

A. M. BOWMAN.

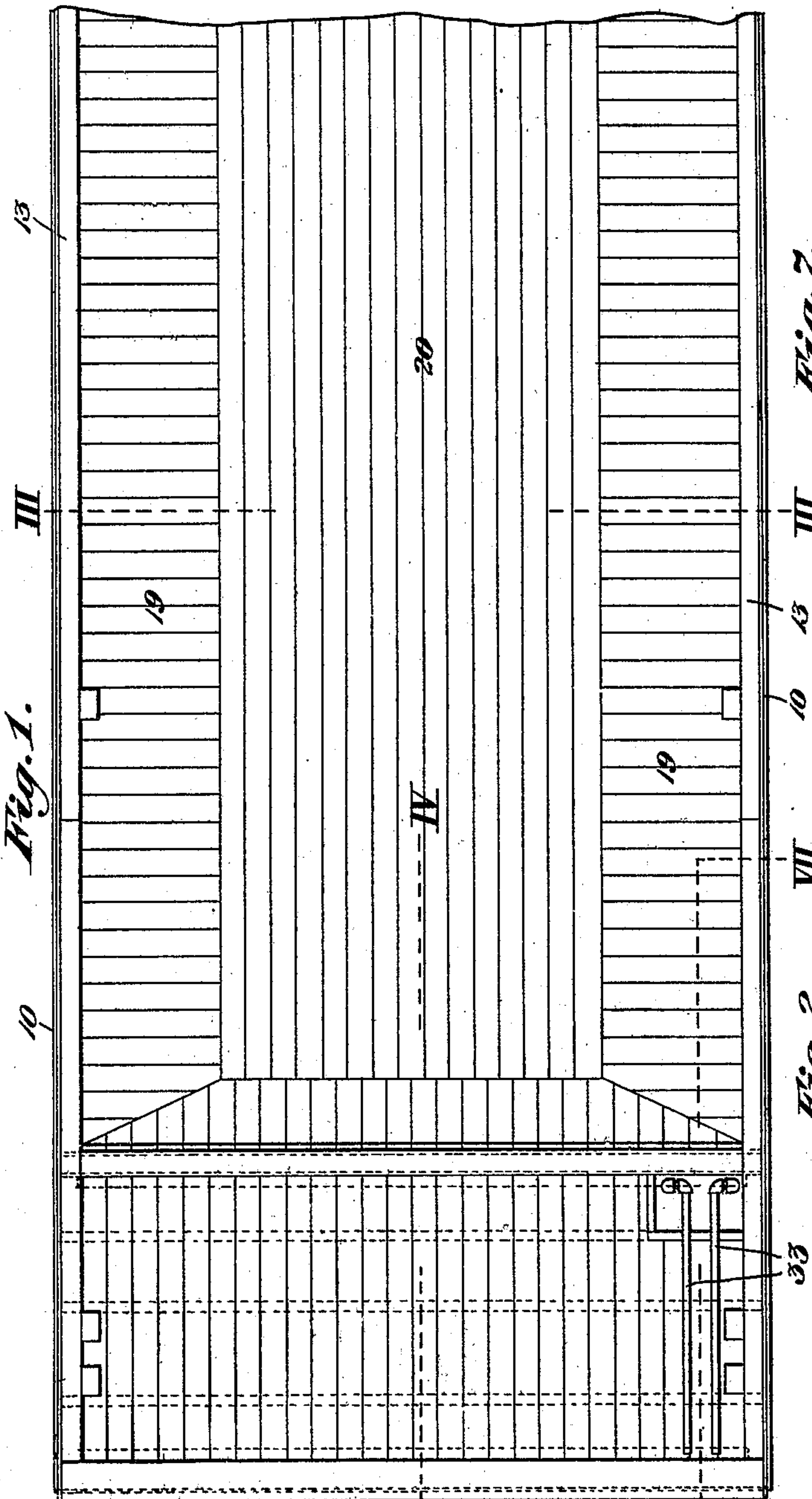
BARGE.

APPLICATION FILED NOV. 29, 1907.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 1.

915,410.



Witnesses:
Chas. S. Lyley.
Ralph B. Shawkey.

Fig. 7.

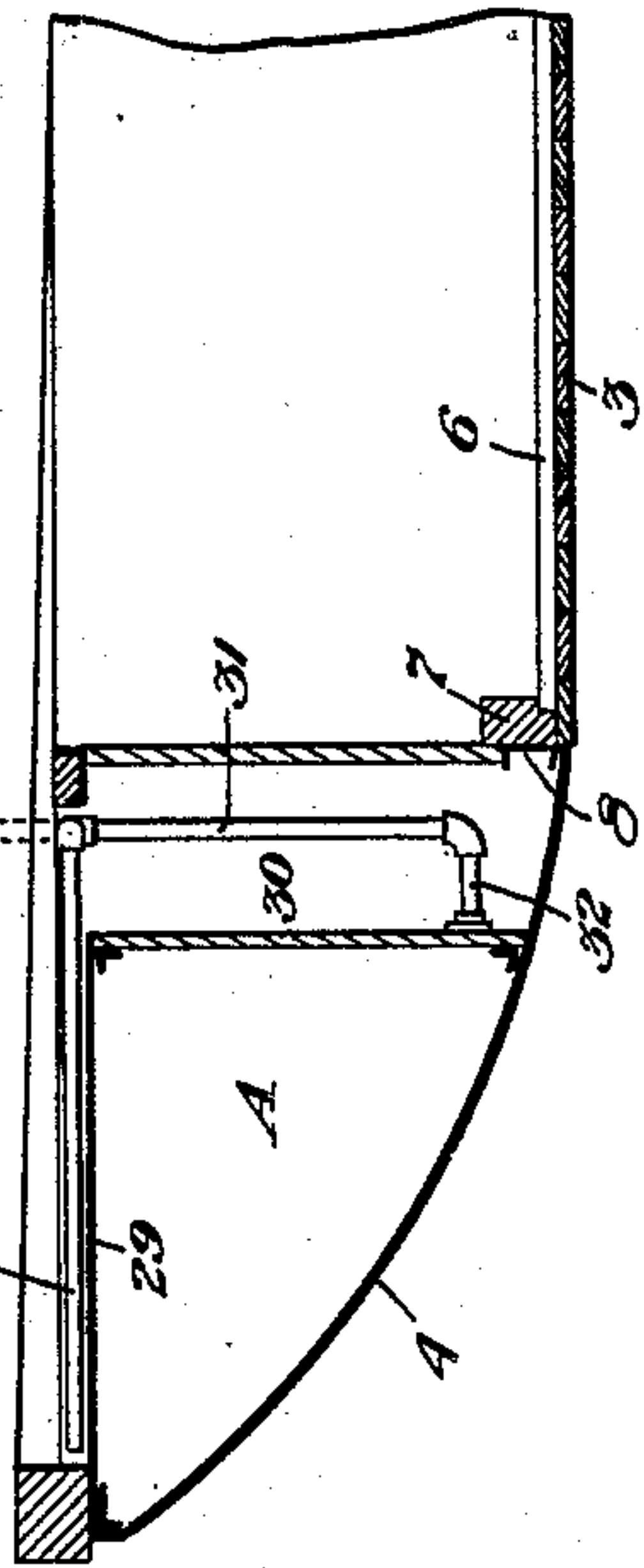
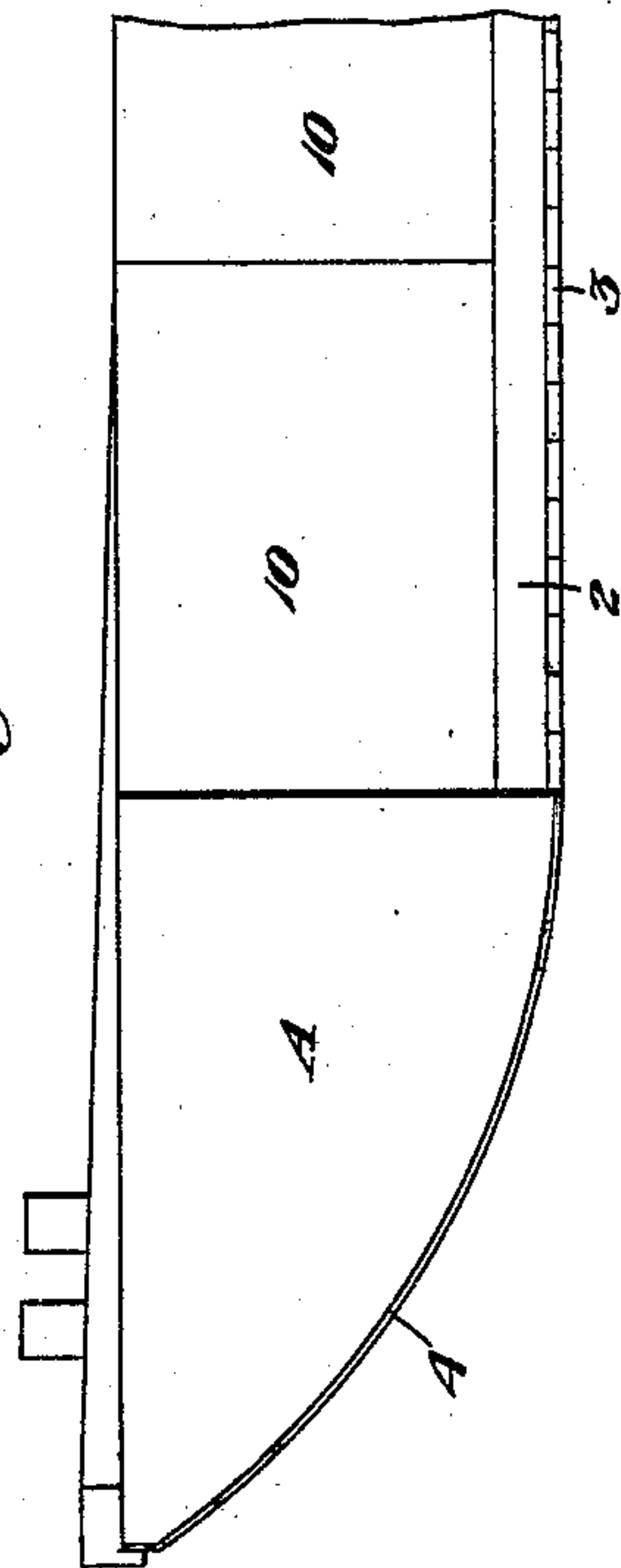


Fig. 2.



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Fig. 3.

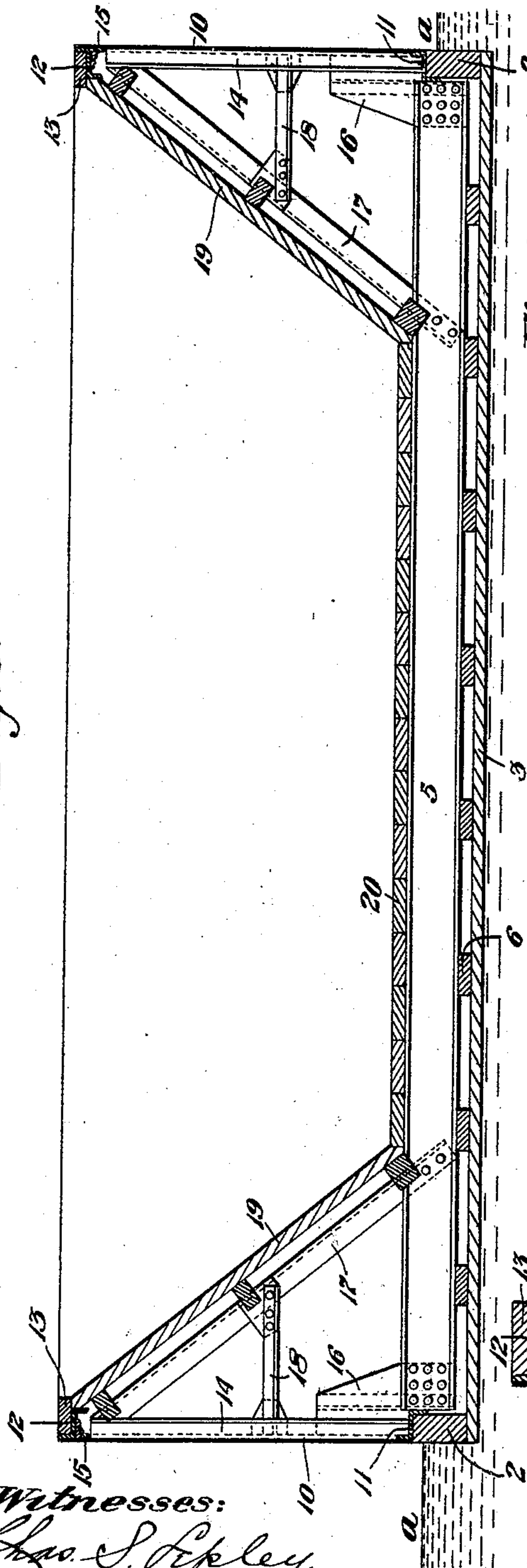


Fig. 4.

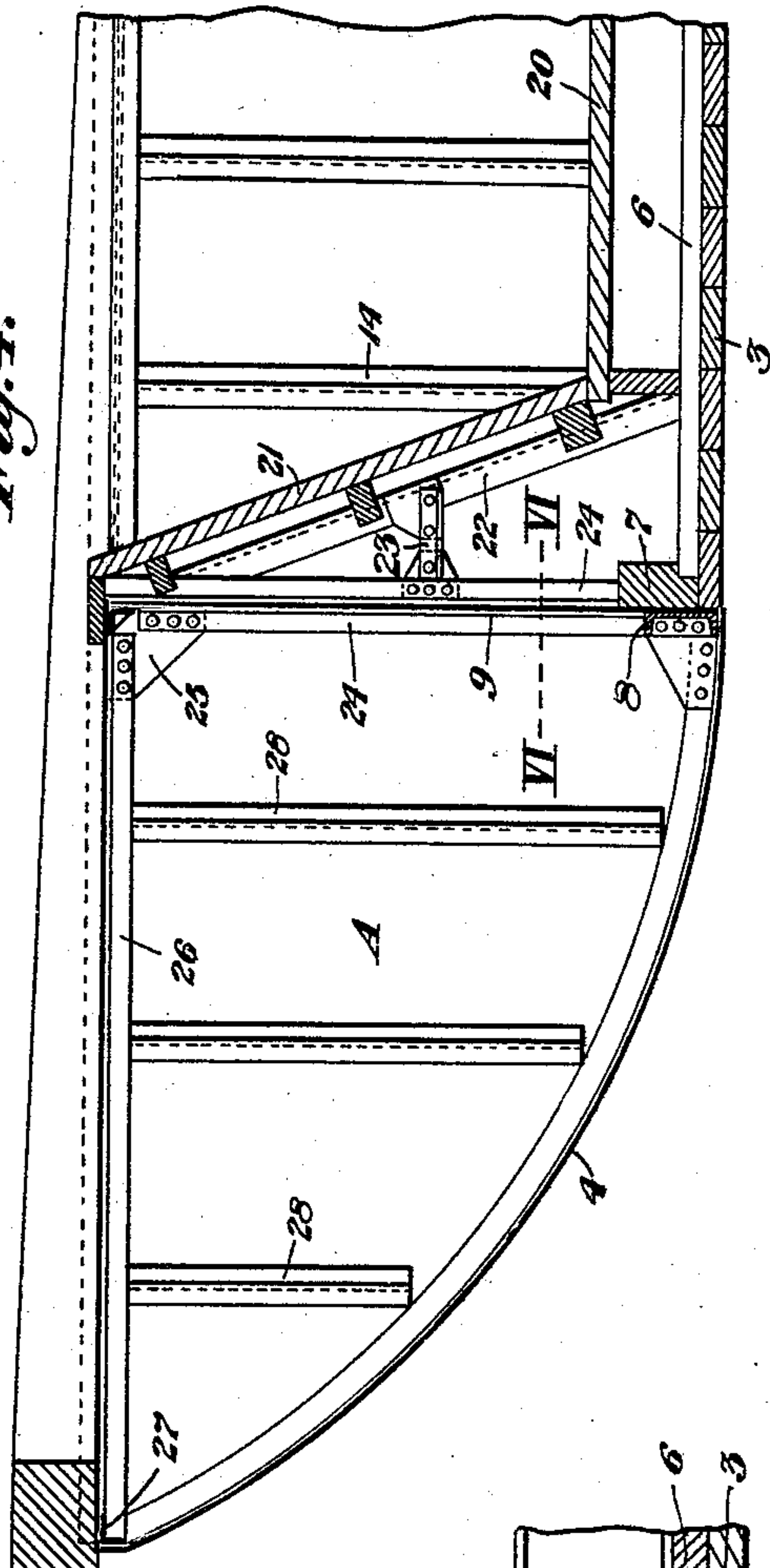


Fig. 5.

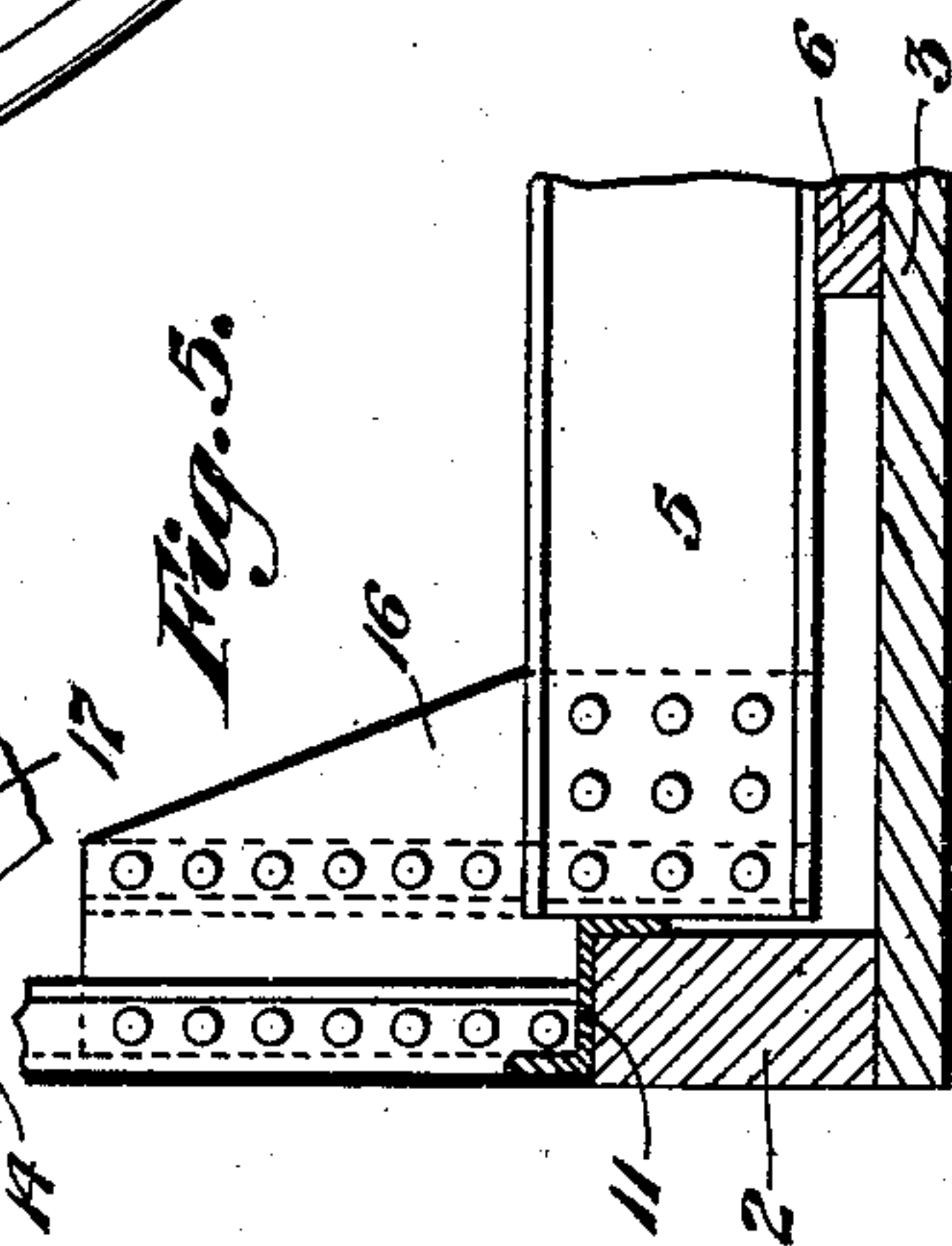
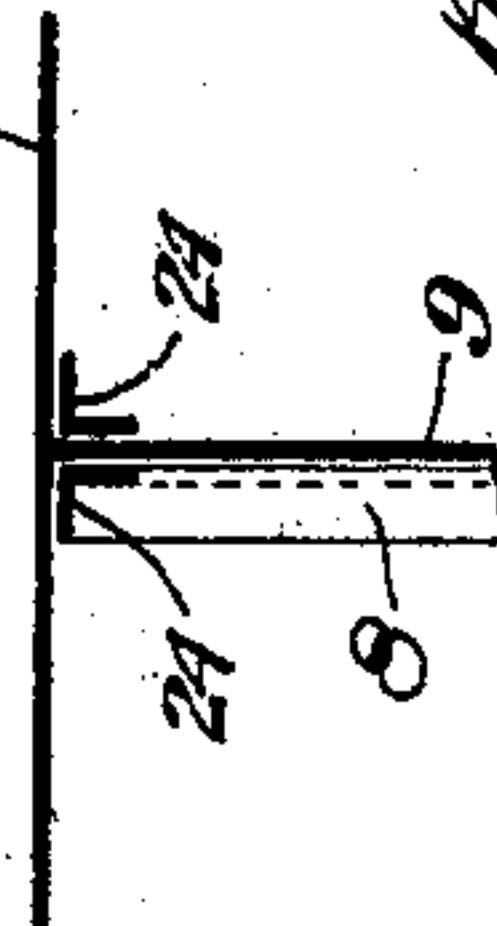


Fig. 6.



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UNITED STATES PATENT OFFICE.

ARTHUR M. BOWMAN, OF AVALON, PENNSYLVANIA.

BARGE.

No. 915,410.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed November 29, 1907. Serial No. 404,223.

To all whom it may concern:

Be it known that I, ARTHUR M. BOWMAN, a citizen of the United States, residing at Avalon, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Barges, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in barges for transportation of coal, sand, or other commodities in bulk and refers particularly to certain features of improvement as hereinafter described whereby the metallic portions of the barge are, when empty, above the water line; an improved construction providing water-tight compartments at each end, and to the combination with a wooden bottom of a metallic or part-metallic superstructure, constructed in the manner hereinafter described.

Referring to the drawings: Figure 1 is a plan view of one end of the barge. Fig. 2 is an elevation of a similar portion of the barge constructed in accordance with my invention. Fig. 3 is a transverse sectional view on an enlarged scale, indicated by the line III, III, of Fig. 1. Fig. 4 is an enlarged longitudinal sectional view on the line IV, IV, of Fig. 1. Fig. 5 is a detail view, on a further enlarged scale, illustrating the construction in transverse section similar to Fig. 3. Fig. 6 is a detail view on the line VI, VI, of Fig. 4. Fig. 7 is a sectional view on the line VII, VII, of Fig. 1, showing the means for emptying the sealed chamber.

Generally stated the invention consists of the combination with a wooden bottom, of superimposed sides and ends of sheet, plate, or structural metal, so constructed and combined with the bottom as to reinforce the entire structure at the points of greatest strain, and whereby the metallic superstructure is normally above the water line when the barge is empty, together with other features of improvement as above noted and as shall be hereinafter more fully described.

In my invention I have utilized the structural strength incidental to girder construction which I have employed for the sides of the vessel so as to overcome breaking or other strains arising in service and under various distributions of the load, together with means for bracing the sides laterally. The

sides are composed of a suitable girder framework similar to my prior patent No. 819633 and are covered with plates adapted to resist the wear and impact of service and to overcome the horizontal shear and the relative movement of the planking and wear of the drift bolts in their holes at the points of strain incident to wooden constructions.

The under or sub-structure, with which my improved superstructure is combined, consists of a bottom having wooden sides or gunwale members 2, 2, of sufficient depth to buoyantly project upwardly above the water line *a, a*, when the barge is empty, provided with a bottom 3, of planking for the flat middle portion of the barge from end to end, terminating in upwardly curving end sections 4, of sheet metal, forming continuations of the bottom 3.

5 represents the transverse floor-supporting beams, preferably of structural iron or steel, having upper and lower flanges, and may be of channel, I-beam or other suitable form, between which and the flooring are interposed a series of longitudinal stringers 6, preferably of wood.

7 represents end cross beams located above the planking 3 transversely of the barge at each end of the flat bottom, beyond which are channels 8 or other suitable flanged structural elements. Between the beam 7 and channel 8 is a vertically arranged plate 9 constituting a partition member extending from the bottom to the top of the barge and forming one wall of the water-tight compartment or sealed chamber A at each end. The partition 9 may also be made of wooden planking if desired. The sides of the barge above the side or gunwale members 2 are composed of plates 10 extending from said wall up to the upper edge at each side, secured by riveting at the bottom to a Z-bar or other suitable section 11, and at the top to a similar Z-bar or other element 12 forming the top gunwale member of the vessel and preferably provided with a walk-plank 13. Vertical stud members 14 of Z-bars or other suitable flanged elements, are incorporated with the structure inside of side plates 10, set at the bottom upon Z-bars 11 and connected at the top with longitudinally extending angles 15, also joined to Z-bars 12.

The transverse floor beams 5 are connected with the vertical studding members 14 by

gusset plates 16, the parts being riveted together as clearly shown, while angularly arranged braces 17 of angle or other suitable form extend upwardly and outwardly from each of beams 5 and are likewise connected with stud members 14 at their tops and by lateral braces 18 with the middle portion of the studs 14 and also to the sides as clearly shown in Fig. 3.

By this construction I provide against lateral strains and insure a rigid unyielding framing, and incidentally provide sloping side braces upon which the inner sloping sides 19 of planking may be laid, which are joined with the bottom planking 20 at each side. Likewise, the ends of the interior cavity of the barge are preferably closed by upwardly and outwardly sloping end planking 21 laid against correspondingly arranged braces 22 connected at the top and bottom with the other portions of the structure and at the middle by the intervening bracing members 23, as clearly shown in Fig. 4. The object of such construction as to the bottom, sides and ends is that the barge may be easily emptied by buckets or other suitable means, while the whole capacity of the barge is not materially reduced.

In Fig. 7 I have shown the chamber A as air-tight, for which purpose it is decked over by planking or plates 29 making tight closure with the sides, bottom and the transverse partition. 30 is a pump well, downwardly through which extends one or more pipes 31, preferably two, having a connection 32, with the interior of the chamber A as shown, and preferably suitably packed to insure a water-tight joint. At their upper ends pipes 31 are connected by ordinary elbow or other suitable couplings with movable sections 33 adapted to lie normally along the top of the deck or to be raised as indicated in dotted lines, (Fig. 7) when the vessel is sunk below the surface of the water. By this means any suitable connection may be made with pumping, siphoning, or other air or water-forcing or exhausting mechanism to empty the chamber A of water and fill it with air, to assist in raising the barge. Each end of the barge above the water-tight compartment or sealed chamber A may be decked over by plates or left open as desired, but I prefer to completely close the chamber within the air-tight walls to secure the advantages of buoyancy and capability of raising the vessel when sunk, as hereinafter described.

The transverse partition plate 9 is secured to the side plates 10 by means of the vertical angle braces 24, 24, connected at the bottom with transverse channel 8 and at the tops by gusset plates 25 with upper corner angle braces 26 extending outwardly toward each end and joined with the upper terminals of curved bottoms 4 by angles 27, while vertical

stud braces 28 of Z-bar or other flanged form may be used at intervals to brace the sides of the ends as in Fig. 4.

The barge, when made in the manner shown, provides a superstructure of great rigidity and strength, stiffening the vessel against the various strains to which it is subjected, and is composed of material which is sufficiently light to be ordinarily maintained above the water level *a, a*, by the wooden bottom.

An especial advantage of the planking and other wooden portions of the bottom is that it may be constructed at any point where timber or lumber is available and then floated to the point of erection of the superstructure; the wooden portions may be readily and quickly renewed at small expense, and being constantly submerged are not subject to decay, while the main metallic body portion of the barge is normally above the water, avoiding corrosion and is practically indestructible by ordinary wear or lapse of time.

It will be understood that the merits of the invention do not particularly depend upon the specific construction, size, design or particular elements employed, but that these features may be changed or varied within permissible limits by the designing builder or skilled mechanic, and all such changes are to be considered as within the scope of the following claims.

What I claim is:—

1. In a barge, the combination of a wooden bottom having partly submerged sides, bottom planking, inner transverse metallic beams, metallic sides projecting above the wooden sides, inwardly extending side-bracing elements connected with the metallic sides and upwardly rounded end bottom plates, substantially as set forth.

2. In a barge, the combination of a wooden bottom having partly submerged sides, bottom planking, inner transverse metallic beams, metallic sides projecting above the wooden sides, inwardly extending side-bracing elements connected with the metallic sides, upwardly rounded end plates, and intervening transverse partitions, substantially as set forth.

3. In a barge, the combination of a wooden bottom composed of side and end timbers and floor planking, metallic sides composed of plates extending upwardly above said side timbers and beyond the end timbers at each end, transverse partition plates and structural reinforcing elements laid against the end timbers and connected with said side plates, upwardly and forwardly curving bottom plates connected with the side plates and said structural elements and forming continuations of the bottom planking, and cover plates extending between the sides and over the area within

said end portions beyond the partition plates whereby to provide water-tight compartments at each end of the vessel, substantially as set forth.

5 4. In a barge, the combination of a wooden bottom composed of side and end timbers and floor planking, metallic sides composed of plates extending upwardly above said side timbers and beyond the end
10 timbers at each end, transverse partition plates and structural reinforcing elements laid against the end timbers and connected with said side plates, upwardly and forwardly curving bottom plates connected with the
15 side plates and said structural elements and forming continuations of the bottom planking, and cover plates extending between the sides and over the area within said end portions beyond the partition plates, with
20 vertically arranged structural stud members and upper gunwale chord members incorporated with the side plates, said end sections providing water-tight compartments at each end of the vessel, substan-
25 tially as set forth.

5 5. In a barge having wooden sides and a bottom, the combination with the lower sides, of structural members laid longitudinally thereon, vertical stud braces having
30 inner and outer flanges, an upper gunwale Z-bar member, inner bracing members connected with the middle portion of said studs, and outer side plates secured on said struc-

tural members, stud braces, and gunwale members and forming continuations of the 35 lower wooden sides, substantially as set forth.

6. A barge provided with an air-tight chamber and an adjacent pump well, and a pipe communicating with the chamber 40 through said pump well and having a hinge joint, for the purpose described.

7. A barge provided with an air-tight chamber at each end and pump wells adjacent to said chambers, with pipes communi- 45 cating with the chamber through the pump wells and provided with hinged outer sections arranged to lie normally on the deck or to be raised vertically, for the purpose described. 50

8. In a barge, the combination of a wooden bottom provided with longitudinal chord members, structural members laid longitudinally thereon, top chords consisting of longitudinal structural members and 55 wooden walk-planks, vertically arranged stud members, connecting the lower and upper chord members, and outer side plates laid over the chord and stud members, substantially as set forth. 60

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

ARTHUR M. BOWMAN.

Witnesses:

C. M. CLARKE,

CHAS. L. ALEXANDER.