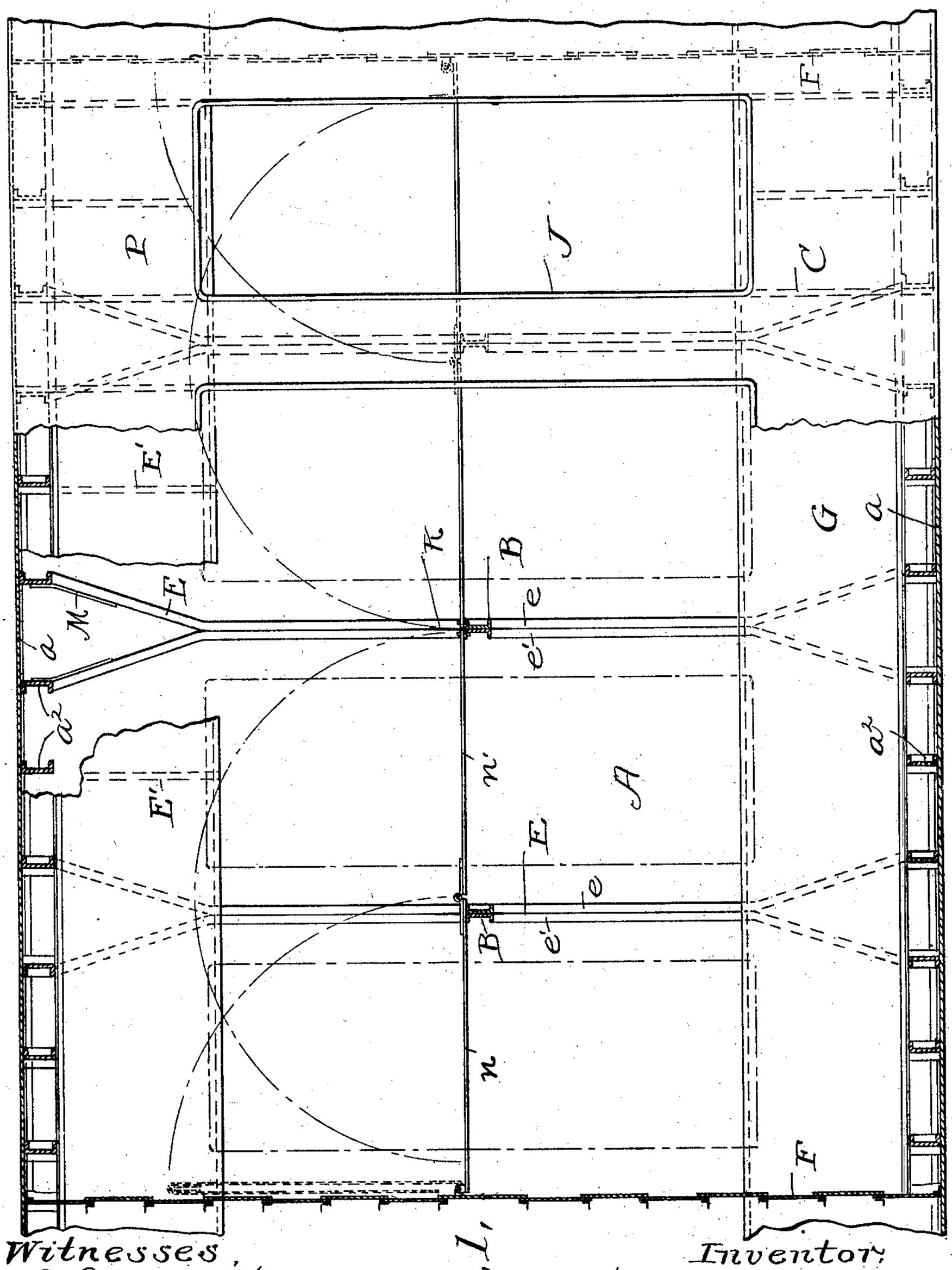
No. 706,708. Patented Aug. 12, 1902.

A. B. WOLVIN.

SHIP CONSTRUCTION.

(Application filed Jan. 17, 1902.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses,
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H. W. Wise.

Fig. 1.

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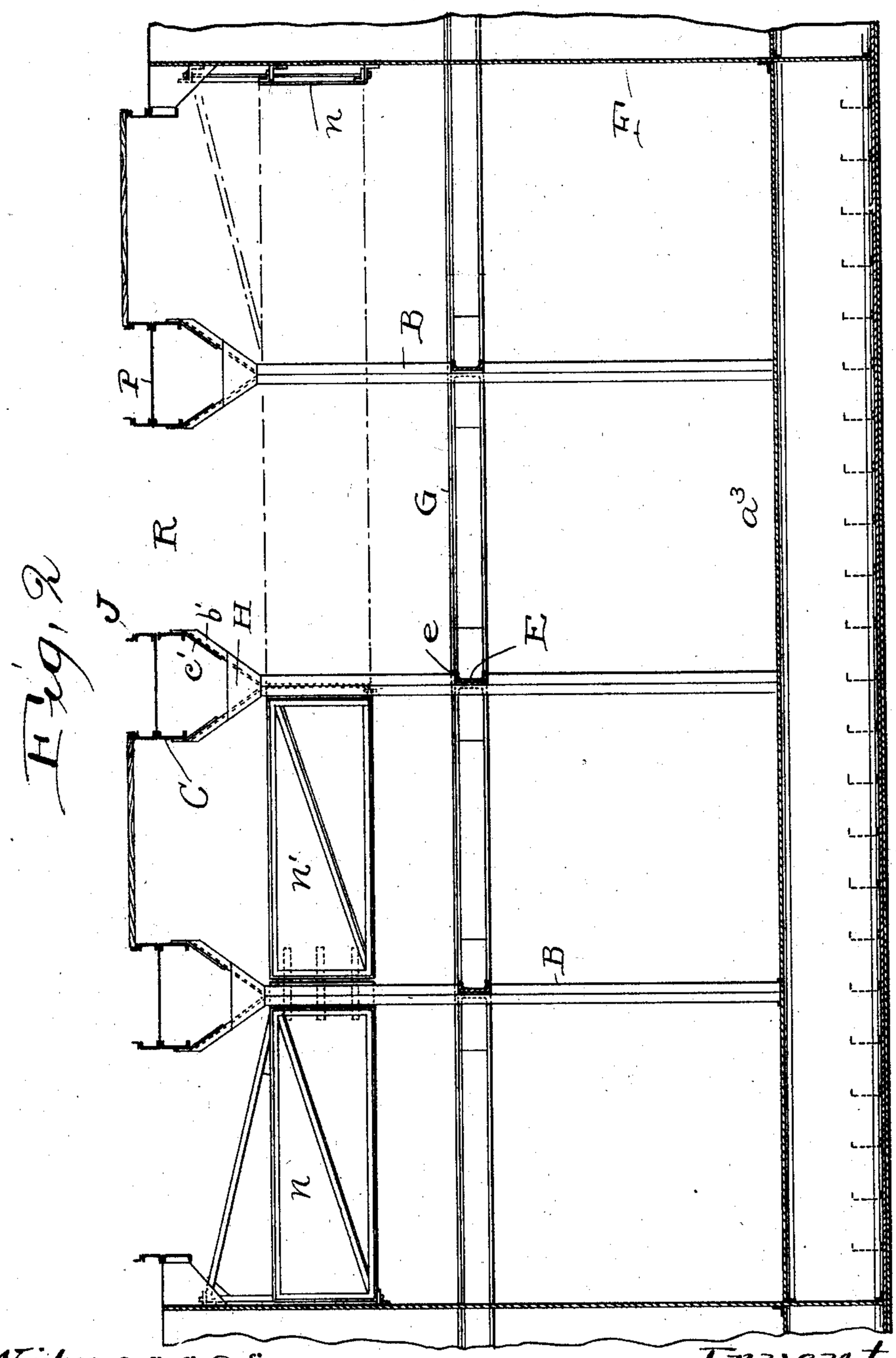

Fig. 2.

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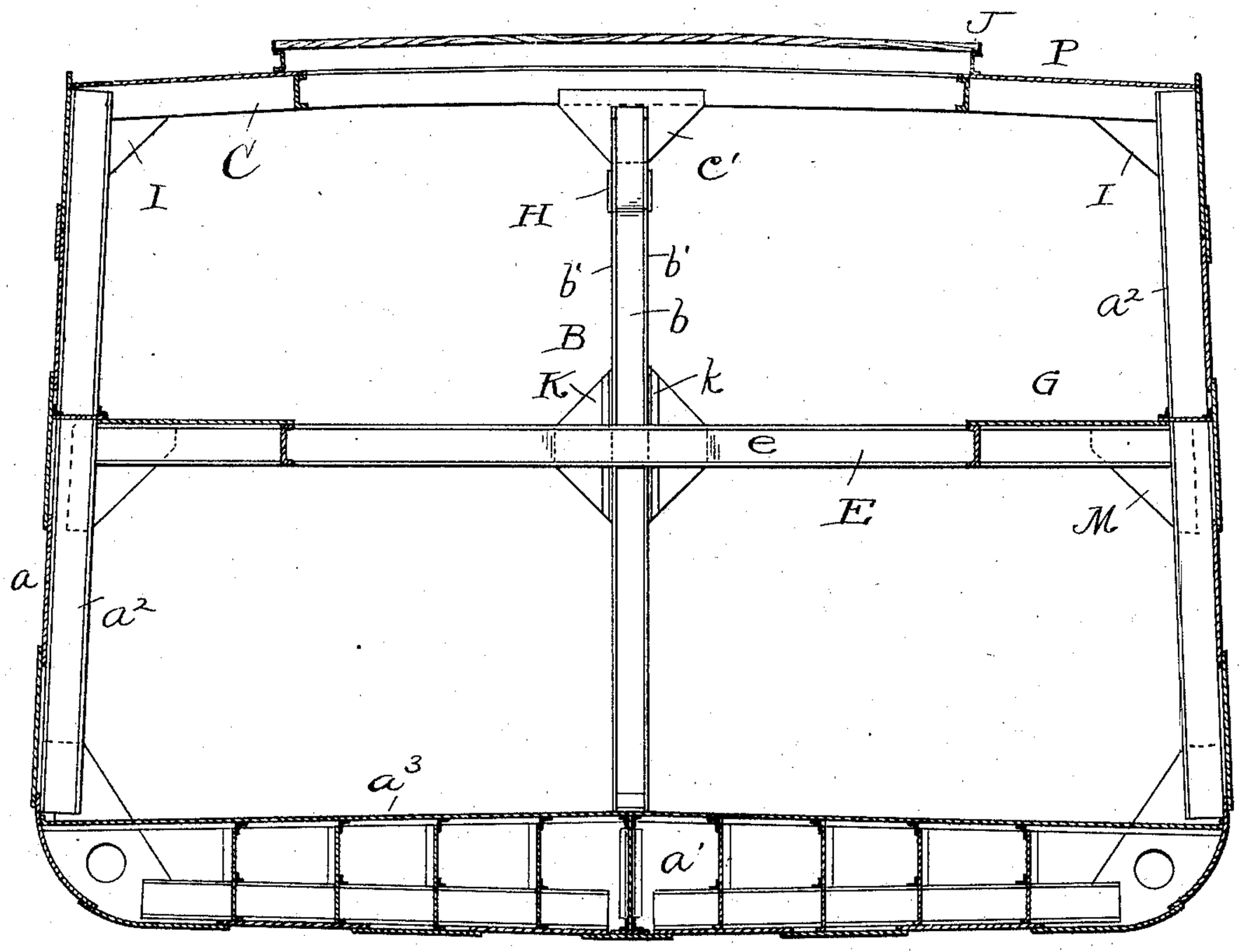
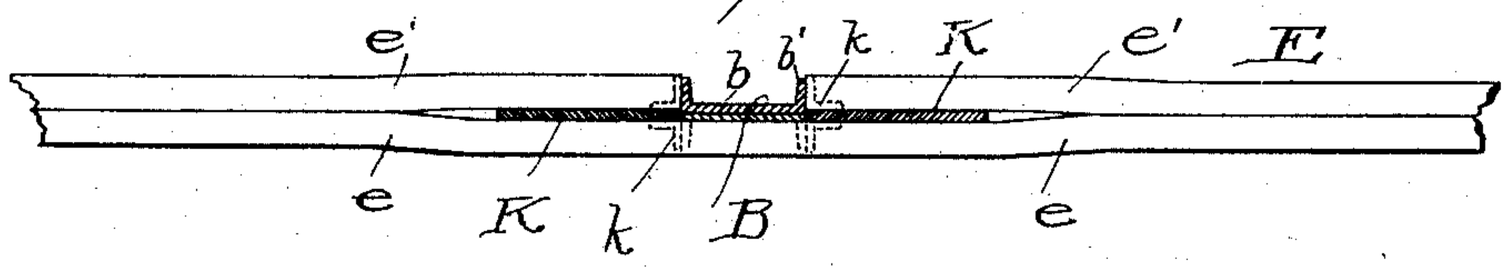


Fig. 3.

A

Fig. 4.



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UNITED STATES PATENT OFFICE.

AUGUSTUS B. WOLVIN, OF DULUTH, MINNESOTA.

SHIP CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 706,708, dated August 12, 1902.

Application filed January 17, 1902. Serial No. 90,194. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS B. WOLVIN, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented a certain new and useful Improvement in Ship Construction, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to the construction of ships especially adapted for the ore-carrying trade on the Great Lakes. In order that ships engaged in that trade shall be operated profitably, it is necessary that they be loaded and unloaded with the utmost despatch. With that end in view the Lake Superior ore-docks are provided with pockets or bins having chutes or spouts through which the ore may be discharged into the hold of a ship through the hatches thereof. With the same end in view the ore-receiving docks in the Lake Erie and Lake Michigan ports are provided with ponderous unloading machinery, some portion of which passes through the hatches of the ship down into the hold. The most advanced type of such unloading machinery automatically picks up in the hold great quantities of the ore and lifts it out through the hatches and discharges it onto the ore-pile or into cars. Experience has shown that the pockets on the ore-docks are most practical, in view of existing conditions, when they have a dock frontage of about twelve feet. They are then adapted to the construction of the ore-cars from which they are filled, they hold a convenient quantity of ore, and they are perhaps of the most convenient practical size for use in loading the ships now engaged in the ore-carrying trade. They would not be practical if made much, if any, larger, because of the disposition of the ore, especially if wet, to pack in the pockets. As it is the most serious delays incident to the loading of ships at these docks is due to the packing of the ore in the pockets. For this reason it is probable that these pockets would be made smaller if it had heretofore been possible to construct ships which would permit the hatches to be placed nearer together than they are. As a matter of fact, however, the construction of the ore-docks has become standardized, and all of them constructed recently have pockets whose discharge-spouts are twelve feet apart. It is evident that at these particular ore-docks ships could be loaded most quickly if their hatches were twelve feet between centers, because the ore could then be simultaneously discharged into the ship from consecutive pockets for the entire distance between the fore and aft hatches. Notwithstanding this obvious advantage of having the hatches of these ore-carrying ships thus near together, there is not in the ore-carrying trade to-day a single ship capable of being so loaded from contiguous pockets. All of the ships built in recent years for the ore-carrying trade—ships constructed with all of the skill at the command of the builders who had a complete appreciation of the practical advantages of a ship capable of being so loaded at these ore-docks—have their hatches twenty-four feet between centers. It is therefore necessary in loading these big ships, most of which carry more than five thousand tons of ore, to take the ore from alternate pockets and then to shift the ship fore or aft about twelve feet and take the ore from the intermediate pockets. It obviously required more than twice as long to load such a ship than it would if the ore could be simultaneously discharged through the hatches from contiguous pockets.

With the advent in very recent years at the ore-receiving docks of ponderous unloading machinery the problem of constructing a ship to adapt it to the conditions at the unloading as well as the loading docks has become more difficult. Some of this unloading machinery projects through the hatches automatic digging mechanism which picks up great quantities of the ore, in some cases seven or eight tons, more or less, and lifts it out and deposits it in the cars or on the ore-pile. For the rapid and economical operation of this machinery it is necessary that the ship's hold be as clear of the stanchions and other parts of the framework as possible, because they impede the operation of the machinery, and they are extremely liable to injure such machinery and to be injured by it. The problem, therefore, which is presented to the builders of ships for the ore-carrying trade is how to build large ships adapted to the conditions existing at both the loading

and unloading docks. It is believed that the construction shown in the drawings and hereinafter described and claimed solves this problem to a degree far in advance of any previous construction and solves it in a simple and inexpensive manner.

The invention may be here summarized as consisting in the construction and combination of parts shown in the drawings, as pointed out definitely in the claims.

In the drawings, Figure 1 is a plan view of a part of a ship embodying the invention with portions of the spar-deck and of the main deck broken away to show as much of the construction as may be shown in such a view. Fig. 2 is a longitudinal sectional view of a part of a ship embodying the invention. Fig. 3 is a transverse sectional view of the same. Fig. 4 is an enlarged sectional plan view of the stanchion and the main-deck beams adjacent thereto, showing the manner in which they are connected.

It will be understood that while the drawings show only so much of the ship construction as is found between two adjacent bulkheads the construction shown may be repeated as many times as is necessary to produce a hold of the desired length. The construction of the ship forward and aft of the hold may be as usual in ships of this class.

I will now describe in detail the construction shown in the drawings embodying the invention.

Referring to the parts by letters, A represents the hull of the ship, which hull is of familiar construction in respect to its external walls *a*, its center keelson *a'*, its internal vertical side frame members a^2, and the floor a^3 of the hold. The vertical side frame members a^2 are placed equal distances apart, and if the hatches are to be twelve feet between centers, as shown, these frame members are substantially four feet apart. Extending across the hold at suitable distances apart, preferably forty-eight feet, are bulkheads F of familiar construction.

Rising from points directly over the center keelson *a'* are a plurality of stanchions B, which are suitably secured at their lower ends and extend up to the spar or upper deck P and are located in transverse planes substantially midway between two adjacent vertical frame members a^2 and, as will presently appear, midway between adjacent hatches R. The spar-deck beams C extend transversely across the ship, their ends being connected to those side frame members a^2 which are next on opposite sides of the transverse planes in which said stanchions are located, said connections preferably being made by gusset-plates I. These stanchions are column-like structures, which, as shown, are made of two channel-bars *b b*, riveted together back to back from their lower ends up to within two feet, more or less, of said deck-beams C. At the upper ends of these stanchions are diverging arms formed by bending apart the stanchion members *b b*, and their upper ends are secured to said deck-beams by means of transverse gusset-plates *c'*. Other longitudinal gusset-plates H connect together the two members *b b* of said stanchions at and for a short distance above the points where their divergence begins, said gusset-plates being riveted to the flanges *b'* of said stanchion members.

The main deck G, as is common in ore-carrying ships, is merely a shelf extending inward from the sides of the hull. This deck is supported by transverse main-deck beams E, each of which is made, as shown, of channel-irons *e e'*, placed back to back and riveted together. One of these members *e* is continuous from one side of the ship to the other and lies against the outer face of one of the stanchion members, the flanges *b'* of said member being cut away to permit such engagement. The other member *e'* is made of two bars, each of which is butted against a flange *b'* on the other stanchion member, and each of these bars *e'* extends from the stanchion toward the side of the ship. A vertical gusset K lies on each side of the stanchion and between the members *e e'* of the deck-beams. These deck-beams are riveted to these gusset-plates, and the gusset-plates are secured to the flanges of the stanchions by means of the angle-irons *k*. The outer ends of the members *e e'* of each of these deck-beams E diverge, as shown in Fig. 1, the divergence beginning at points near the inner edge of the main deck. The diverging arms or ends of these deck-beam members *e e'* are fastened by means of a bracket-plate M to the same vertical frame members a^2 to which the deck-beams C are fastened. Short substantially horizontal beams E' project inward from the vertical frame members a^2, which are intermediate of those frame members to which the ends of the deck-beams E are secured, said short beams E' being connected with said frame members a^2 by means of bracket-plates M. Those parts of the members *e e'* of the deck-beams E which lie between the gusset-plates K and the points where said members diverge, as stated, are riveted together. It is customary in ship construction to rivet together the various parts, and it is believed that the parts hereinbefore described as "connected together" may be most satisfactorily connected in this way—namely, by rivets.

The hatch-comings J, or rather the transverse members thereof, are secured above and to the transverse spar-deck beams C. It is apparent, therefore, that in the described construction the stanchions B are midway between the hatches. When the distance between the frame members a^2 is substantially as specified in the construction described the distance between the centers of these hatches will be twelve feet. The hatches themselves are preferably eight feet wide—that is to say, eight feet measured lengthwise of the ship.

In that event the distance between proximate edges of the hatches will be about four feet. It is, however, posssible to place the hatches even nearer together than is shown and described, and therefore the construction described is adapted not only for ships which may be loaded simultaneously from contiguous ore-pockets on the docks now used, but for ships designed to be so loaded on docks when the pockets were smaller and their discharge-spouts nearer together than at present. This construction, therefore, attains one result sought for—to wit, of adapting the ship to be loaded from contiguous pockets, such as are found on the ore-docks as at present constructed, or as they are ever likely to be constructed, because if any changes are ever made in the size of the pockets they will be made smaller. There is also a minimum amount of framework in the hold to interfere with the operation of the unloading machinery at the ore-receiving docks, because there is nothing between the sides, excepting only the column-like vertical stanchions placed twelve feet apart and midway between the centers of contiguous hatches, the shelf-like main deck, and the transverse main-deck beams E. Never before in ship construction has there been constructed a ship so free in the hold of frame members, and consequently so well adapted to the employment of the labor-saving vessel-unloading machinery found at the ore-receiving docks.

As heretofore stated, the described construction is especially suited to the ore-carrying trade on the Great Lakes. It is desirable, however, that ships engaged in this trade shall also be adaptable for carrying grain—a cargo especially liable to shift from one side of the ship to the other in heavy weather. To prevent such movement of the grain, shifting boards may be used, said shifting boards forming a longitudinal partition in the hold at such an elevation that the lower edges of these boards will project a short distance below the surface of the grain. The shifting boards shown in the drawings consist of two members n n', of which the member n is hinged on a vertical pivot to the bulkheads or other suitable support. The outer member n' is hinged on a vertical pivot to the free end of the member n. These two members n n', so connected with each other and with the bulkheads, are capable of being folded upon each other and toward the side of the ship, substantially as shown at the right side of Fig. 2, when they lie against the bulkhead and are thus entirely out of the way. When the loading of the ship with grain is nearly completed, these shifting boards are swung out, as shown at the left of Fig. 2, where they extend lengthwise of the ship, and each member lies against and is secured by appropriate means to one of the stanchions.

Having described my invention, I claim—

1. In ship construction the combination of a hull having internal vertical side frame members, vertical stanchions rising from points above the center keelson and midway between the hatches, each consisting of two members secured together from their lower ends up to the points near their upper ends, from which points said members diverge, transverse spar-deck beams secured to the side frame members and to the diverging upper ends of the stanchion members, transverse main-deck beams composed of two members which are connected together and to a stanchion and have diverging outer ends which are connected with the vertical side frame members, whereby the deck-beams are supported by the stanchions and serve to tie the sides of the hull together, substantially as specified.

2. In ship construction the combination of a hull having internal vertical side frame members, stanchions rising from points above the center keelson and midway between the hatches and extended up to the spar-deck, each stanchion consisting of two channel-bars secured together back to back from their lower ends up to a point near the upper deck, from which point they diverge fore and aft, transverse spar-deck beams secured to the side frame members and to the diverging upper ends of the stanchion members, main-deck beams consisting of channel-bars secured together back to back but diverging at their outer ends, said main-deck beams being secured to said stanchions and having their outer diverging ends secured to the vertical frame members, substantially as specified.

3. In ship construction the combination of a hull having internal vertical side frame members, stanchions rising from points above the center keelson and midway between the hatches and each consisting of two channel-bars secured together back to back but diverging at their upper ends, transverse spar-deck beams secured to the frame members, transverse gusset-plates connecting the upper ends of said stanchion members with said deck-beams, longitudinal gusset-plates connecting together the diverging upper ends of the stanchion members, and transverse main-deck beams secured to said stanchions and having at their outer ends diverging arms which are connected with side frame members, substantially as specified.

4. In ship construction, the combination of a hull having internal vertical side frame members, stanchions rising from points above the center keelson and midway between the hatches, each stanchion consisting of two channel-bars riveted together back to back but having diverging upper ends, transverse spar-deck beams secured to the side frame members and to the diverging upper ends of the stanchion members, transverse main-deck beams each consisting of a bar e which lies in a transverse groove in the flanges of one of the stanchion members and is riveted to the stanchions and has its ends bent out of line and secured to two of said side frame

members, and two bars *e e'* which are butted against the stanchions on opposite sides and extend therefrom toward the sides of the hull and have their ends bent out of line and secured to the side frame members, gusset-plates lying on opposite sides of the stanchion and between the deck-beam members *e e'* and secured to said deck-beam members, and angle-irons fastened to said gusset-plates and to the stanchions, substantially as specified.

5. In ship construction the combination of a hull having internal vertical side frame members, a plurality of hatches in the spar-deck, bulkheads extending transversely across the hold and secured to the hull, vertical stanchions rising from points above the center keelson and midway between the hatches and having diverging arms at their upper ends, transverse spar-deck beams secured to the side frame members and to the diverging upper ends of said stanchions, transverse main-deck beams which are secured to said stanchions and having diverging ends which are secured to the side frame members, substantially as specified.

6. In ship construction the combination of a hull having internal side frame members, bulkheads extending across the hold at suitable intervals and secured to the hull, and shifting boards, each consisting of two members hinged together on a vertical pivot, and a hinge connection between one member of each shifting board and an adjacent bulkhead, substantially as specified.

7. In ship construction, the combination of a hull and vertical frame members in the hold midway between the sides of the vessel, shifting-board sections hinged to said frame members, and other shifting-board sections respectively hinged to the outer ends of the sections first referred to, whereby the two connected members of the shifting-boards are capable of being folded together and then swung around into a position crosswise of the ship, or unfolded and swung into a position lengthwise of the ship, substantially as specified.

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

AUGUSTUS B. WOLVIN.

Witnesses:
FRANK H. SHIPE,
C. M. COLLINS.