A. McDOUGALL.

SHIP CONSTRUCTION.

APPLICATION FILED DEC. 22, 1916.

1,259,540.

Patented Mar. 19, 1918.

2 SHEETS—SHEET 1.

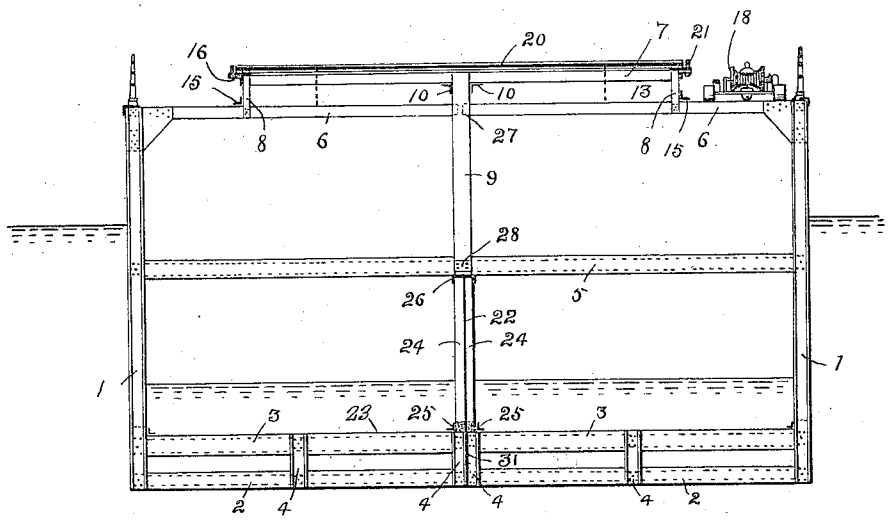


Fig-1.

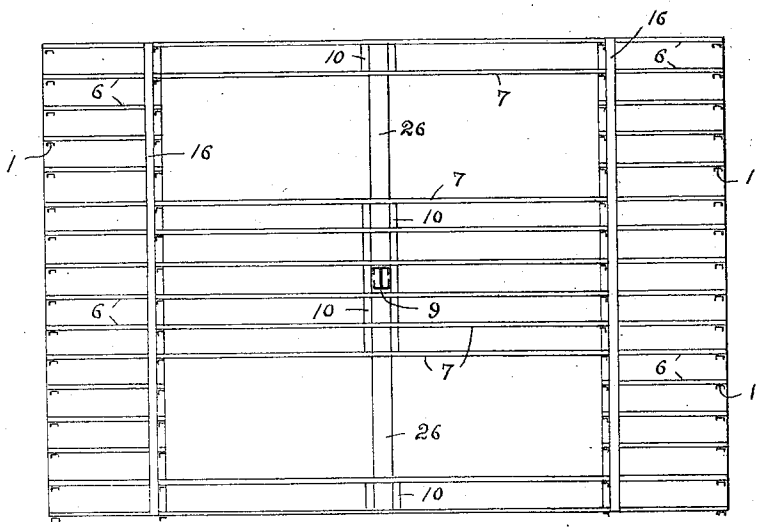


Fig-2

INVENTOR.

Alexander McDougall.

BY

Geo. Stevens

ATTORNEY.

A. McDOUGALL.

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2 SHEETS—SHEET 2.

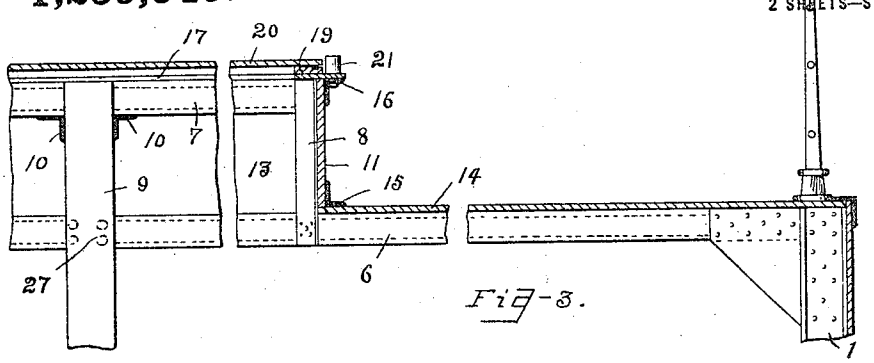


Fig-3.

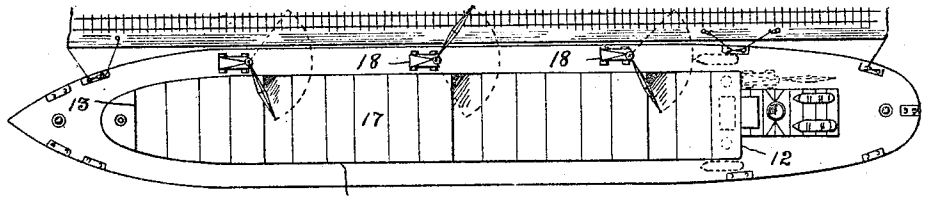


Fig-4.

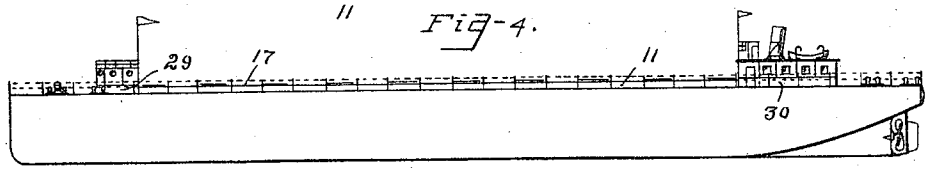


Fig-5.

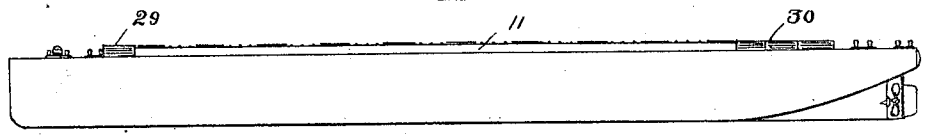


Fig-6.

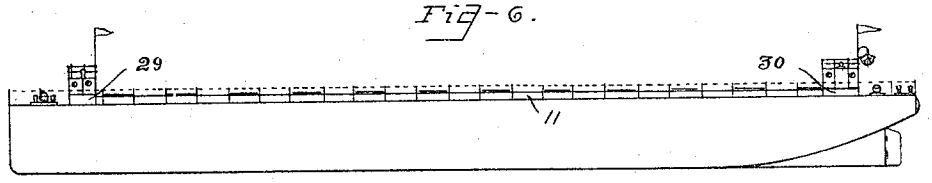


Fig-7.

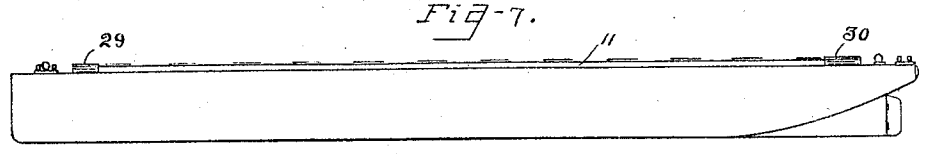


Fig-8.

INVENTOR.

Alexander McDougall.

BY Geo. Stevens.

ATTORNEY.

UNITED STATES PATENT OFFICE.

ALEXANDER McDOUGALL, OF DULUTH, MINNESOTA.

SHIP CONSTRUCTION.

1,259,540. Specification of Letters Patent. Patented Mar. 19, 1918.

Application filed December 22, 1916. Serial No. 138,333.

To all whom it may concern:

Be it known that I, ALEXANDER McDOUGALL, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Ship Construction, of which the following is a specification, reference being had therein to the accompanying drawing.

My present invention consists of certain new and useful improvements in the construction of metal ships and relates particularly to that form known as combination seagoing and canal boats wherein it is desirable at times to have the hull of the vessel as free as possible of superstructure and again at times requiring all the superstructures intact on deck as stanchly as possible to successfully resist the elements and afford suitable means for open sea navigation. The invention further resides in the novel method of manipulating the portable portions of the structure and their convertibility as hereinafter fully described and claimed.

One object of the invention is to produce a ship of this character embodying a form of structure which provides ample safety for the crew when being used in restricted waters such as canals or the like and obliged to pass under low bridges.

Another object is to form such a vessel having the greatest carrying capacity possible in combination with the advantages of high hatch coamings for keeping waves off.

Another object is that of reducing to a minimum the parts of superstructure necessary to house within the hull of the vessel when being converted into a canaler.

Another object is to provide means of protection for the portable hoisting mechanism on the deck of the vessel, and obviate the necessity of removing same to the hold, and which mechanism affords the most advantageous device possible for moving freight between the vessel and adjacent railroad tracks or the like.

Another object is simplicity and strength of structure.

Still other objects and advantages will appear in the further description of the device.

Referring now to the accompanying drawings forming part of this application and in which like reference numerals indicate like parts:

Figure 1 is a midship cross sectional view of my improved form of ship's hull.

Fig. 2 is a plan view of a fragmental portion of the upper deck framing of the hull.

Fig. 3 is an enlarged cross sectional view of a fragmental portion of the upper deck framing illustrating in detail the fore and aft hatch trunk.

Fig. 4 is a plan view of a steam vessel built in accordance with my improved form and method of construction moored adjacent a wharf, for loading or unloading.

Fig. 5 is a side elevation of a steam vessel embodying my invention and fully mantled for open sea navigation.

Fig. 6 is a similar view of the same vessel completely dismantled for canal navigation.

Fig. 7 is a view similar to Fig. 5 of a tow barge, and

Fig. 8 is a similar view to Fig. 6 but of the tow barge illustrated in Fig. 7.

In the construction of my improved form of hull, I prefer to utilize as large a proportion as possible of channel bars and as great a proportion as possible of other material just as its comes from the mills. With this and other objects in view the form of the hull of the vessel is substantially rectangular in cross section throughout the major portion thereof, and all superstructures made principally of right angular form. 1—1 represent the side frames of the hull. The bottom framing is formed of a fabricated truss construction comprising parallel horizontal channel bars 2 and 3 united by any desired number of short vertical channels 4 intermediate their ends and at their extreme outer ends by the side frames 1—1. 5 represents intermediate beams which may be used as deck beams or not, as preferred, and 6 represents the uppermost deck beams of the hull. Upon the upper deck beams 6 is built a raised hatch trunk extending the full length of the cargo hold of the vessel in which the hatches occur and to a predetermined distance beyond same at both ends thereof. This trunk comprises channel deck beams 7, supported at their ends upon suitable up-

right channels or angles 8—8 properly secured to the deck beam 6 and in the center of the vessel upon the stanchions 9, being fastened thereto by suitable fore and aft angles 10 and which stanchions occur intermediate of two adjacent channel beams. The stanchions 9 may be of fabricated construction or of suitable single bars as preferred. Fore and aft plates 11 are fixed to the outermost edges of the angles 8 forming the side walls of the trunk and similar plates indicated at 12 and 13, Fig. 4, form the ends of the trunk. 14 constitutes the main deck of the hull, is straight from stem to stern of the hull and is substantially flat. Suitable connection between the main deck 14 and the side walls 11 is afforded by fore and aft angles 15. Similar angles 16 are securely riveted to the upper edge of the side wall forming a projecting ledge or flange along the upper edge of the trunk and to which is securely fastened the deck plates 17 which permanently cover the trunk intermediate the hatches and the upper edge of the side walls 11 and the ends of the angles 8 at the hatches. As a convenient arrangement and a most practical embodiment of my invention, I illustrate this elevated trunk as being approximately two-thirds of the entire width of the vessel and from two to three feet in height, as desired. This proportion will give ample room for manipulation of the portable hoists indicated at 18 mounted upon low flat wheels and which, as is evident, may be moved about to any desired location on the main deck 14, and completely around the trunk upon the deck. It also gives ample room for persons on deck to crouch down along side of or behind the trunk and out of danger when the vessel is passing under bridges or other structures spanning the waterway being navigated. I have illustrated a low flat hatch coaming at 19 upon which the hatch plates 20 rest, this form of hatch coaming and cover being known to the art and previously patented by me.

As a guide to the hatch covers, during their manipulation, I provide a plurality of upstanding stub bolts or rivets 21 securely fastened to the projecting flanges of the side walls of the trunk.

This trunk not only acts as an element of safety for the deck of the vessel, but greatly increases the longitudinal strength thereof, as well as materially increasing the carrying capacity of the hull.

Within the hull of the vessel and longitudinally the center thereof, is a continuous bulkhead 22, it extending vertically from the inner bottom 23 which rests upon the channel floor beams 3 to the under side of the intermediate beams 5, the latter also preferably being channel bars. Upon either side of and rigidly secured to the bulkhead 22 are a plurality of upright channel bars 24, they being preferably in pairs, one upon each side of the bulkhead and opposite each other. Angles 25—25 are placed longitudinally in the corner formed between the channels 24 and the floor 23 to form a secure bond therebetween. The upper end of the channels 24 are flush with the upper edge of the bulkhead 22 and a channel 26 is inverted longitudinally thereupon, forming a smooth cap or cover for the upper edge of the bulkhead and the channels 24. This smooth covering is essential in the successful manipulation of cargo to and from the lower hold during raising and lowering of same, or the handling of the various kinds of buckets or grappling devices known in the art and is also essential for a secure and convenient attachment to the intermediate thwartship beams 5 for supporting same, and which are riveted thereto. Beneath each section of the elevated deck 17 on the trunk between the hatches and adequately supporting same, are a suitable number of stanchions 9, they having the two fore and aft angles 10—10 uniting them, with the channels 7 as before explained and also united in any desired manner, or by direct engagement, with the deck beams 6 as at 27. There may be any desired number of these stanchions, but one for each section of the elevated deck 17 is considered sufficient there being but one deck beam 6 at each section which extends entirely across the hull of the ship and thus directly connects the opposite side frames 1—1, however two or more beams may be thus extended if so desired and as before stated the number of stanchions increased. A clear space is desirable within the trunk to provide ample room for manipulation of the cargo and to offer as little obstruction as possible, the angles 10—10 providing ample support for the fore and aft edges of the deck 17. The lower end of the stanchions 9 rest upon the back of the channel 26 and are fastened thereto by suitable angle clips 28, preferably one upon each side thereof.

At the extreme forward and after ends of the hatch trunk, a somewhat similar trunk construction is continued as at 29 and 30. These extensions are preferably reduced somewhat in width to that of the trunk proper and are not decked over other than what might be desirable in their office of forming a portion of the superstructures or deck houses at either end of the vessel, as they are designed to form a portion thereof. It is however obvious that they being a continuation of the hatch trunk add to the strength of the vessel. In the case of both steamer and barge, the deck houses are made of sectional or knock-down construction which is known to the art and heretofore patented by me. The exact form

of such construction not being considered essential to this invention other than the fact that they become a coöperative part of the extensions 29 and 30 and are erected directly thereupon when the ship is fully mantled. When knocked down practically all of the sectional portions of the houses may be stowed away in and along side of the extensions 29 and 30 and such larger portions of the sea-going equipment, as for instance the smoke stack, pilot house, and life boats, may be stowed away in the hull of the vessel and for which purpose the portable hoists 18 are brought into use. These hoists may also be stowed away in back of the after corners of the main trunk and adjacent the extension 30 while passing under bridges or may there be securely lashed while at sea. The hoists are mounted upon smooth flat wheels which may be slid or rolled by hand to any desired position on deck.

A bulkhead 31 constructed in any desired manner and in direct vertical line with the bulkhead 22 is placed intermediate the bottom of the hull and the floor 23 and other similar fore and aft bulkheads between the center and the side walls of the hull may be employed as desired. The floor 23 is in practice frequently referred to as the tank top.

From the foregoing it is evident that when being navigated upon restricted waters and obliged to pass under bridges, the mooring and manipulating elements, such as bollards, capstans and the like, remain at all times intact as they do not extend above the hatch trunk and will thus greatly facilitate the handling of the vessel. In the case of the tow barge, the deck houses or superstructures would be considerably smaller than those of the steamer and it is quite possible might be lifted in their entirety from the extensions 29 and 30 of the hatch trunk and stowed in the hold.

The object of the bulkhead 22 extending but a portion of the depth of the hull other than for the purpose of strength, is to prevent injurious wash of ballast water when used within the hold, as while I have shown the vessel provided with water compartments between the bottom of the vessel and the deck 23, that is, space sufficiently large for ordinary water ballast purposes, yet it may frequently happen in canals or the like that this space is insufficient for the proper submersion of the vessel and that water in the hold would have to be resorted to.

Again it is quite possible that the water ballast compartments may be employed for fuel oil storage at a time when it is desired to lower the vessel in the water and at which time, water in the hold would be resorted to, when the necessity of having a fore and aft bulkhead therein becomes obvious.

Having thus described my invention what I claim and desire to secure by Letters Patent, is:

1. The combination with a ship's hull substantially rectangular in cross section, having an inner bottom or tank top therein and thwartship beams intermediate the tank top and the uppermost deck beams, of a fore and aft bulkhead extending from the tank top to the underside of the thwartship beams, stanchions intermediate the thwartship beams, resting upon the bulkhead and extending upwardly above the uppermost deck beams, and a continuous elevated hatch trunk extending the full length of the cargo hold of the ship, supported at its sides upon the uppermost deck beams and at its center upon the stanchions.

2. In a ship's hull of substantially rectangular shape in cross section, having a double bottom and intermediate thwartship beams therein, a central bulkhead extending from the inner bottom to the under side of the beams and securely attached thereto, stanchions resting upon and attached to the bulkhead intermediate the beams, and supporting the uppermost deck of the hull and a continuous elevated hatch trunk extending longitudinally the entire length of the cargo hold of the hull.

3. The combination with a ship's hull having a continuous elevated hatch trunk thereupon and a double bottom therein, of a central support comprising, in combination, a water tight bulkhead resting upon the inner bottom and stanchions resting upon the bulkhead and supporting the center of the hatch trunk.

4. The combination with a ship's hull substantially rectangular in cross section, having a continuous elevated hatch trunk thereupon and a double bottom therein, of a central support comprising a bulkhead and supporting stanchions and which support extends from the inner bottom up to and supports the central portion of the hatch trunk.

5. The combination with a ship's hull substantially rectangular in cross section, having a continuous elevated hatch trunk thereupon, a double bottom and intermediate thwartship beams therein, of a continuous central bulkhead resting upon the inner bottom, channel iron stanchions upon each side of the bulkhead and supporting same, an inverted channel upon the upper edge of the bulkhead, covering the ends of the channels and attached thereto, the intermediate thwartship beams resting upon the inverted channel, and stanchions resting upon the inverted channel and securely attached thereto intermediate the thwartship beams and supporting upon their uppermost ends the center of the hatch trunk.

6. In a ship's hull substantially rectangular shape in cross section, a double bottom

within the hull, a fore and aft central bulkhead resting upon the inner bottom and supported by channel bars upon either side thereof, intermediate thwartship beams resting upon the bulkhead and dividing the hold of the vessel into substantially two equal parts vertically, stanchions resting upon and securely fastened to the upper edge of the bulkhead intermediate the thwartship beams, thwartship beams supporting the trunk deck, passing intermediate the stanchions and supported thereupon by fore and aft angles fastened to the stanchions and the beams, and a continuous fore and aft hatch trunk supported upon the deck beams at the sides thereof by short upright stanchions and side plates and in the center by the bulkhead stanchion, substantially as shown and described.

7. A rectangular shaped ship hull framing composed substantially wholly of channel iron bars, comprising a double set of bars united in such a manner as to form a strong deep fabricated floor frame, channel bars fastened to the ends of the floor frame and extending upwardly forming the side frames of the hull, upper deck frames fastened to the upper ends of the side frames only a portion of the deck frames extending entirely across the hull, a hatch trunk frame extending upwardly from the ends of the short deck frames, and spanned intermediate the hatches by deck frames, intermediate long deck frames between the side frames and dividing the hold of the hull into substantially two equal parts vertically, a central fabricated bulkhead extending from the floor frames to the intermediate deck frames and supporting same, and stanchions extending from the upper edge of the bulkhead to the deck frames of the trunk and supporting same.

8. In a ship's hull of substantially rectangular shape in cross section, having a double bottom and intermediate thwartship beams therein, a central bulkhead extending from the inner bottom to the under side of the beams and securely attached thereto and stanchions resting upon and attached to the bulkhead intermediate the beams and supporting the uppermost deck of the hull.

9. The combination with a ship's hull having upper deck beams and a double bottom therein, of a central longitudinal support comprising in combination, a watertight bulkhead resting upon the inner bottom and stanchions resting upon the bulk head and supporting the upper deck beams.

10. In a ship's hull having upper thwartship deck beams, intermediate thwartship deck beams and a double bottom therein, a central bulkhead extending from the inner bottom to the under side of the intermediate deck beams and securely attached thereto and stanchions resting upon and attached to the bulkhead and supporting the upper deck beams of the hull.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ALEXANDER McDOUGALL.

Witnesses:
S. GEO. STEVENS,
A. C. DUNN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."