June 16, 1931. W. G. ESMOND 1,810,310

BULKHEAD FOR STEEL BARGES

Filed Oct. 29, 1927

Fig. 1

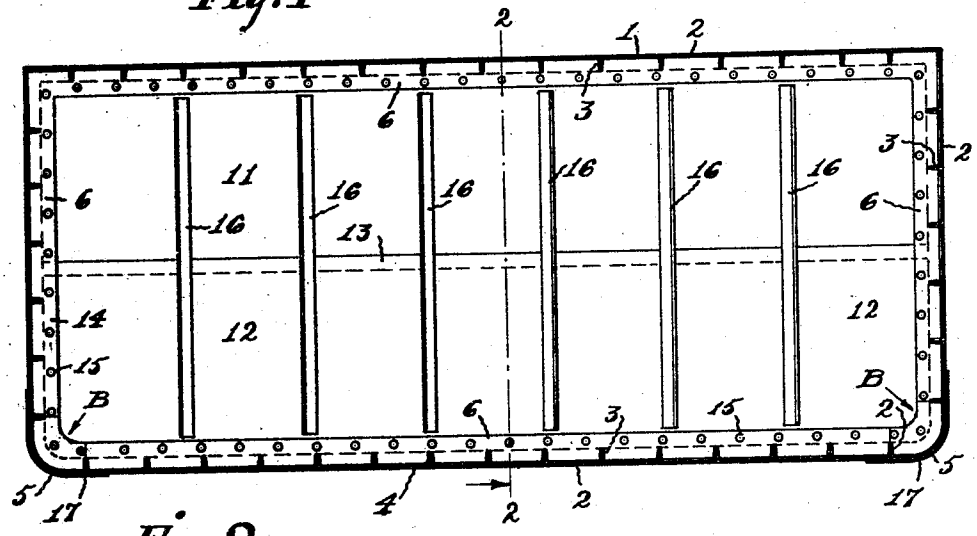


Fig. 2

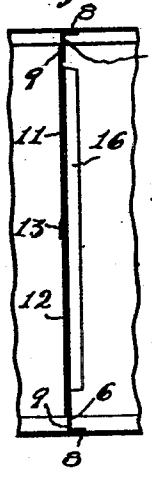


Fig. 3

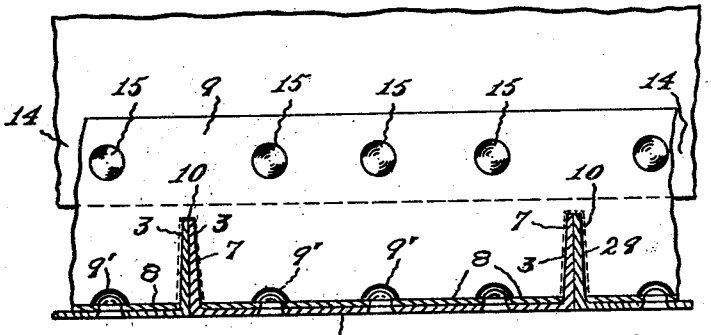


Fig. 4

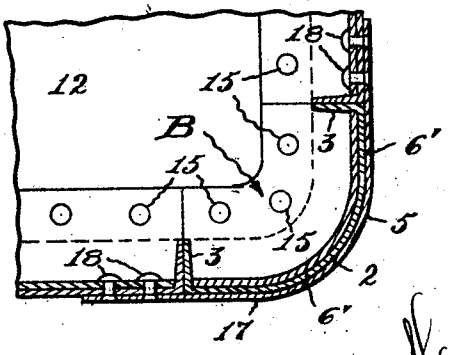
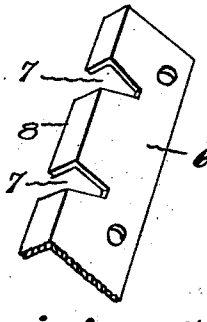


Fig. 5



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Patented June 16, 1931 1,810,310

UNITED STATES PATENT OFFICE

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BULKHEAD FOR STEEL BARGES

Application filed October 29, 1927. Serial No. 229,669.

My present invention relates to an improvement in steel barges of the type set forth in my copending patent application for steel barge construction, Serial No. 229,668 filed Oct. 29, 1927, and it more specifically relates to the construction of bulkheads and framing, within the barge structure, whereby to frame and divide such barges into a plurality of compartments and to act as transverse stiffeners therefor.

One of the main advantages of my present construction is an improvement in the details whereby such bulkheading is affixed to and collaborates with the framing of the barge, and whereby greater economy in the building of the same is accomplished, than by present methods.

The above noted economy is accomplished mainly by the fact that the present new construction obviates the use of forged collars heretofore utilized to form framing between the channel flanges, each of such collars having to be made and fitted separately owing to non-uniformity of the channel spacing, such non-uniformity ordinarily requiring the making of separate templets for each channel collar after the hull structure is erected. This, obviously, is very expensive and my present construction eliminates this.

In barges of the present type it is highly desirable, so far as is possible, that standard structural shapes be utilized in the building thereof, with a minimum number of special pieces, on the ground of economy in the labor cost of manufacture, and a saving in the cost of material entering into such structure.

These and other capabilities will be ascertained as the herein description proceeds, and it is obvious that modifications thereof may be made without departing from the spirit of the invention or the scope of the appended claims.

In the accompanying drawings:

Fig. 1 is a transverse sectional view of a steel barge of the type herein referred to, showing the bulkhead.

Fig. 2 is a sectional view thereof taken on the line 2—2, Fig. 1, looking in the direction of the arrow.

Fig. 3 is an enlarged characteristic section in fragmentary form, taken from any part of the framing structure of the barge hull, Fig. 1.

Fig. 4 is an enlarged section of the bilge portion in enlarged fragmentary view.

Fig. 5 is a fragmentary perspective view of one of the bulkhead frames.

In my present construction all of the component parts of my present invention utilize, so far as is possible, standard structural shapes for the construction of barges of this type, such as is set forth in United States Patents Nos. 1,596,723 and 1,647,155, issued to Ellis on Aug. 17, 1926, and Nov. 1, 1927, respectively, and as a continuation of this, I have utilized certain standard structural iron shapes, as will be hereinafter fully disclosed, for the construction of bulkheads within a vessel of the type described.

For instance, in Fig. 1, the deck 1 is shown as being constructed of channel sections or beams 2 riveted together at their flanges 3, and the opposite sides of the vessel are similarly constructed, as indicated by similar indices thereon, as is also the bottom, generally denoted by 4.

The bilge portions 5 of the hull, as will be noted by examination of the enlarged fragmentary portion of Fig. 4, are also similarly constructed except that the channel beams 2, as previously described, are bent so that its flanges 3 are brought at right angles to one another by bending the web portion 6, Fig. 4, to conform to the bilge bend, as shown.

In the construction of my bulkhead within the hull of a vessel constructed of channel shapes, or beams as above described, for the purpose of providing an anchoring frame for the bulkhead forming metal sheets, I utilize, as is shown in Fig. 2, angle frames, generally denoted by 6, these angles being preferably of unequal legs, and as shown in Fig. 5 the shorter legs of these angles are slotted at channel-flange spaced intervals so as to permit of the introduction of the

flanges 3 along the length of the angle members 6, these slots 7 being extended into the longer leg 9 thereof, as indicated in the fragmentary view, Fig. 3. The short interrupted flange 8 of the angle rests against and is riveted to the webs of the channel beams while the longer flange 9 projects angularly away therefrom, this being fully indicated in Fig. 3.

After the slotting and fitting of the angle frames 6 to the respective positions and channels 2, for locating the bulkhead plates, the short leg 8 of the angle is rivets 9′, Fig. channel webs 2 by means of rivets 9′, Fig. 3. The slotted openings 7 in frames 6, into which are introduced the upstanding flanges 3 of the channels, are then welded to the flanges 3 at their points of contact, as indicated by the dotted lines 10 in Fig. 3 so that the slotted bulkhead angle frames 6 are welded, at intervals, to the flanges 3 of the channels 2 and by such welding the slotted jointures are made into an integral and watertight construction.

After the frames 6 have been placed in position, riveted and welded, as above described, the bulkhead plates 11 and 12 are then placed in position, they being overlapped at their mid section as at 13, in some instances, and the outer edges 14 of the said plates are then riveted to the long leg 9 of the angle frames 6 by means of rivets 15, this detail being fully shown in Fig. 3.

Thereafter, for the purpose of stiffening the bulkhead plates against bulging in either direction, they are stiffened by the riveting thereto of a plurality of vertical standard angle bars 16, Figs. 1 and 2, these running substantially from the deck framing to the bottom framing of the barge and thereby stiffening the transverse bulkhead forming plates 11 against undue displacement.

At the bilge portion B of the hull structure, Figs. 1 and 4, it will be noted that the angle frame there noted is curved to fit the bent bilge forming channel beams 2, the said bilge forming channels being affixed to their associate hull forming channels 2, as previously described. The bilge forming angle frame piece B is a separate piece of angle framing bent as previously described, and is thereafter riveted, as by rivets 15, to the bulkhead plates 12, and is also welded to the flanges of the hull forming channels. An outer bilge reinforcing plate 17, bent to conform to the shape of the web 6′ of the bilge channel beam, is affixed to the bilge associated channel beams by rivets 18. Thus the bilge portion is reinforced at this point and cooperates with the interior angle framing members 6 at the sides and bottom of the barge to encompass a rigid bilge construction and at the same time acts as a corner anchorage for the bulkhead plates 12.

It will be noted from the foregoing that in the bulkhead construction there are only three structural elements used, namely, the framing 6 which is notched and welded to the longitudinal hull forming channel beams 2, the transverse bulkhead forming plates 11 and 12 and the bulkhead plate reinforcing angles 16. It will further be noted that owing to this construction that the bulkhead plates themselves are integrally affixed, through the angle frames 6 to the hull forming channel beams in a rigid manner, by reason of the welding and riveting, thereby transversely reinforcing the hull structure of the vessel, and that the bulkheads are in turn reinforced by the vertical angle braces 16 thereby creating, at intervals, throughout the longitudinal length of the barge proper, a series of transverse hull reinforcing watertight compartment forming members which involve a very simple construction and admit of the practice of a greater economy in the construction of bulkheads, than heretofore accomplished by customary practice.

I claim:

1. A bulkhead for barges of the class described, comprising in combination with a flanged channel beamed hull, of a framing therefor, said framing having spaced notches to receive the flanges of said channels and being welded to said channel flanges at their points of notched contact therewith, and having bulkhead forming partitions affixed thereto, said bulkhead partitions being provided with vertical stiffening braces, bent channels forming bilge members between the sides and bottom of said hull, and outer bilge reinforcing plates riveted to channels on either side of said bent channels.

2. In a barge of the class described, a flanged channel beamed hull, a framing therefor, said framing being notched, riveted to the webs and welded to the flanges, of said hull forming channels, bulkhead forming plates riveted to said framing, and bent channels forming bilge members between the sides and bottom of said hull and outer bilge reinforcing plates riveted to channels on either side of said bent channels.

3. In a barge of the class described, a flanged channel beamed hull, a framing therefor, said framing being notched, riveted to the webs and welded to the flanges, of said hull forming channels, bulkhead forming plates riveted to said framing, bent channels forming bilge members between the sides and bottom of said hull, framing for said bent channels, said framing being notched, riveted to said bulkhead plates and welded to the flanges of said bent channels.

4. In a barge of the class described, a flanged channel beamed hull, a framing therefor, said framing being notched, riveted to the webs and welded to the flanges, of said hull forming channels, bulkhead forming

plates riveted to said framing, bent channels forming bilge members between the sides and bottom of said hull, framing for said bent channels, said framing being notched, riveted to said bulkhead plates and welded to the flanges of said bent channels, and an outer bilge reinforcing plate riveted to said hull forming channels as and for the purpose described.

5. In a bulkhead framing for barges of the class described the combination with a longitudinally flanged channel beamed hull of a plurality of transverse angle plate frames therefor said frames having a short and a longer leg, each of said frames being positioned with its short legs riveted to and in contact with the webs of the hull channels and with the other longer leg in a substantially vertical plane transversely to said channels, said frames being provided with a plurality of spaced notches, to receive therein the flanges of said channels, and said frames being welded to said channels at said notches; two-part bulkhead forming partitions, riveted to the said longer leg of each of said angle frames; and transversely arranged vertical stiffening angle braces secured to said partitions and extending from the top to the bottom thereof across the joint between the parts.

6. In a bulkhead framing for barges of the class described the elements of claim 5, combined with channels, forming bilge members, located between the sides and bottom of said hull, outer bilge reinforcing plates, riveted to channels on each side of each of said bilge channels, with an angle frame piece, bent to fit into each of said bilge channels with one of its legs in contact with the curved web of the bilge channel and with the other leg positioned transversely thereto concentrically therewith and said part being notched and welded to said bilge channel flanges.

7. In a bulkhead framing for barges of the class described, the combination with a longitudinally channel beamed hull, of a plurality of transverse angle frames therefor, each of said angle frames being positioned with one of its legs riveted to the webs of the hull channels and with the other leg in a substantially vertical plane transversely to said channels, said frames being provided with spaced notches extending through one leg thereof and into the other leg, to receive therein the flanges of said channels, said frames being welded to said channels at said notches; and bulkhead forming partitions, riveted to a face of the said other leg of each of said angle frames; and channels, forming bilge members located between the sides and bottom of said hull, outer bilge reinforcing plates riveted to channels on each side of each of said bilge channels, with an angle frame piece bent to fit into each of said bilge channels with one of its legs in contact with the curved web of the bilge channel and with the other leg positioned transversely thereto concentrically therewith and said part being notched and welded to said bilge channel flanges.

8. In a bulkhead framing for barges of the class described, the elements of claim 7, combined with transversely arranged vertical stiffening angle braces, secured to said partitions and extending from top to bottom thereof.

9. In a construction of the class described, the combination of a longitudinally flanged channel beamed hull, of a plurality of transverse angle frames each of said frames having one leg secured to the hull channels and the other leg extending inwardly from said channels; curved channel units forming bilge members located between the sides and bottom of said hull, outer bilge reinforcing plates riveted to channels on each side of each of said bilge channels, with an angle frame piece bent to fit into each of said bilge channels; and bulkhead forming partitions secured to the said other leg of the said transverse angle frames.

10. In a construction of the class described, the elements of claim 9, combined with transversely arranged vertical stiffening angle braces secured to said partitions and extending from top to bottom thereof.

11. In a barge of the class described a longitudinally channel beamed hull, angle frames each having a leg thereof secured to the said hull; curved channels, forming bilge members, located between the sides and bottom of said hull, outer bilge reinforcing plates, riveted to channels on each side of each of said bilge channels, with an angle frame piece bent to fit into each of said bilge channels, and bulkhead forming partitions secured to the other leg of said angle frames.

12. In a barge of the class described, the elements of claim 11, combined with stiffening angle braces secured to the said bulkhead partitions.

13. In a barge of the class described, a flanged channel beamed hull, a framing therefor, said framing being notched, riveted to the webs, and welded to the flanges of the hull forming channels, bulkhead forming two part partitions riveted to said framing, bent channels forming bilge members between the sides and bottom of the hull, with a framing piece bent to fit into each bilge channel member and outer bilge reinforcing plates riveted to the channel beams on opposite sides of each of said bent channels.

14. In a barge construction, a channel beamed hull consisting of side and bottom fabricated structure; bent channel beams forming bilge members placed between the

said side and bottom structure, angle plate frames having short and longer legs arranged at intervals across and within the hull with the short legs attached thereto, an angle frame piece bent to fit within said bilge members and secured thereto, bulkhead partitions secured to the longer of the legs of said angle plate frames and to the bent angle frame pieces within the bilge members, said partitions consisting of overlapping upper and lower plates; and brace bars extending vertically over the joint between these plates and secured thereto, the brace bars extending from top to bottom of said partitions, and outer bilge reinforcing plates, riveted to the channel beams on each side of each of said bilge members.

15. In a barge of the class described a flanged channel beamed hull, a framing therefor, bulkheads riveted to said framing, bent channel beams forming bilge members between the sides and bottom of the hull, with a piece from each frame bent to fit into each bilge channel member, and outer bilge reinforcing plate riveted to the channel beams at opposite sides of each of said bent channel beams.

16. In a barge construction, a flanged channel beamed hull, angle frames secured to the hull, bent channels forming bilge members located between the sides and bottom of the hull, with frame pieces bent to fit into each bilge channel member and being secured thereto, outer bilge reinforcing plates riveted to the channel beams at opposite sides of each of said channel beams; and bulkheads riveted to said frame and to the bent frame pieces for bracing the corners of said bulkheads, and stiffening bars extending vertically over said bulkheads and secured thereto.

Signed at New York in the county of New York and State of New York this 28th day of October, A. D. 1927.

WILLIAM G. ESMOND.