No. 847,677. PATENTED MAR. 19, 1907.

G. W. MAYTHAM.

SHIP CONSTRUCTION.

APPLICATION FILED JAN. 19, 1905.

3 SHEETS—SHEET 1.

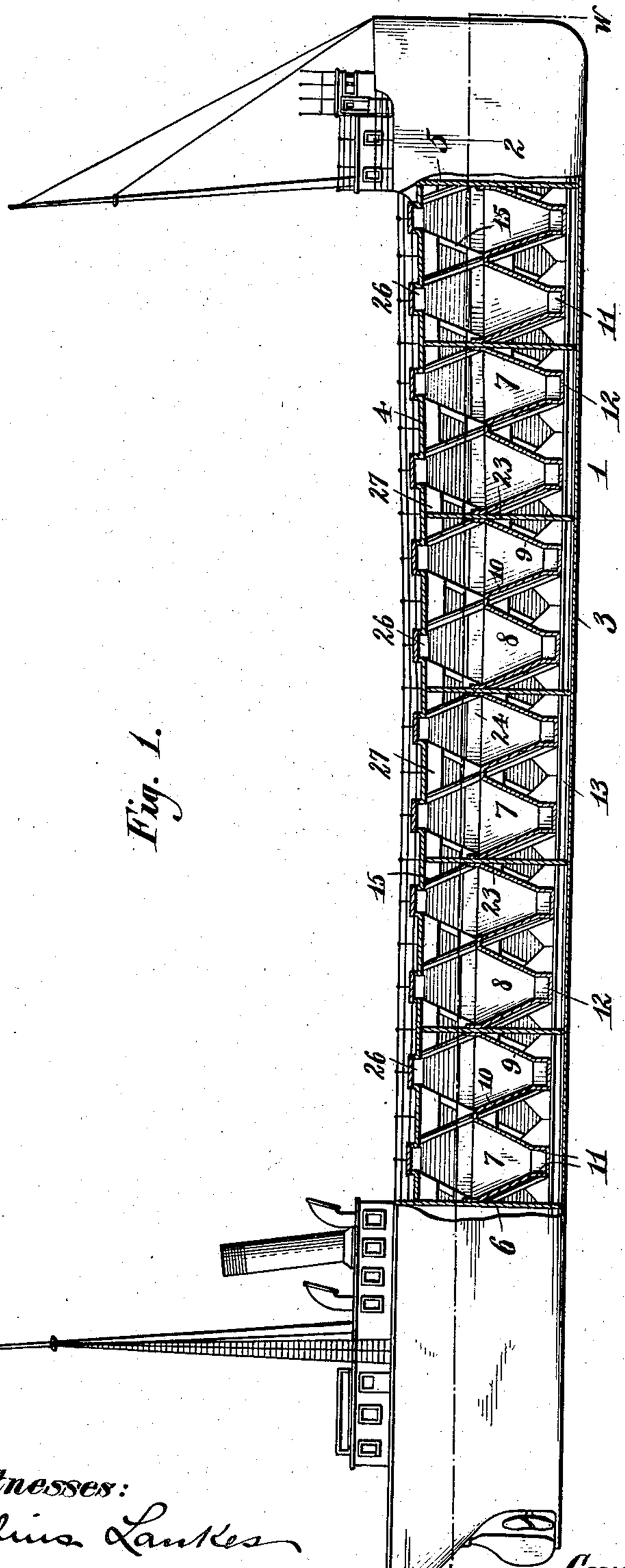

Fig. 1.

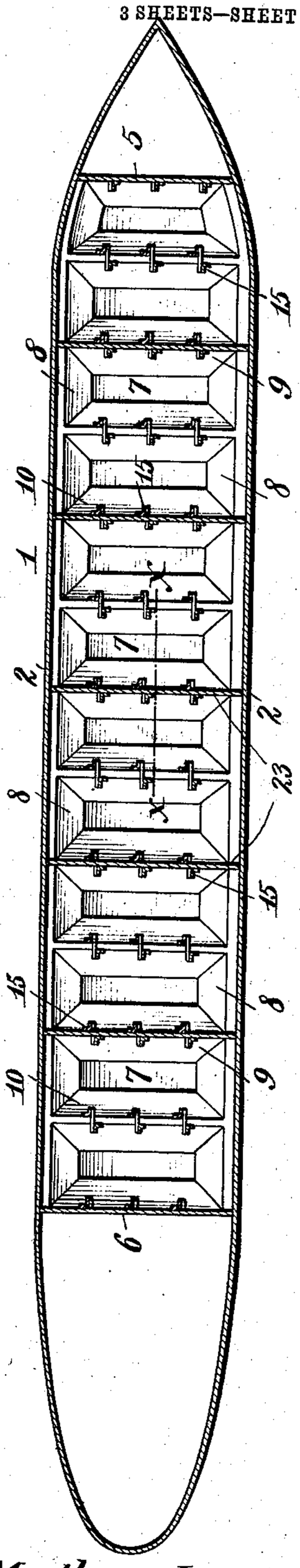

Fig. 2.

Witnesses:
Julius Lawkes
May Sewest.

George W. Maytham, Inventor:
By Neuhart & Burkhart Attorneys.

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3 SHEETS—SHEET 2.

Fig. 3.

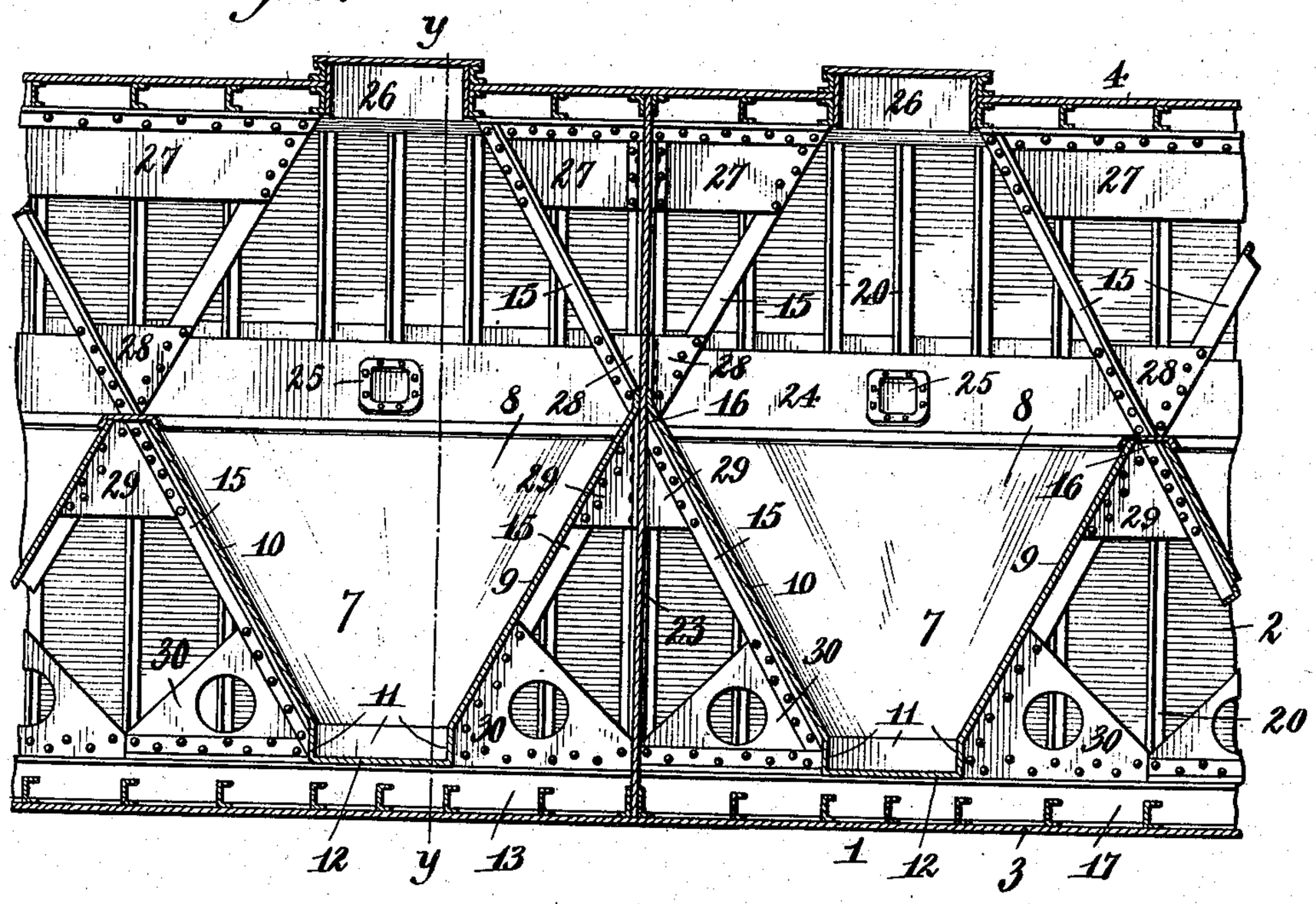
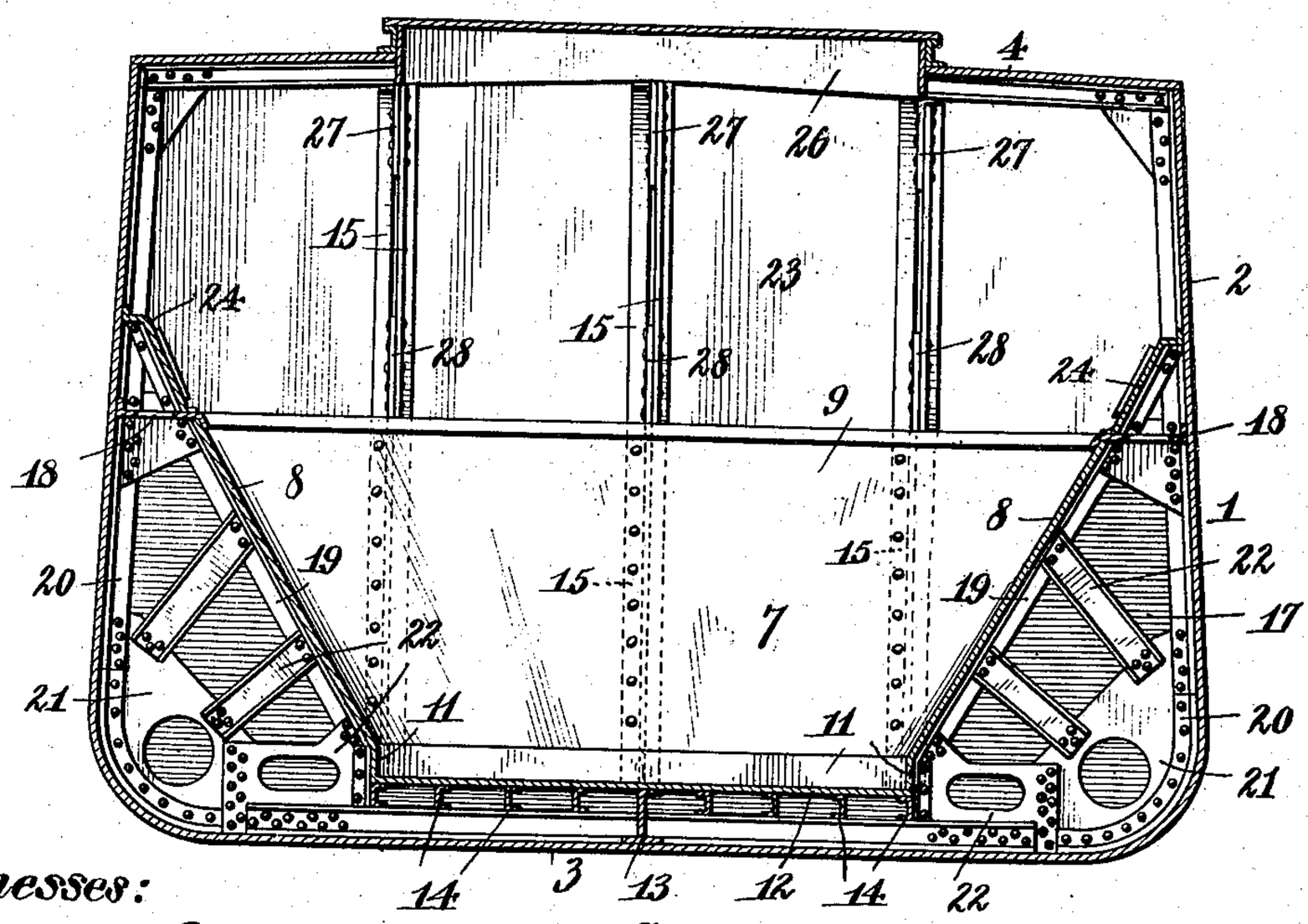


Fig. 4.



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Julius Lauke
May Sewert.

George W. Maytham, Inventor.
By Neuhart & Burkhard Attorneys

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3 SHEETS—SHEET 3.

Fig. 5.

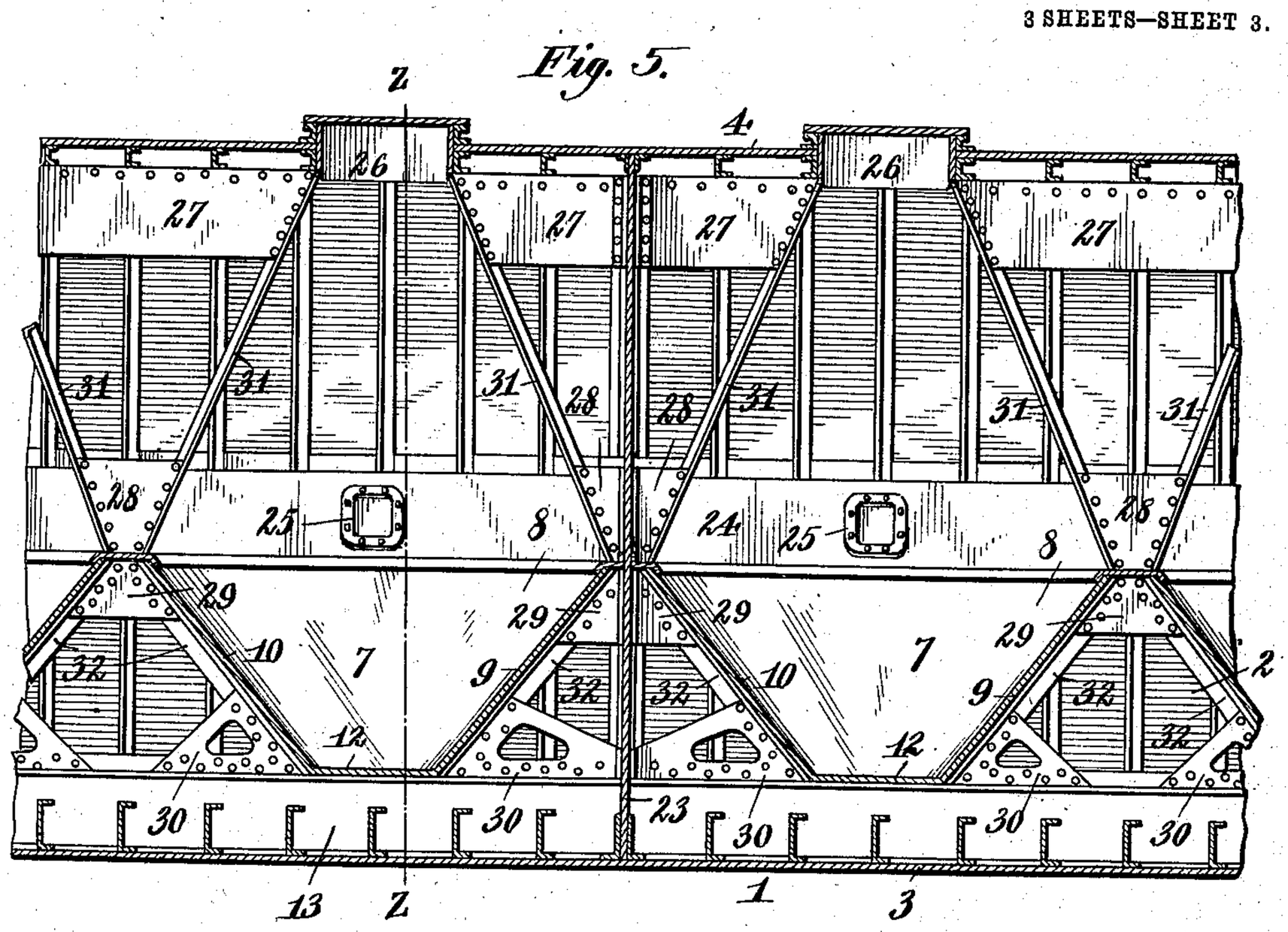
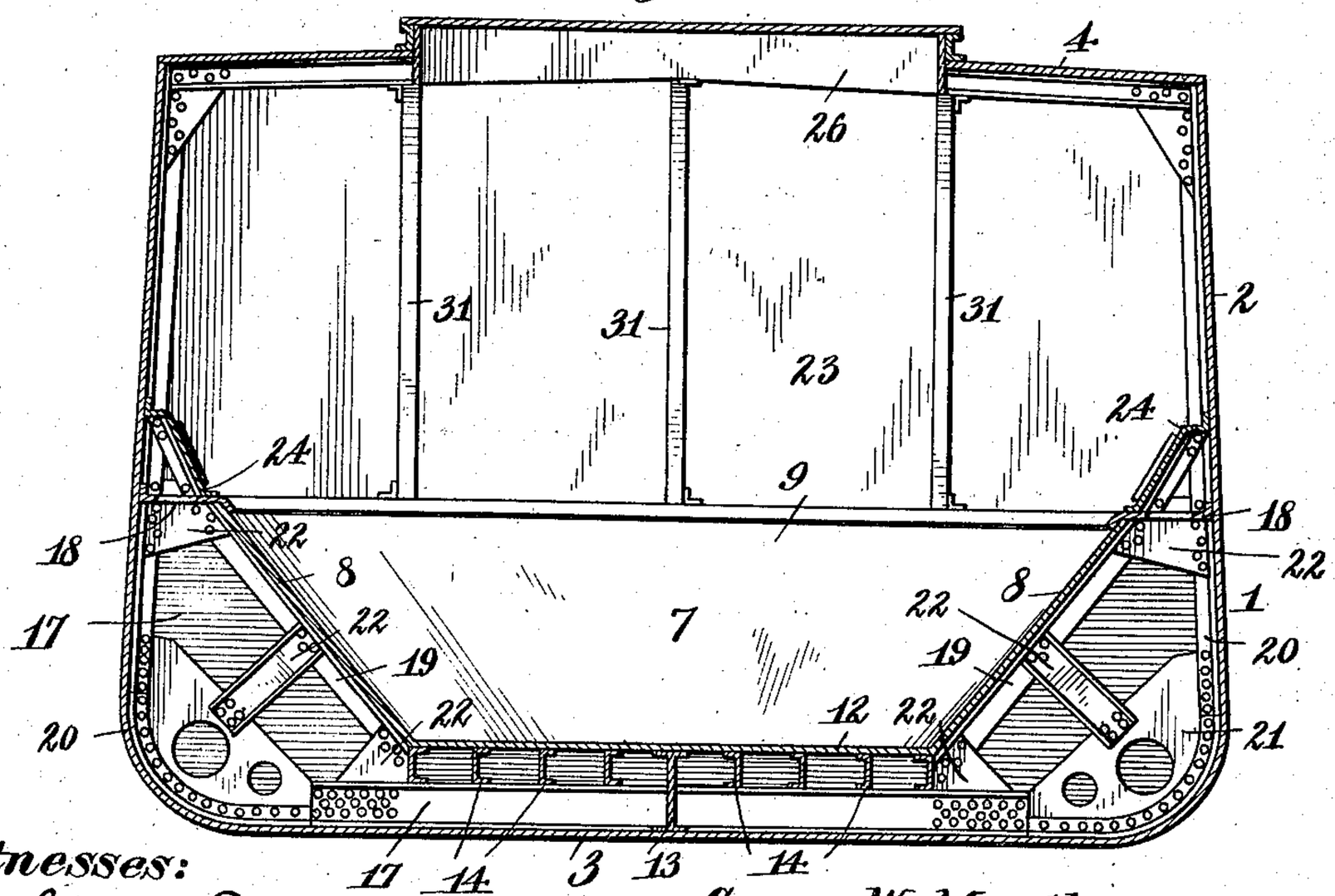


Fig. 6.



Witnesses:
Julius Lauke
May Sewert.

George. W. Maytham, Inventor.

By Neuhart & Burkhart Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE W. MAYTHAM, OF BUFFALO, NEW YORK.

SHIP CONSTRUCTION.

No. 847,677. Specification of Letters Patent. Patented March 19, 1907.

Application filed January 19, 1905. Serial No. 241,900.

To all whom it may concern:

Be it known that I, GEORGE W. MAYTHAM, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Ship Constructions, of which the following is a specification.

This invention relates to ship constructions; and its primary object is to provide a light and durable vessel having a series of hoppers forming the bottom of the hold with transverse bulkheads arranged between two contiguous hoppers at intervals in the length of the ship.

Other objects are to provide diagonal framing to support the inclined front and rear walls of the several hoppers and to rigidly brace the upper ends of said walls to the deck of the vessel, to provide a ship in which the framing also serves to prevent the shifting of grain when carried as a cargo, and to rigidly connect the diagonal framing with the center keelson and the bulkheads at points where the latter are used.

With these and other objects in view my invention consists in the construction, arrangement, and combination of parts to be hereinafter described, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a longitudinal sectional elevation of a ship constructed according to my invention. Fig. 2 is a horizontal section taken on line *w w*, Fig. 1. Fig. 3 is an enlarged horizontal section taken on line *x x*, Fig. 2. Fig. 4 is a transverse section taken on line *y y*, Fig. 3. Fig. 5 is a longitudinal vertical section of a portion of a ship, showing my invention in slightly-modified form. Fig. 6 is a transverse section taken on line *z z*, Fig. 5.

Referring to the drawings in detail, like letters of reference refer to like parts in the several figures.

The reference-numeral 1 represents the hull of the vessel, comprising the sides 2, bottom 3, and deck 4, the sides curving to meet at the bow and aft, as is common. The hull is provided with the usual compartments fore and aft for the crew and for engine and boilers, respectively.

A water-tight transverse bulkhead 5 is provided near the front end of the ship to separate the crew's compartment from the cargo-space, and a similar bulkhead 6 is arranged to separate the cargo-space from the engine and boiler rooms.

Within the hull I provide a series of hoppers 7, each comprising longitudinal inclined side walls 8, a transverse inclined front wall 9, and a transverse inclined rear wall 10, each inclined wall having at its lower end a vertical portion 11. Each hopper has a bottom 12, which is supported on the center keelson 13 and side keelsons 14.

15 designates diagonal or inclined stays or bars which extend from the bottom of the hull to the deck thereof. These bars are arranged in pairs and cross each other, as at 16, the lower ends thereof being securely riveted to the framing at the bottom of the hull and the upper ends thereof being likewise secured to the deck-framing. The front and rear transverse inclined walls of the hoppers are supported by and riveted to said inclined bars and serve with the latter to securely tie and brace the sides and the top and bottom of the hull together, thus forming an exceedingly light yet rigid construction.

Between the sides of the hull and the sides and bottom of the hoppers a water-ballast compartment 17 is provided.

The upper ends of the inclined sides of the hopper are connected to the sides of the hull by longitudinally-and horizontally disposed open plates 18. Said inclined sides are supported by and riveted to inclined supporting-bars 19, which are connected to the transverse framing 20 by bilge pieces or knees 21 and the tie-bars 22.

I also provide the ship with a number of bulkheads 23, which I arrange between the hoppers, so that the upper ends of the adjacent walls of such hoppers may be riveted to the bulkhead.

An inclined longitudinal wall 24 surmounts each of the open plates 18, to which they are secured, and at their upper ends these walls are connected to the sides of the ship, forming, in effect, a continuation of the inclined sides of the hoppers and serving to close the upper ends of the water-ballast compartment. In the wall 24, between the bulkheads 23, I form one or more manholes 25 to permit of entering the water-ballast compartment.

Directly above the center of each hopper a hatchway 26 is provided, which allows the leg of an elevator to be lowered directly into the hopper-bottom, and as the grain tends to move toward the center of the hopper the ship can be quickly and conveniently unloaded.

To prevent the shifting of a cargo of grain and cause listing of the ship, rigid shifting-plates 27 are provided at points between the hatchways and directly underneath the deck, the upper edge of said plates being riveted to the deck-framing, while the ends are riveted to the upper ends of the brace-bars, each plate lying between one pair of brace-bars. At points where the bulkheads 23 stand centrally between the brace-bars said shifting-plates are formed in two pieces, with adjacent ends secured to opposite sides of said bulkheads. Above the points where the brace-bars cross each other I provide shifting-plates 28, which are secured to said brace-bars in a manner similar to the shifting-plates 27.

At the upper ends of the space between the hoppers, which form continuations of the water-ballast compartment, I connect the diagonal stays or bars by tie-plates 29, and at the lower ends of said spaces tie-plates 30 brace the diagonal stays or bars to the keelsons. At points where the bulkheads 23 stand between the diagonal brace-bars the tie-plates 29 are divided and connect the said bars with the bulkheads.

In the modification shown in Figs. 5 and 6 diagonal stays or bars 31 extend from the top of two adjacent transverse inclined walls of the hoppers to the deck, while separate bars 32 extend from the lower ends of these stays or bars to the keelsons. The bars 32 are heavier than the stays or bars 31, since they serve to support the transverse walls of the hopper in addition to acting as braces, while the bars 31 serve simply to brace the structure.

Having thus described my invention, what I claim is—

1. A ship having a series of hoppers in its hold and diagonal bars extending from the bottom of the hold to the deck on which the inclined sides of the hoppers are supported, said bars being arranged in pairs and the bars of each pair being inclined in opposite directions.

2. A ship having a series of hoppers in its hold, and diagonal bars extending from the bottom to the top of the hoppers and being connected together at the upper ends of two adjacent hoppers.

3. A ship having a series of hoppers, a hatchway arranged over each hopper, and diagonal bars extending from the upper end of two adjacent hoppers to the deck, said bars being secured to the deck between said hatchways.

4. A ship having a series of hoppers, a hatchway arranged over the center of each hopper, and diagonal bars connected to the upper end of two adjacent hoppers and extending to the deck for connection near the sides of two adjacent hatchways.

5. A ship having diverging bars connected together and to the deck, and a shifting-plate secured to the separated ends of said bars.

6. A ship having diverging bars connected together and to the deck, a shifting-plate secured to the separated ends of said bars, and a shifting-plate secured to the connected ends of said bars.

7. A ship divided by transverse bulkheads into a number of cargo-compartments and having one or more hoppers in the bottom of each compartment, diagonal bars extending from the bottom of the hoppers along the front and rear inclined walls of the latter to the deck and being connected together at the upper ends of said inclined walls, and a hatchway in the deck above each hopper.

8. A ship having a series of hoppers in the bottom of its hold, a hatchway centrally over each hopper, and diagonal bars on which the inclined walls of said hoppers are supported, said bars extending from the bottom of the hold to the deck and having their upper ends secured to the deck between said hatchways.

9. A ship having diagonal bars arranged in pairs and extending from top to bottom in the hold, and shifting-plates secured to said bars.

In testimony whereof I have affixed my signature in the presence of two subscribing witnesses.

GEORGE W. MAYTHAM.

Witnesses:

CHAS. F. BURKHART,

M. SEWERT.