

D. De Haven,

Ship Building.

No. 105,437.

Patented July 19, 1870.

Fig. 1.

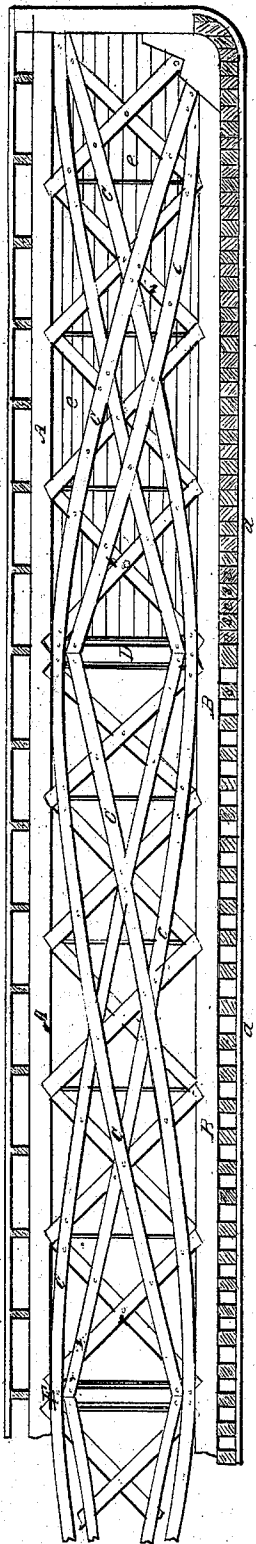


Fig. 3.

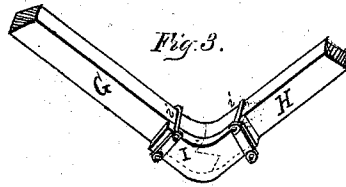
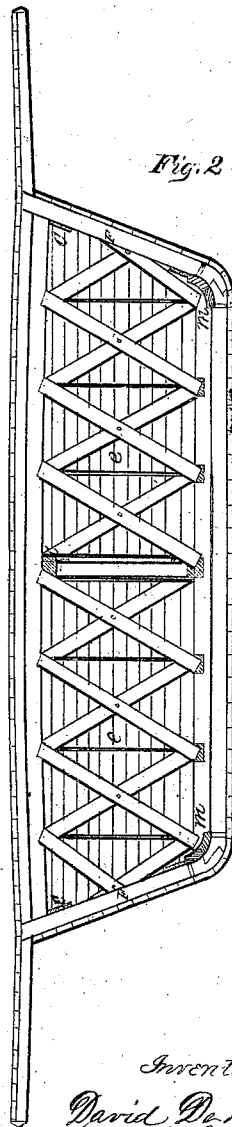


Fig. 2.



Witnesses.
C. V. Flora
Wm. C. Stineback

Inventor.
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by his Atty.
A. M. Councilman

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DAVID DE HAVEN, OF NEW ORLEANS, LOUISIANA.

Letters Patent No. 105,437, dated July 19, 1870.

IMPROVEMENT IN HULLS OF VESSELS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, DAVID DE HAVEN, of New Orleans, in the parish of Orleans and State of Louisiana, have invented an Improvement in the Construction of the Hulls of River Steamers and other Vessels; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing making part of this specification—

Figure 1 being a longitudinal vertical section of a portion of the hull;

Figure 2 being a transverse vertical section of the hull;

Figure 3, a view enlarged of the stirrup-fastening.

Like letters of reference designate corresponding parts in all the figures.

The object of my improvement is to strengthen the hulls of light-draught vessels, steamers, so as to enable them to carry heavy low-pressure machinery, if it is desired, and heavier cargoes, without the consequent danger of lateral and longitudinal sagging, so commonly seen in light-draught steamers as at present constructed.

I also claim that there is an advantage in point of speed in vessels with stiff and rigid hulls over those constructed in the ordinary way, as the resistance is less, and more powerful machinery may be applied without injury to the hull.

Another important feature of my invention is the facilities the system of lateral and longitudinal trussing affords for dividing the hull into water-tight compartments, by means of which a much greater degree of safety for both cargo and passengers is obtained, as steam or vacuum-pumps may be placed in each compartment to expel any water that may find an entrance.

Another important feature of my invention is a mode of securing the side timbers to the floor-timbers of the vessel, to form a stirrup-fastening for the futtock. This will be explained further on.

The arrangement for preventing sagging longitudinally consists of a lattice truss, with vertical straining-rods, of iron. This truss, A A, extends the entire length of the hull, from stem to stern-post, amidship, and rests on the keelson B.

Combined with the truss A A is a series of vertical arch clamp-strakes, C C, all of the timbers of which are spiked or bolted firmly to those of the truss, and also extending throughout the entire length of the hull.

The arrangement of the clamp-strakes to produce the greatest strength with the least possible weight of material will be more fully understood from the drawing than from a written explanation; but it will be

seen that each right arch strake heels at the intersection of one of the athwart-ship sections D, and passes thence upward and under the upper chord of the next section, E, and heels at the third.

The reversed arch strakes heel at the crowns of the right arches, and pass under the next adjoining athwart-ship section.

There are four sets of these clamp-strakes in each series—two right and two reversed sets of arches—and three series of strakes, viz., one on the keelson, amidships, shown in the drawing, and one on each side of the hull. These latter are spiked or bolted firmly to the inside of the side timbers F F, fig. 2, of the vessel, and extend throughout the entire length of the hull. These are precisely like the one shown in the drawing.

The above described system of trussing secures longitudinal rigidity; but to prevent the sagging of the knuckles *m m*, or breaking down of the extreme wing keelsons, the hull is laterally braced by a series of athwart-ship sections, (see fig. 2,) of lattice truss. This is sufficient in itself to give ample strength to the hull, without combining with it a system of right and reversed arch clamp-strakes, such as is used in trussing longitudinally, which, however, may be used.

The number of athwart-ship sections will be governed by the length of the hull, but from four to six will generally be required.

The compartments formed by the longitudinal and lateral systems of trusses may be rendered water-tight by spiking suitable planking *e e* to the lattice trusses, and calking in the usual manner.

Access to one compartment from another may be had by making a section of the truss to swing, in the manner of some bridges.

To give the flat floor or bottom of the hull *a a* strength proportionate to the other parts, and to prevent its being penetrated by snags, the spaces between the floor timbers *s s*, which are usually of oak, are filled by timbers of yellow pine, *c c*, thus making a solid bottom to receive the planking, as shown in the forward portion of fig. 1.

Fig. 3 shows the manner of forming the futtocks. The ordinary manner of securing the side timbers or ribs of a vessel to those of the bottom is simply to abut the ends of the timbers together, and then spike on the knee.

My improvement consists in "jogging" together, as shown in dotted lines, the curved ends of the side timber G, and bottom or floor timber H; then securing them firmly together by means of stirrups *i i*, provided with double washers and nuts.

The advantage of this mode of fastening consists in its strength, and the facilities it affords over the

ordinary way of taking up any looseness that may at any time exist, caused by rough usage of the vessel.

Having thus described my invention,

What I claim, and desire to secure by Letters Patent, is—

1. The trusses A A, provided with the right and reversed clamp-strakes C C, bolted thereto, substantially as described, the said trusses extending through the sides of the vessel, and longitudinally and transversely through partitions between water-tight compartments thereof, as herein specified.

2. The arrangement of the timbers G H, "jogged" together, and the knee I, secured thereto by the stirrup-clamps *i i* and keys, as and for the purpose herein set forth.

Witness my hand, this 23d day of December, 1869.

DAVID DE HAVEN.

Witnesses:

HENRY CONNETT, Jr.,

O. V. FLORA.