

(No Model.)

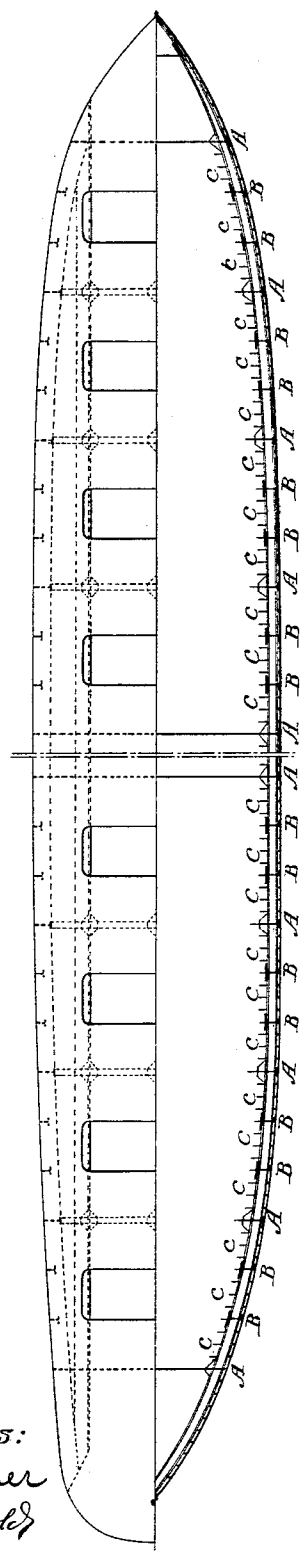
2 Sheets—Sheet 1.

J. HAUG.
SHIP CONSTRUCTION.

No. 586,436.

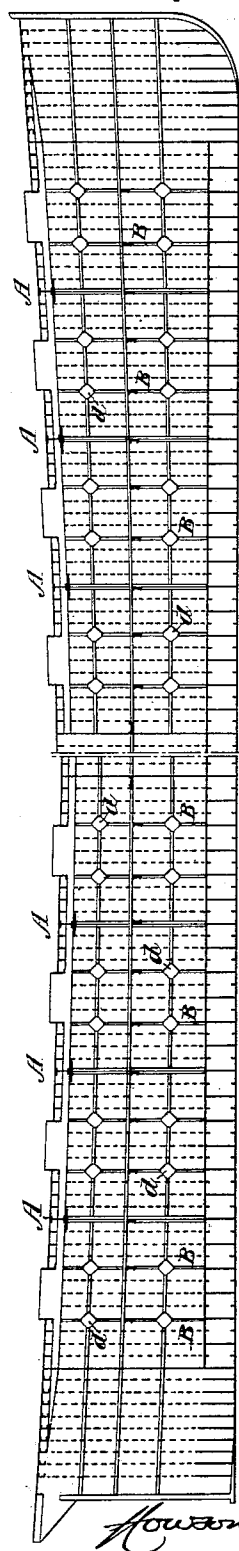
Patented July 13, 1897.

FIG. 1.



Witnesses:
R. S. Turner
L. E. Becktoled

FIG. 2.



Inventor:
John Haug
by his Attorneys
Howland & Howland

(No Model.)

2 Sheets—Sheet 2.

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FIG. 5.

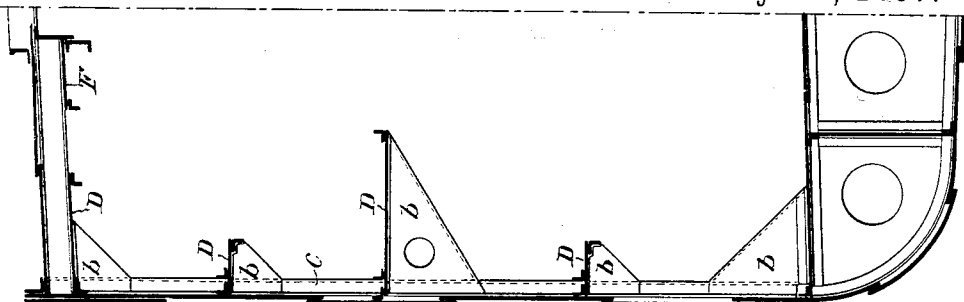


FIG. 4.

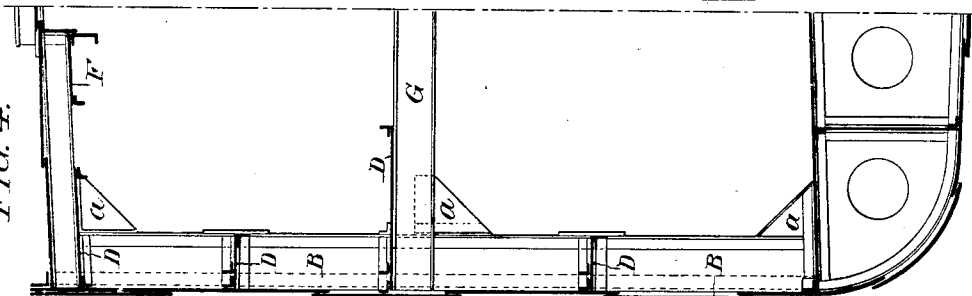
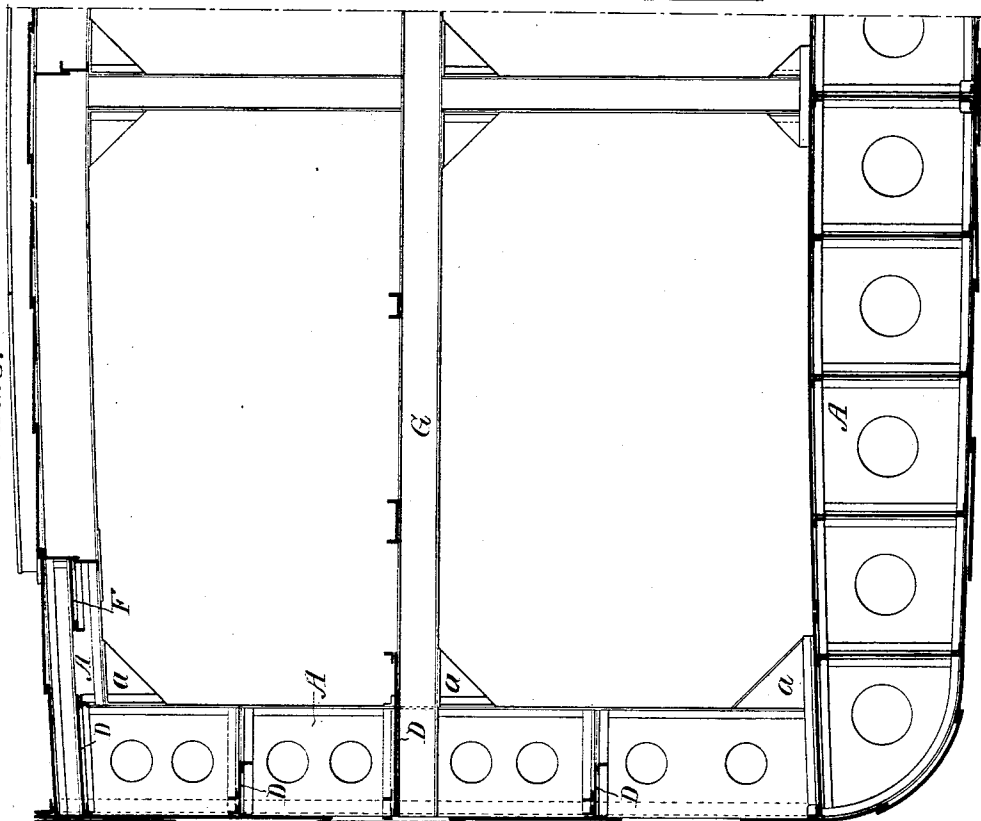


FIG. 3.



Witnesses:
Hamilton S. Turner
L. C. Bechtold

Inventor:
John Haug
by his Attorneys
Howson & Howson

UNITED STATES PATENT OFFICE.

JOHN HAUG, OF NORRISTOWN, PENNSYLVANIA.

SHIP CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 586,436, dated July 13, 1897.

Application filed October 9, 1896. Serial No. 608,370. (No model.)

To all whom it may concern:

Be it known that I, JOHN HAUG, a citizen of the United States, residing in Norristown, Pennsylvania, have invented certain Improvements in Ship Construction, of which the following is a specification.

My invention relates especially to the construction of vessels intended for carrying cargoes in bulk, such as grain, ore, coal, &c., these vessels being usually constructed with numerous and very wide hatches, in order to facilitate quick handling of the cargo.

By reason of the multiplicity and width of these deck-hatches the vessel is much weakened transversely, especially as in such vessels the usual intermediate decks and most of the intermediate beams are also omitted, thereby further reducing the transverse strength. Hence there is considerable vibration of the structure when under way, and the general strength and cohesion of the structure is endangered by the insufficiency of transverse connections. In order to overcome these objections, I propose to provide the structure with a series of deep girder-frames disposed at intervals throughout the length of the same, and to further modify the usual construction with the purpose of increasing the general strength and rigidity of the structure.

In the accompanying drawings, Figure 1 represents a view, partly in plan and partly in sectional plan, of a vessel constructed in accordance with my invention, the midship portion of the vessel being removed. Fig. 2 is a longitudinal section of the same. Fig. 3 is a partial transverse section, on a larger scale, showing one of the deep girder-frames. Fig. 4 is a partial transverse section showing certain web-frames which are alternated with the deep girder-frames in the structure, and Fig. 5 is a transverse section through the ordinary framing of the ship.

The deep girder-frames A are extended completely around the vessel's section and are spaced at suitable intervals longitudinally. Thus, as shown in the drawings, a deep girder-frame is alternated with each of the hatches, occupying a position midway between the hatches, although this arrangement is simply shown as one instance of a construction embodying my invention, a greater or less num-

ber of these deep girder-frames being used, as desired.

In the construction shown in the drawings the girders of the double bottom constitute the lower members of the deep girder-frames, but in a vessel with an ordinary single floor deep girders will be carried across the vessel from side to side at the bottom in order to complete this member of each frame. Owing to the great strength and rigidity of these deep girder-frames their employment at appropriate points in the structure of the vessel very materially stiffens and strengthens such structure where they are introduced and consequently adds to the general strength of the structure to such an extent as to compensate for the weakness due to the number and width of the hatches employed.

In order to further increase the strength of the hull-frame, I alternate with the deep girder-frames web-frames B, of which as many may be used between successive girder-frames as the desired strength of the structure may suggest, two of these web-frames being shown in the present instance between successive girder-frames. The remaining frames C of the vessel are similar to those of ordinary construction.

Extending longitudinally along each side of the vessel and secured to all of the frames of the same are a series of longitudinal stringers D, which serve to connect the various vertical members of the framework, so as to unite them in a homogeneous structure, provide additional longitudinal strength, and guard against undue local strains, vibration, and other sources of weakness.

To the under side of the deck-frame on each side of the row of hatches I secure longitudinal shelf-plates F, which are also secured to the upper members of the deep girder-frames and serve to longitudinally stiffen this portion of the structure and counteract the so-called "racking" strains, which, when the vessel is in a seaway, tend to twist and distort the decks and upper works of the same.

The deep girder-frames may be composed of channel bars or plates stiffened by angles, suitable gussets *a* serving to secure these girders together at the angles and also to the hold-beams G, and the longitudinal stringers D may be secured to the framework of the ves-

sel by similar gusset-plates *b*, while diamond plates *d* serve to secure certain of the longitudinal stringers to the web-frames B.

Having thus described my invention, I
5 claim and desire to secure by Letters Patent—

1. A ship having deep girder-frames extending completely around its transverse section and spaced at intervals longitudinally,
10 substantially as specified.

2. A ship having deep girder-frames extending completely around its transverse section at suitable longitudinal intervals, said
15 deep girder-frames being alternated with web-frames and frames of the usual construc-

tion spaced intermediately of said deep girder-frames, substantially as specified.

3. The combination of the deck-frames with horizontal longitudinal shelf-plates secured to the under sides of said deck-frames, and
20 extending along each side of the row of hatches close to the sides of the same, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of
25 two subscribing witnesses.

JOHN HAUG.

Witnesses:

JOS. H. KLEIN,
F. E. BECHTOLD.