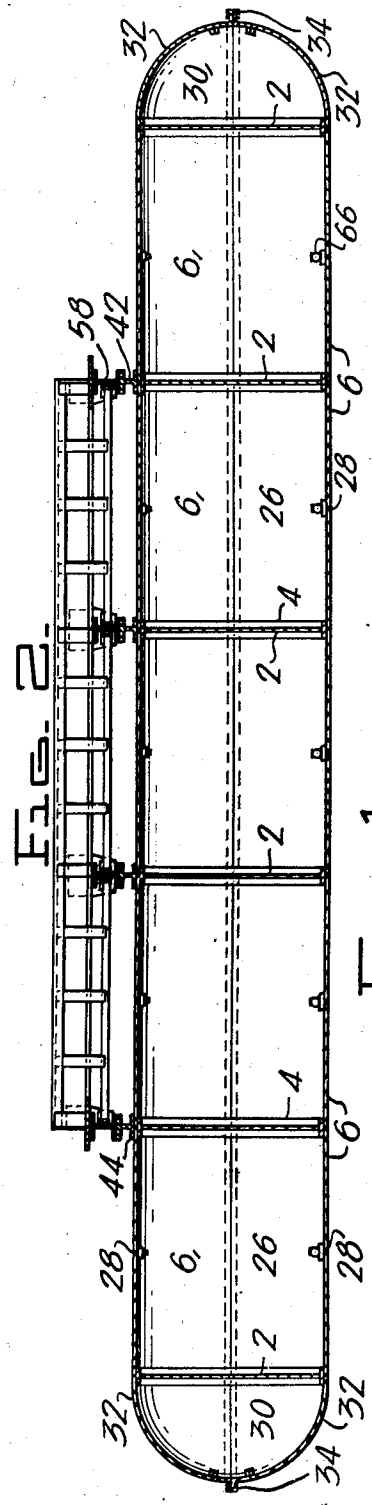


FIG. 2.

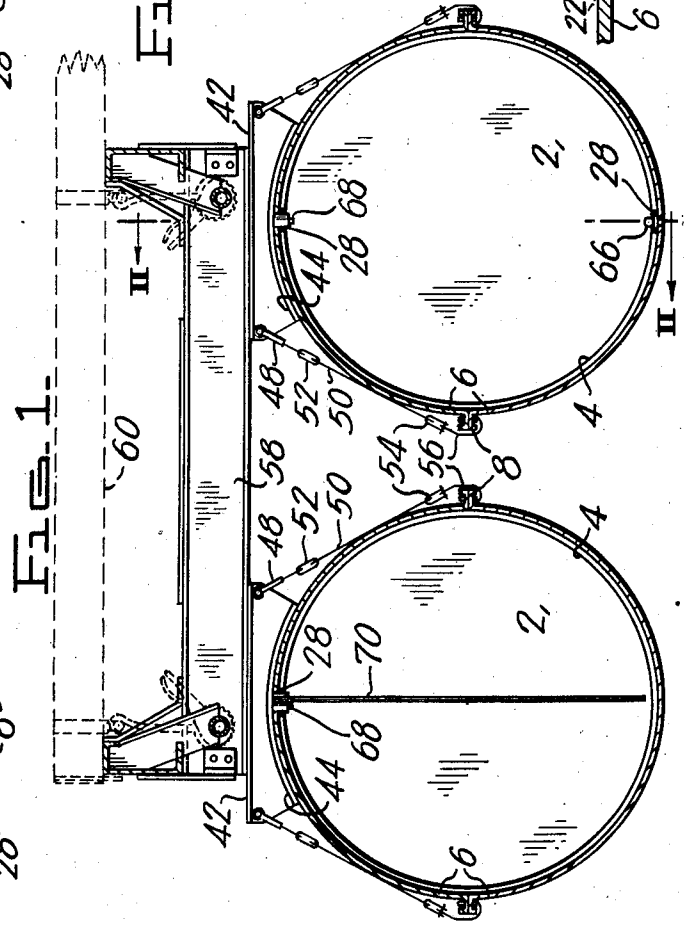


FIG. 1.

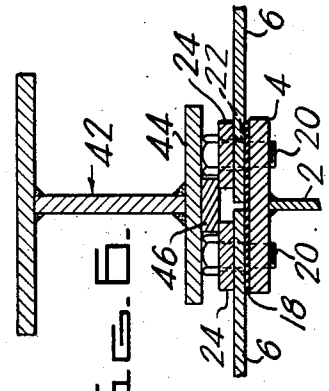


FIG. 6.

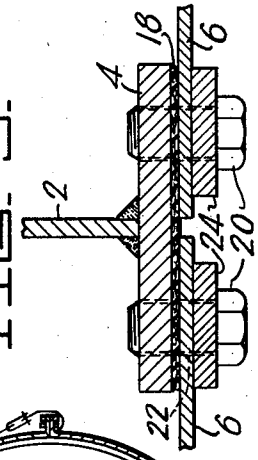


FIG. 3.

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Fig. 4.

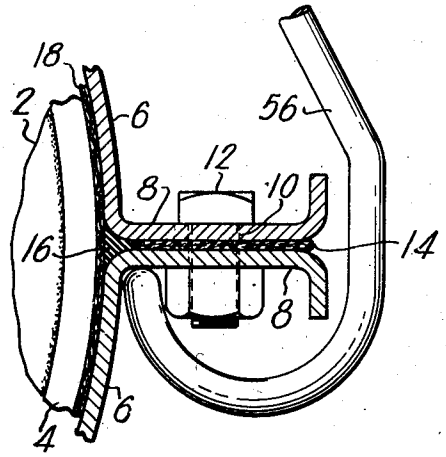


Fig. 5.

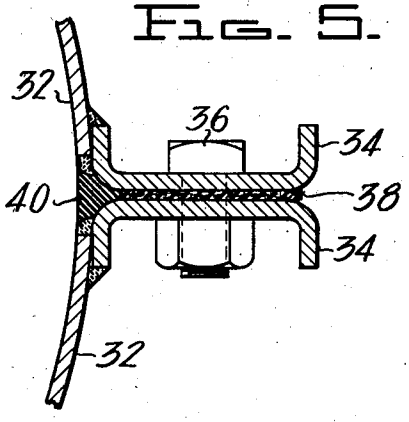


Fig. 7.

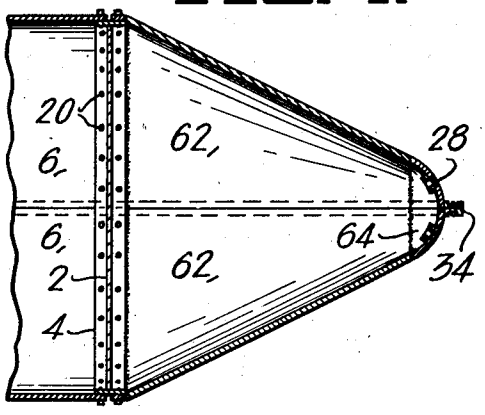
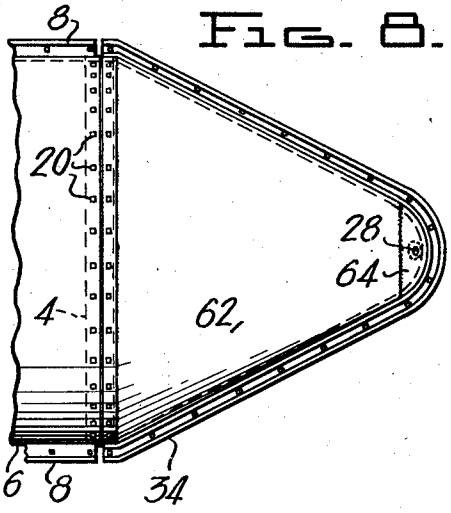


Fig. 8.



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UNITED STATES PATENT OFFICE

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METAL PONTOON

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Application March 16, 1944, Serial No. 526,783

6 Claims. (Cl. 114—0.5)

This invention relates to metal pontoons for pontoon bridges and the like which are extensively used in time of war. The ordinary pontoon for pontoon bridges is made in one piece and must be assembled at a point remote from the place of use. In transport, the pontoons are easily recognized from the air and are subject to attack by enemy planes. The bulk of the pontoons is large and the shipping space required is very great.

It is an object of my invention to provide a pontoon which is made in demountable sections.

Another object is to provide a pontoon which can be assembled near the place of use.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a cross sectional view of two pontoons with saddle supports and flooring secured thereto;

Figure 2 is a longitudinal cross section on line II—II of Figure 1 drawn to a smaller scale;

Figures 3 to 6 show various details of the invention;

Figure 7 is a vertical section of an alternate end section for the pontoon; and

Figure 8 is a plan view of Figure 7.

Referring more particularly to the drawings, the reference numeral 2 indicates a solid diaphragm made from a steel plate. As best shown in Figures 2 and 3, a rim 4 is welded to the periphery of the diaphragm 2. The casing of the pontoon is made from a plurality of semi-cylindrical sections 6, each of which has a flange 8 along its longitudinal edges. As shown in Figure 4, flanges 8 are provided with holes 10 therein and abutting flanges are fastened together by means of bolts 12. Cotton webbing 14 impregnated with rubber compound is provided between the flanges and rubber caulking compound 16 is inserted at the diaphragm rings. The edges of the semi-cylindrical sections 6 rest against the rim 4 as best shown in Figures 2 and 3. Cotton webbing 18, impregnated with rubber compound, is inserted between the rim 4 and the sections 6 which are fastened to the rim 4 by means of stud bolts 20. Slotted holes 22 are provided in the sections 6 to provide ease of the assembly while corresponding holes in rim 4 are threaded to receive the bolts 20. Lock washers 24 are located between the sections 6 and the head of the stud bolts 20. A plurality of these semi-cylindrical sections 6 bolted to the rims 4 are assembled as shown in Figure 2. Each compartment 26 is provided with a bung hole 28 at top and bottom. The end compartments 30 of the pontoon are made in the form of a hemisphere which is formed of two sections 32 fastened together as shown in Figure 5. A semi-circular U-shaped member 34 is welded to each section 32 and the two sections are bolted together by means of bolts 36. Cotton webbing 38 impregnated with rubber compound is inserted between the members 34 and rubber caulking 40 is inserted at the diaphragm rings. In assembling the pontoon the ends of the curved cylindrical halves are placed in contact with the rimmed diaphragms and the cap screws 20 are partially inserted, after which the flanges 8 and 34 are loosely bolted together. After all cap screws and bolts are in place, they are gradually drawn up to the required tightness. It will be seen that the entire pontoon is assembled with fastenings applied from the outside, which facilitate assembly. If desired, the casing, instead of being made from cylindrical halves, may be made up of any number of curved pieces having flanges similar to flanges 8 and which may be assembled to form the cylindrical casing.

Welded saddles 42 are fastened to the top of the pontoon so as to be supported by the diaphragms 2. The load from the saddles act directly on the diaphragms 2 and distortion is prevented by the diaphragms acting in tension. The stresses set up by outside water pressure is in large part carried by the diaphragms which stiffen the entire structure. The bottom flange 44 of the saddle is bent to conform to the shape of the pontoon. A bent bar 46 is welded to the bottom of the flange 44 beween the bolt heads to provide bearing for the saddle as shown in Figure 6. Each of the saddles is fastened to the flanges 8 by means of a clevis 48 fastened to each end of the saddle as best shown in Figure 1. A tie rod 50 having a turn buckle 52 connects the clevis 48 to a clevis 54, attached to a clamp 56 which engages the bottom of the flange 8. Standard flooring supports 58 and flooring 60 are bolted to the saddles 42 as shown in Figures 1 and 2.

In place of the hemispherical ends 30 a conical end section 62 may be used as shown in Figures 7 and 8. A spherical segment 64 is welded to the conical section and the two halves of the conical section are fastened together as shown in Figure 5. The streamlining effect of the spherical and conical sections offers a minimum opportunity for lodgment of floating debris, keeps down the resistance to movement through the water when towing, and reduces the pulling on the anchor lines from current against the upstream and current drag on the downstream end. If

desired, towing eyes may be attached to the bung holes 28 at the ends of the pontoon.

Alternate schemes for removing seepage water from the compartments are shown in Figure 1. As shown on the right hand pontoon, a check valve 66 is screwed into the bung hole 28 and an air valve 68 is screwed into the diametrically opposite bung hole 28. To remove water or other liquid from the compartments of the pontoon, pressure is applied at the air valve 68 to force the water out through the check valve 66. In the alternate construction shown to the left in Figure 1, an air valve 68 and bleeder pipe 70 are attached to the bung hole 28. The bleeder pipe extends to the bottom of the pontoon and by applying pressure to the air valve, water is forced up through the bleeder pipe and out of the compartment.

By making the pontoon in separable parts, which can be nested one within the other, great savings in shipping space is permitted. Standard transportation equipment may be used and the character of the load is not apparent to aerial reconnaissance.

In case of damage to one pontoon, it may be released from the saddle, floated out of position and replaced by a new cylinder floated into position when partly filled with water and then brought up into position by blowing out the water.

While several embodiments of the invention have been shown and described, it will be apparent that other modifications and adaptations may be made without departing from the scope of the following claims.

I claim:

1. A metallic pontoon comprising a plurality of diaphragms extending transversely of and spaced apart longitudinally of the pontoon, a plurality of cylindrically curved members, a longitudinally extending flange at each longitudinal edge of each member, said curved members being fastened together in groups to form a cylinder with their flanges abutting, each group of members extending between a pair of diaphragms with their ends being fastened thereto at the periphery thereof, a streamlined section fastened to each end of the pontoon, load supporting saddles mounted on the pontoon at positions coincident with certain of said diaphragms, and means anchoring said saddles to said flanges.

2. A metallic pontoon comprising a plurality of diaphragms extending transversely of and spaced apart longitudinally of the pontoon, a plurality of semi-cylindrical members, a longitudinally extending flange at each longitudinal edge of each member, said semi-cylindrical members being fastened together in pairs to form a cylinder with their flanges abutting, each pair of members extending between a pair of diaphragms with their ends being fastened thereto at the periphery thereof, load supporting saddles mounted on the pontoon at positions coincident with certain of said diaphragms, and means anchoring said saddles to said flanges.

3. A metallic pontoon comprising a plurality of diaphragms extending transversely of and spaced apart longitudinally of the pontoon, a plurality of semi-cylindrical members, a longitudinally extending flange at each longitudinal edge of each member, said semi-cylindrical members being fastened together in pairs to form a cylinder with their flanges abutting, each pair of members extending between a pair of diaphragms with their ends being fastened thereto at the periphery thereof, a streamlined section fastened to each end of the pontoon, means for removing liquid from the interior of the pontoon, load supporting saddles mounted on the pontoon at positions coincident with certain of said diaphragms, and means anchoring said saddles to said flanges.

4. A metallic pontoon comprising a plurality of diaphragms extending transversely of and spaced apart longitudinally of the pontoon, a peripheral ring on said diaphragm, a plurality of semi-cylindrical members, a longitudinally extending flange at each longitudinal edge of each member, said semi-cylindrical members being fastened together in pairs to form a cylinder with their flanges abutting, each pair of members extending between a pair of diaphragms with their ends being fastened to the peripheral rings, a streamlined section fastened to the ring at each end of the pontoon, load supporting saddles mounted on the pontoon at positions coincident with certain of said diaphragms, and means anchoring said saddles to said flanges.

5. A metallic pontoon comprising a plurality of diaphragms extending transversely of and spaced apart longitudinally of the pontoon, a peripheral ring on each diaphragm, a plurality of semi-cylindrical members, a longitudinally extending flange at each longitudinal edge of each member, said semi-cylindrical members being fastened together in pairs to form a cylinder with their flanges abutting, each pair of members extending between a pair of diaphragms with their ends being fastened to the peripheral rings, a streamlined section fastened to the ring at each end of the pontoon, means for removing liquid from the interior of the pontoon, load supporting saddles mounted on the pontoon at positions coincident with certain of said diaphragms, and means anchoring said saddles to said flanges.

6. A metallic pontoon comprising a plurality of diaphragms extending transversely of and spaced apart longitudinally of the pontoon, a plurality of cylindrically curved members, a longitudinally extending flange at each longitudinal edge of each member, said curved members being fastened together in groups to form a cylinder with their flanges abutting, each group of members extending between a pair of diaphragms with their ends being fastened thereto at the periphery thereof, load supporting saddles mounted on the pontoon at positions coincident with certain of said diaphragms, and means anchoring said saddles to said flanges.

GERALD G. GREULICH.