G. E. KASTENGREN.

MARINE VESSEL CONSTRUCTION.

APPLICATION FILED FEB. 26, 1918.

1,301,270.

Patented Apr. 22, 1919.

2 SHEETS—SHEET 1.

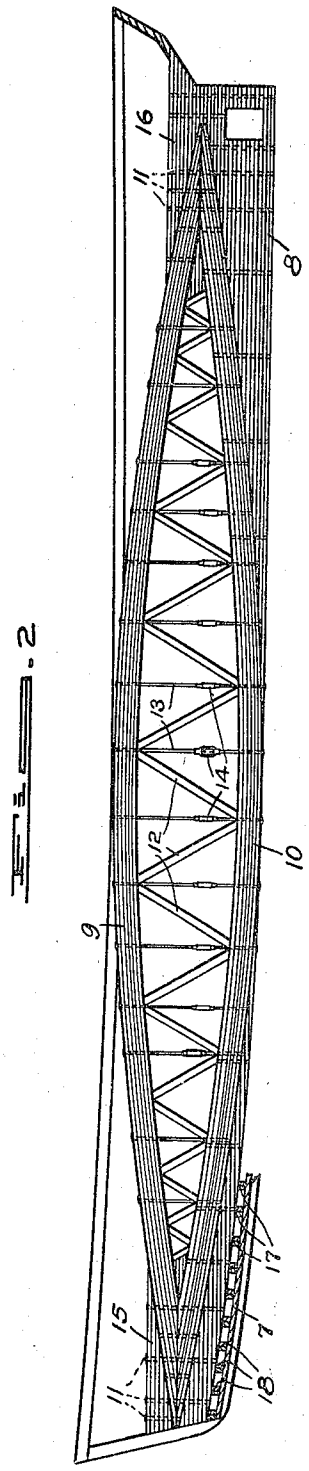


FIG. 2

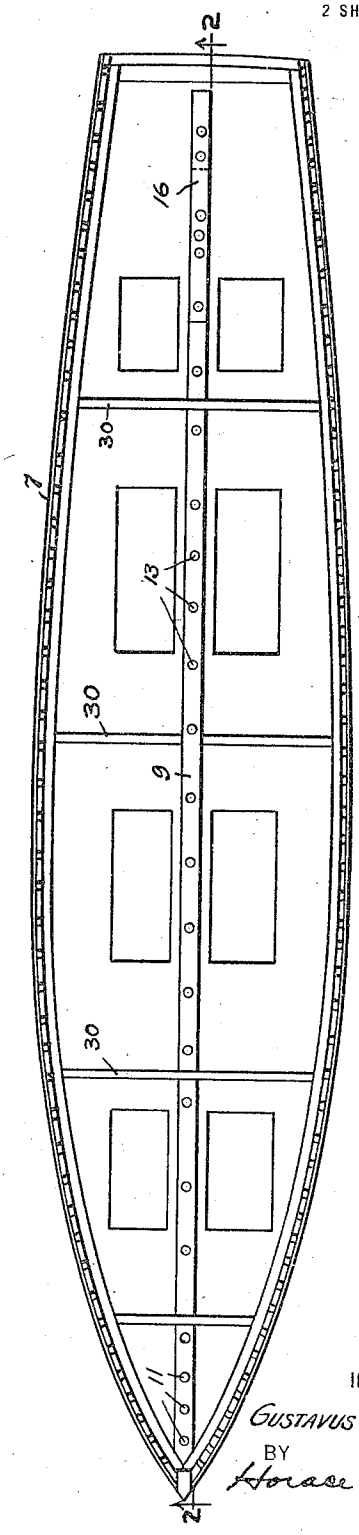


FIG. 1

INVENTOR

GUSTAVUS E. KASTENGREN

BY

Horace Barnes

ATTORNEY

G. E. KASTENGREN.

MARINE VESSEL CONSTRUCTION.

APPLICATION FILED FEB. 26, 1918.

1,301,270.

Patented Apr. 22, 1919.

2 SHEETS—SHEET 2.

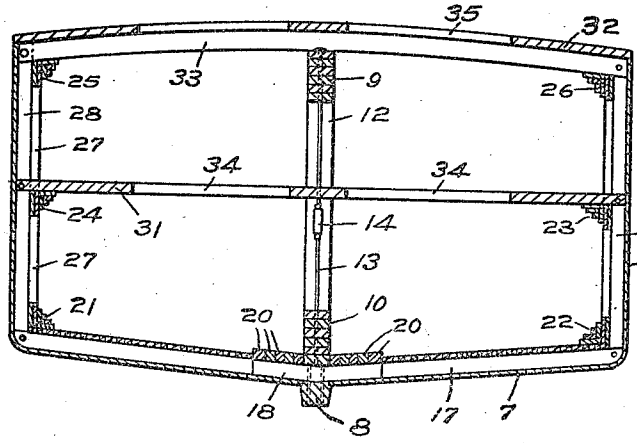


Fig. 3

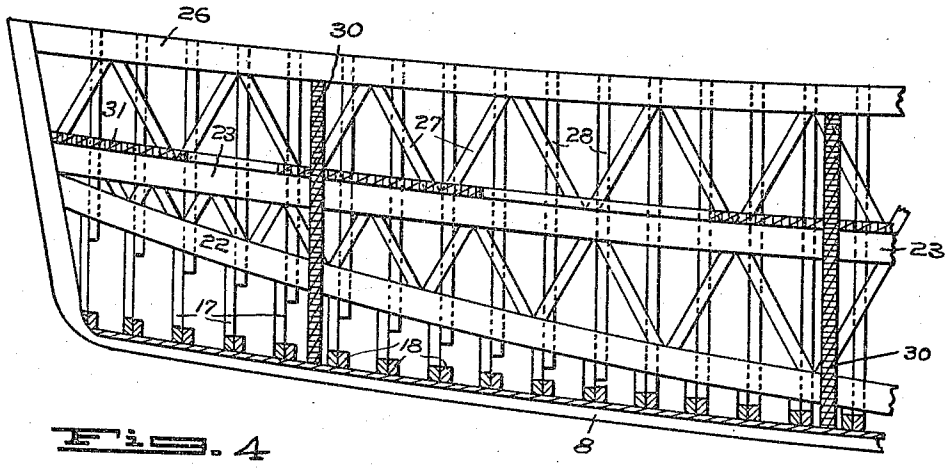


Fig. 4

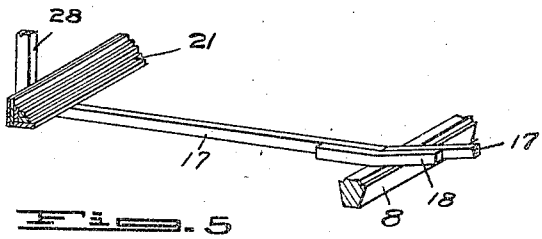
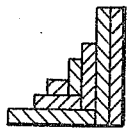


Fig. 5

Fig. 6



INVENTOR

GUSTAVUS E. KASTENGREN

BY

Horace Barnes

ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GUSTAVUS E. KASTENGREN, OF SEATTLE, WASHINGTON.

MARINE-VESSEL CONSTRUCTION.

1,301,270. Specification of Letters Patent. Patented Apr. 22, 1919.

Application filed February 26, 1918. Serial No. 219,296.

To all whom it may concern:

Be it known that I, GUSTAVUS E. KASTENGREN, a citizen of the United States, and resident of Seattle, in the county of King and State of Washington, have invented a new and useful Improvement in Marine-Vessel Construction, of which the following is a specification.

This invention relates to improvements in ship construction, and has for its object the provision of a vessel of relatively simple and economical construction in which the hull is reinforced by longitudinal truss members in both vertical and horizontal planes so that amply sufficient strength throughout its length is imparted to the vessel without material sacrifice of cargo capacity.

The invention consists in the novel construction of a marine vessel, and more specifically in the novel construction, adaptation and combination of strengthening and truss members in the frame-work of the vessel, including solid bow and stern sections, all of which may be built up of a plurality of relatively small plank in laminated form, and said members being rigidly connected at bow and stern with said solid portions.

The invention further consists in the novel construction, adaptation and combination of other parts and devices, as will be fully described in the following specification, illustrated in the accompanying drawings, and finally set forth in the appended claims.

In the drawings Figure 1 is a plan view of a motor vessel constructed in accordance with this invention, the top deck thereof being removed. Fig. 2 is a view in sectional elevation substantially on broken line 2, 2 of Fig. 1, certain parts being broken away. Fig. 3 is an enlarged view in cross section on broken line 3, 3 of Fig. 2. Fig. 4 is an enlarged view in sectional elevation substantially on a medial line of the front end of the vessel, the large central truss being omitted to better illustrate the side trusses. Fig. 5 is a fragmentary view in sectional perspective illustrating certain details of the invention and Fig. 6 is a view in cross section illustrating a detail of the invention.

Referring to the drawings throughout which like reference numerals indicate like parts, the numeral 7 designates the outer planking that forms the bottom and sides of the vessel, and 8 the keel extending lengthwise along the center of the bottom of the vessel in the well known manner common to marine vessels.

9 and 10 designate two oppositely arched truss members secured together at their outer ends as by bolts 11 and bowed apart in their central portions. Said truss members are arranged in a vertical plane in the longitudinal axis of the vessel and provide a due amount of rigidity lengthwise of the ship in its movements in vertical directions.

The double arch thus formed is provided throughout with spaced compression struts 12 and tension members in the form of truss rods 13 provided with turnbuckles 14 by which such rods may be made to exert the desired amount of tension.

Truss numbers 9 and 10 are composed of timber of relatively small thickness arranged in laminated form whereby clear timber of relatively small cost may be utilized and a rigid curved beam may be built up without steaming or undue difficulty.

The keel portions at the bow and stern of the vessel adjacent the opposite ends of the central truss structure are built up in similar laminated construction as shown at 15 and 16, respectively, in the longitudinal vertical axis of the vessel.

The ends of the truss members 9 and 10 are built into the laminated upright end sections of the keelson and are rigidly secured thereto by allowing some of the bolts 11 to extend through both of the truss members and through the laminated sections of the keelson.

The frame-work for the bottom of the vessel consists of transverse timbers 17 resting upon the keel 8, and extending outwardly therefrom in both directions as shown in Fig. 3. The inner ends of timber 17 are secured to each other and to the keel by reinforcing knees 18 which are disposed alongside of the abutting ends of the timber 17, and are securely bolted thereto and to the keel.

20 indicates relatively heavy timbers that extend lengthwise of the vessel parallel with the keel resting upon the timbers 17, and are securely bolted to the knees 18. One

effect afforded by the provision of the timbers 20 is to reduce the pressure upon the timber 17 by shortening the effective span thereof, and enabling them to resist a greater upward pressure of the water.

The frame-work for the sides of the vessel comprises a plurality of longitudinally extending lateral members 21, 22, 23, 24, 25 and 26 molded to the form of the vessel's beam, and are built up of a plurality of laminated planks rigidly spiked and bolted together. Said lateral members are arranged in pairs in horizontal planes disposed symmetrically upon either side of the longitudinal axis of the vessel, and are rigidly secured to the stem and stern of the vessel so that in effect a rigid connection is formed between the ends of the medial truss member and the ends of the side beams, the medial truss acting as a strut between the lateral beams on the sides. Transverse vertical bulkheads 30 are utilized as struts separating the said lateral truss members, and maintaining the lateral truss members and the vertical truss members 9 and 10 in their prearranged planes, and in spaced relation with respect to each other.

The central truss structure comprised of members 9 and 10 positioned in the medial chord of said lateral trusses binds the extremities of the lateral trusses. Thus the vertical truss construction and the lateral truss members unite together to form a homogenous frame structure, mutually combining the whole vessel construction together and affording a sufficiently rigid support for the hull of the vessel without undue excess of weight.

The lateral members 21 to 26, inclusive, are built-up construction of planks as illustrated in Fig. 6, being practically triangular in cross-section, and form continuous knees throughout the length of the vessel to give the required strength and rigidity to the framework. It will be understood that any desired number of pairs of the lateral members 21, 22, 23, 24, 25 and 26, either more or less than the number shown in the drawings, may be used, but it is preferable to use three of such pairs, and to locate one at the lower portion of the side or bilge of the vessel, one adjacent the upper extremity of the side, and one about midway therebetween, as shown in Figs. 2 and 3.

27 are diagonal struts or compression members that are interposed between the lateral members 21 to 26, inclusive, upon each side in likeness to the struts of a bridge truss, as more clearly shown in Fig. 4, to strengthen the sides of the vessel.

28 indicate vertical side frames secured to the outer ends of the bottom timbers 17, and extend outwardly on the outside of the lateral members 21 to 26. The frames 28 form supports to which the planking on the sides of the vessel may be secured. The transverse bulkheads 30 are preferably built up of laminated timbers securely spiked and bolted together.

The vessel is also preferably provided with a between-deck 31 formed of transverse timbers laid side by side and bolted or spiked together, and to the vertical frames 28, the ends of the timbers forming the deck resting upon and being secured to the lateral members 23 and 24. The deck 31 serves to resist compression upon the sides of the vessel due to external pressure. The main-deck 32 is supported on cross-beams 33 that rest at their ends upon lateral members 25 and 26 and secured to the top ends of the side frames 28.

Decks 31 and 32 are provided with hatchways 34 and 35, positioned for suitable access to the holds of the vessel in the cargo spaces between the bulkheads 30.

It is obvious that changes in form of construction of the various parts of the vessel may be made within the scope of the claims, but it is particularly pointed out that the vessel made in accordance with the spirit of my invention will embody the maximum of strength and resistance to pressure and distortion due to the carrying of heavy cargoes and the buffeting encountered in ocean voyages, together with the avoidance of integral timbers of large size. The provision of the central lateral vertical truss member with the complementary horizontal trusses affords a unique plan of construction, combining economy and strength in an exceptionally high degree.

Having described my invention, what I claim and desire to secure by Letters Patent of the United States, is:

1. A marine vessel having a keelson provided with laminated vertical extensions at the stem and stern and a truss structure extending from end to end of the vessel and consisting of continuous beams of laminated construction that merge with and are secured to the laminated vertical extensions of the keelson.

2. The combination with the hull of the vessel, of a truss extending lengthwise in the medial plane and throughout the entire length of said hull, said truss being formed of an upwardly bowed member and a downwardly bowed member that have their ends secured together, the bow and stern ends of the keelson being solidly built up of a plurality of relatively small timbers bolted together, and the ends of said bowed truss members being secured to and forming a part of said built up end sections.

3. A marine vessel including a vertical truss structure extending from end to end along the longitudinal axis of the vessel, lateral beams arranged in pairs in horizontal planes upon opposite sides of the vertical

truss and forming the side framing of the vessel, vertical extensions of laminated timber secured to the stern and stem ends of the keelson, said vertical truss structure being of laminated timber construction united and incorporated at its ends with said vertical extensions of the keelson, and said side beams being of laminated construction built in the form of knees and secured at their ends to said laminated vertical extensions to said keelson.

Signed at Seattle, Washington, this 15th day of February, 1918.

GUSTAVUS E. KASTENGREN.

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