H. E. SMITH.

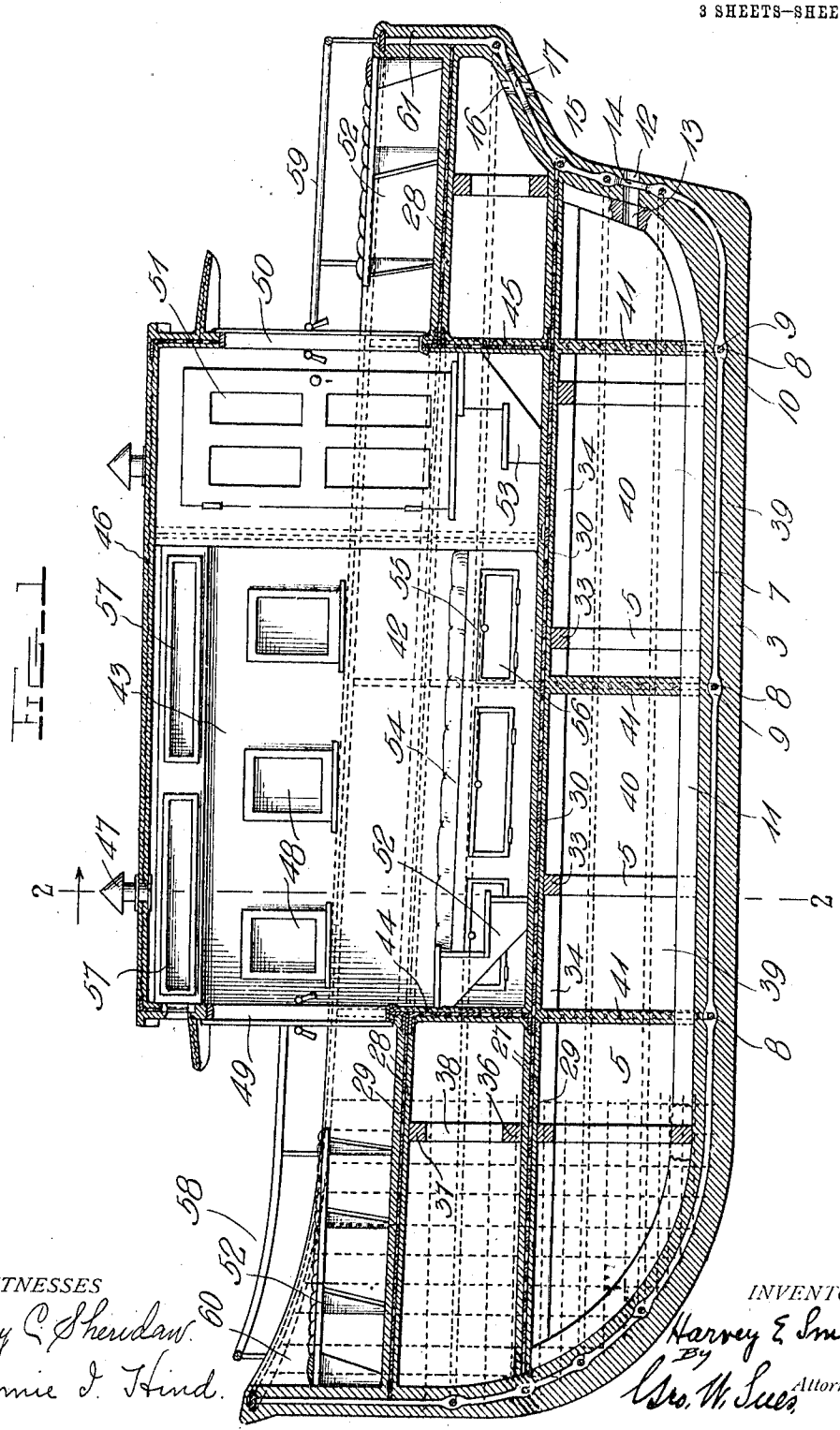
BOAT CONSTRUCTION.

APPLICATION FILED OCT. 12, 1911.

1,090,349.

Patented Mar. 17, 1914.

3 SHEETS—SHEET 1.



WITNESSES

Mary C. Sheridan.

Annie I. Hind.

INVENTOR

Harvey E. Smith

By

Geo. W. Sues, Attorney

H. E. SMITH.

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3 SHEETS—SHEET 2.

FIG. 2

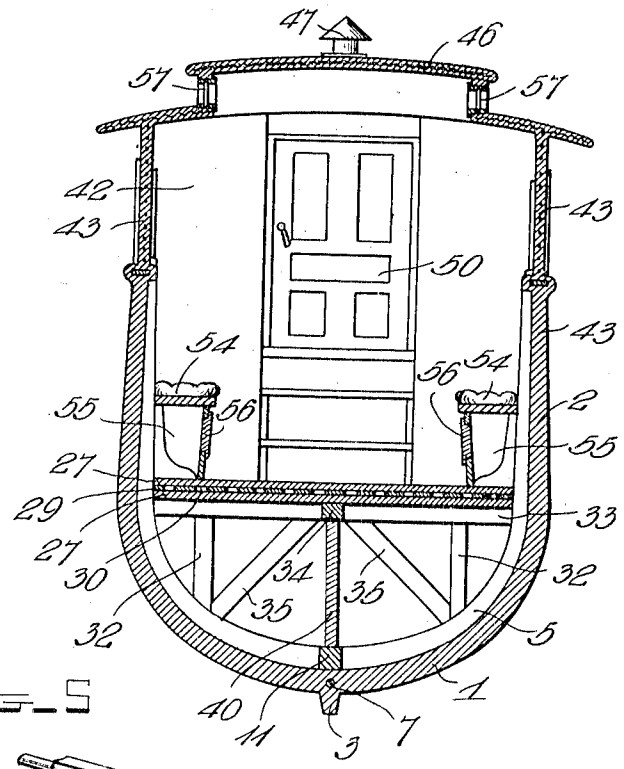
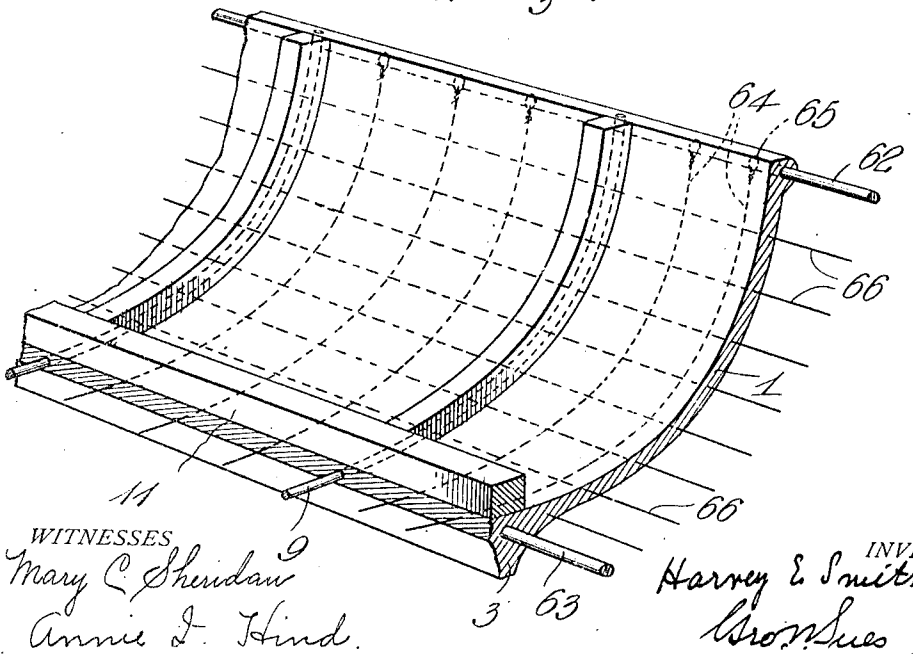


FIG. 5



WITNESSES

Mary C. Sheridan

Annie L. Kind.

INVENTOR

Harvey E. Smith

Geo. Shea Attorney

H. E. SMITH.

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3 SHEETS—SHEET 3.

FIG. 3

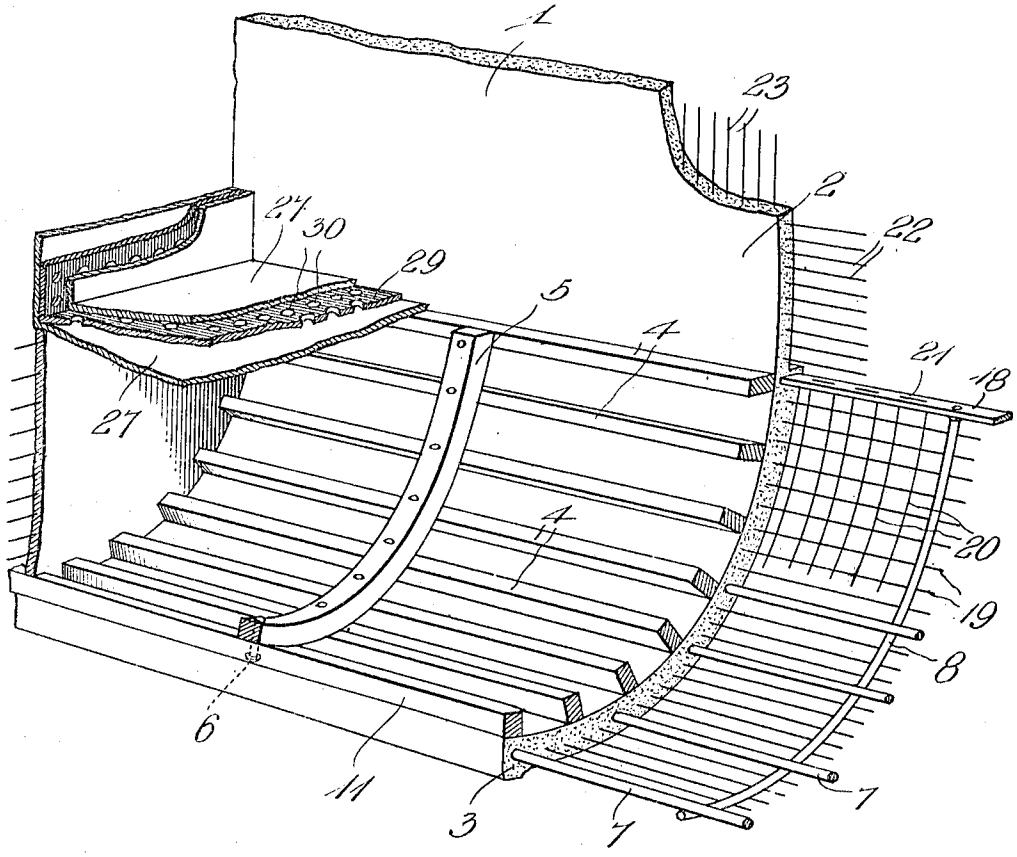
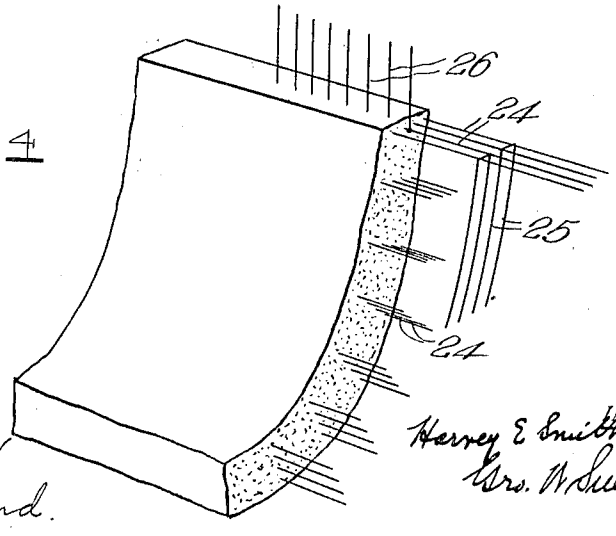


FIG. 4



WITNESSES

Mary C. Sheridan

Annie J. Hind.

INVENTOR

Harvey E. Smith

Bros. & Sues.

Attorney

UNITED STATES PATENT OFFICE.

HARVEY ELVIN SMITH, OF REPRESA, CALIFORNIA, ASSIGNOR OF ONE-HALF TO ROBERT C. JOHNSON, OF REPRESA, CALIFORNIA.

BOAT CONSTRUCTION.

1,090,349. Specification of Letters Patent. Patented Mar. 17, 1914.

Application filed October 12, 1911. Serial No. 654,419.

To all whom it may concern:

Be it known that I, HARVEY E. SMITH, a citizen of the United States, and a resident of Represa, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Boat Construction, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to boat construction.

The invention aims, generally speaking, to provide a boat's hull so constructed that it will require no calking, will have no seams, will be more substantial than the ordinary wooden or steel hull, and will not corrode or collect barnacles.

The invention further aims to disclose a novel means for reinforcing such a hull so that it will effectually withstand shocks and vibration.

The invention also contemplates embodying the features of construction of the hull in the construction of the decks, and the walls of the cabin and other compartments of the boat, depending upon the character of the boat. At this point it may be remarked that the principles of the invention may be embodied in the construction of a boat of any type; that is to say, in the construction of steam, gasolene, or other motor driven passenger boats, freight boats, ships, launches, sail boats, row boats, fishing smacks, canal boats, etc.

The invention aims still further to provide in the hull water tight compartments, the walls of which are of practically the same construction as the hull, the purpose of such compartments being to prevent sinking of the boat should the hull become fractured at any one point. In the event of such an accident, but one of the said compartments would become filled with water.

With these and other objects in view the present invention consists in the combination and arrangement of parts as will be hereinafter more fully described and finally pointed out in the appended claim, it being further understood that changes in the specific structure shown and described may be made within the scope of the claim, without departing from the spirit of the invention.

In the accompanying drawings forming a part of this specification and in which like numerals of reference indicate similar parts in the several views: Figure 1, is a vertical longitudinal sectional view through a boat constructed in accordance with the present invention, the same being in the form of a gasolene launch. Fig. 2, is a vertical transverse sectional view on the line 2, 2, of Fig. 1, looking in the direction indicated by the arrow. Fig. 3, is a fragmentary sectional perspective view illustrating a portion of the hull of the boat. Fig. 4, is a similar view illustrating a slightly modified arrangement of the reinforcing means for the hull. Fig. 5, is a view similar to Fig. 3, showing a modified form of reinforcement for the hull.

In the drawings, the bottom of the hull of the launch is indicated by the numeral 1, and the side walls thereof by the numeral 2. The body of the hull is of concrete or some other plastic material molded to the proper form and dimensions. The bottom of the hull is molded to form the keel 3, of the boat, and the exterior surface of the hull is preferably of the same form as would be the ordinary hull for that type of boat. The interior of the hull, however, is smooth as shown in Figs. 1, 2 and 3. Beams 4, of wood or metal are arranged against the inner side of the hull and extend longitudinally thereof, these beams being spaced apart as usual, and extending in a series from the deck line on one side of the hull to the deck line on the other side of the hull. These beams are connected in their spaced relation by means of struts 5, secured thereto by bolts 6, as shown in Fig. 3.

In the form of the invention shown in Figs. 1, 2 and 3, lengthwise running reinforcing rods 7, are embedded in the bottom and walls of the hull and brace rods 8, are also embedded in the hull and transect the rods 7, in the manner shown in Figs. 1 and 3, of the drawings. By referring to these figures, it will be noted that the rods 7, extend longitudinally of the hull and that the brace or strut rods 8, extend transversely of the hull, and the said strut rods may extend through eyes 9, formed in enlarged portions 10, of the rods 7, as shown in Fig. 1, of the drawings, or may extend beneath and support the rods 7, as shown in Fig. 3. The center beam of the boat is indicated by the numeral 11, and as usual extends from stem to stern. In order to accommodate the pro-

peller shaft (not shown), the hull is formed at its stern with an opening 12, and this end of the center beam is formed with an opening 13, in alinement with the opening 12. The middle one of the reinforcing rods 7, is split at this point to form a collar 14, through which and the openings 12 and 13, the boxing for the propeller shaft may be fitted. At the stern, the hull is provided with an opening 15, which is in registration with an opening 16, in an enlarged portion 17, of the said central one of the rods 7, and through these openings is to be fitted the stem of the rudder for the boat (not shown).

Embedded in each side wall of the hull of the boat and extending longitudinally thereof, is an apertured bar 18, shown in Fig. 3, in which the ends of the U-shaped strut rods 8, are secured. Reinforcing wires or rods 19, are also embedded in the walls of the hull and extend lengthwise of the hull, and reinforcing strut wires or rods 20, are also embedded in the walls of the hull and extend transversely thereof and intersect the wires or rods 19, in the manner shown in Fig. 3, of the drawings. In the form of the invention shown in Fig. 3, of the drawings, the wires or rods 20, are threaded through the bars 18, as indicated at 21. In the form of the invention shown in the drawings, the bars 18, are located at the deck line of the boat, and, as shown in Fig. 3, above this line there are provided reinforcing wires 22 and 23, which correspond to the wires 19 and 20, respectively. As shown the strut wires 20 are intertwined between the wires 19.

While the reinforcing devices shown in Figs. 1, 2 and 3, are sufficient for small boats, in constructing larger boats embodying the principles of the present invention, it may be expedient to employ a reinforcing means such as shown in Fig. 4, of the drawings. As shown in this figure of the drawings, the bottom and side walls of the hull are reinforced by means of wires or rods 24, which are embedded therein and are arranged in series of two, three or any desired number depending principally upon the thickness of the wall of the hull and the size of the boat. Strut wires or rods 25, are arranged transversely of the hull within the wall thereof, in this form of the invention, and are each looped about one or more of the wires 24, at the deck line of the side walls of the hull in the manner shown in Fig. 4, of the drawings. Between their portions which are looped over the wires 24, the said strut wires 25, are interwoven with the wires 24, the strands of the wires 25, being preferably of the same number as the strands of each set or series of the wires 25. As before stated, the sets of wires 24, are arranged in a series from deck line to deck line, and secured at their lower ends to the uppermost wires 24, are wires or rods 26, which are embedded in the walls of the boat's cabin, in the manner shown in the said Fig. 4, these wires serving the same function as the wires 23.

In Fig. 1, of the drawings, the lower deck is indicated by the numeral 27, and the upper deck by the numeral 28, and as indicated specifically in Figs. 2 and 3 of the drawings, each of these decks consists of a slab or layer 27, of cement, a similar slab or layer 28, and a reinforcing sheet 29, of metal, formed with openings 30. It will be observed that the reinforcing sheet 29, is located between the layers 27 and 28, and it will be understood that when the decks are molded in the course of construction of the boat, the cement or other plastic material of these layers will flow into the openings 30, in the reinforcing sheet, thereby bonding the layers and firmly securing the reinforcing sheet in place. As shown in the said Fig. 1, of the drawings, these decks 27 and 28, are preferably molded integral with the walls of the hull of the boat.

In supporting the lower deck of the boat, vertical braces 32, are disposed at their lower ends upon and secured to the struts 5, as shown in Fig. 2, and at their upper ends support cross beams 33, extending transversely beneath the said deck. A beam 34, extends longitudinally beneath the said lower deck from stem to stern above the center beam 11, and diagonal braces 35 are secured at their upper ends to this beam 34, and at their lower ends to the struts 5, and the lower ends of the braces 32. In supporting the upper deck, cross beams 36, are arranged upon the upper surface of the lower deck and beams 37 against the under surface of the upper deck, in the manner shown in Fig. 1, of the drawings, and vertical braces 38, are secured in position between these beams.

The water-tight compartments before referred to are indicated by the numeral 39, and are located below the lower deck and between the same and the bottom of the hull of the boat, as shown in Figs. 1 and 2, of the drawings. These compartments are formed by providing beneath the said lower deck a partition wall 40, which extends from stem to stern of the boat, and transverse partition walls 41, which extend across the hull beneath the said lower deck. These walls are of course arranged in intersecting vertical planes. As before stated, should the hull of the boat be fractured, it is probable that but one of the compartments would become filled with water and this would be insufficient to sink the boat.

In the type of boat shown in Fig. 1, of the drawings, the lower deck forms the floor of the cabin, which latter is indicated in general by the numeral 42. The side walls of this cabin are indicated by the numeral

43, and in this instance form continuations of the side walls of the hull, and the stem and stern walls are indicated respectively by the numerals 44 and 45. It will be noted from an inspection of Fig. 1, that the stem and stern walls of the cabin are in a vertical plane with the foremost and rearmost partition walls 41, and that these walls as well as the side walls of the cabin are constructed in the same manner as are the decks of the boat, that is to say, from slabs or layers of plastic material and an interposed foraminous reinforcing sheet. The roof of the cabin is indicated by the numeral 46, and is similarly formed, and this roof is preferably provided with ventilators 47, of the ordinary type. The cabin is provided in its side walls with windows 48, and in its stem wall or end with a door 49. At its stern end, the cabin is provided with a door 50, and side doors 51, and steps 52 and 53, lead downwardly from the doorways 49 and 50, respectively, to the floor of the cabin. Seats 54, are preferably arranged at each side of the cabin and beneath the same are arranged lockers 55, closed by doors 56. Ventilators 57, are arranged beneath the roof of the cabin in the side and forward walls thereof.

Railings 58 and 59 are preferably arranged around the stem and stern bulwarks 60 and 61 of the boat, as are also seats 52.

In the form of the invention shown in Fig. 5, of the drawings, the principles of the invention may be embodied in the construction of small boats, such as fishing smacks, sail boats, row boats, and the like. In the said figure, a reinforcing rod 62, is embedded in the hull of the boat near the upper edge of each side of the hull and a similar rod 63, is embedded in the hull at the center of the bottom thereof and in a vertical plane with the keel and the center beam 11. Reinforcing wires or rods 65, are secured at their ends to the rods 62, and are embedded in the material of the hull and extend from side to side thereof and are interwoven with longitudinally extending wires 66, also embedded in the material of the hull.

From the foregoing it will be readily understood that the improvements of the present invention may be embodied in the construction of any type of boat, and that the hull of such a boat will not be liable to become fouled with barnacles due to the porous nature of the material from which it is made. It will be further understood that the reinforcing means employed will prevent injury to the hull due to impact and that the hull will require no calking.

Having thus described my said invention, what I claim as new and desire to secure by United States Letters Patent is:

A device of the character described including a concrete hull having a keel, lengthwise running reinforcing rods having eyes, embedded in said hull, embedded transverse U-shaped strut rods passing through said eyes, oppositely positioned apertured bars embedded within said hull the ends of said strut rods being secured within apertures of said bars, lengthwise running reinforcing wires embedded within said hull below said strut rods, and a plurality of strut wires threaded through the apertures of said bars and intertwined between said reinforcing wires, as shown.

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

HARVEY ELVIN SMITH.

Witnesses:
JAMES RUSSELL,
HARRY OUBRIDGE.

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