

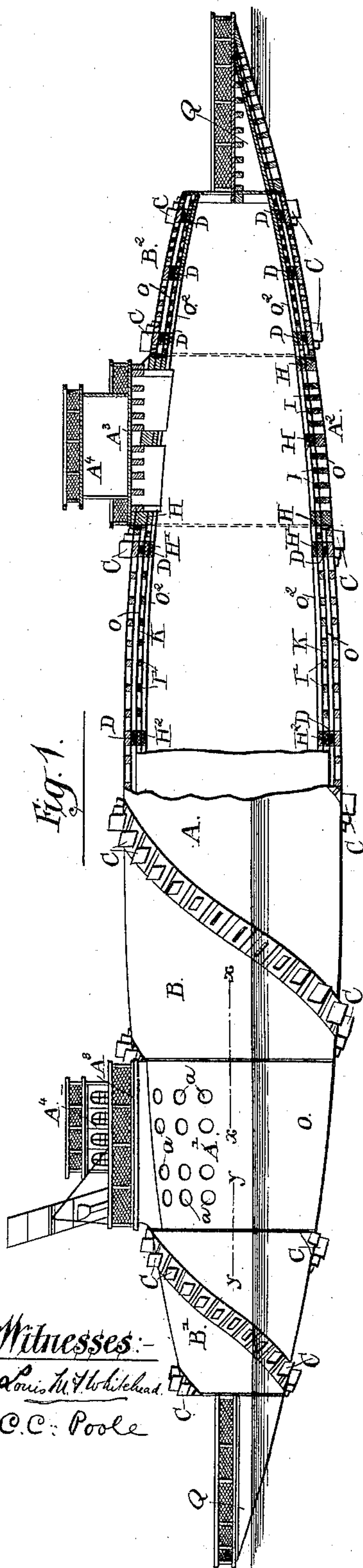
(No Model.)

C. M. CATLIN.

## CONSTRUCTION OF VESSELS.

No. 344,622.

Patented June 29, 1886.



101

*Witnesses:-*

Louis M. Whitehead.

C.C. Poole

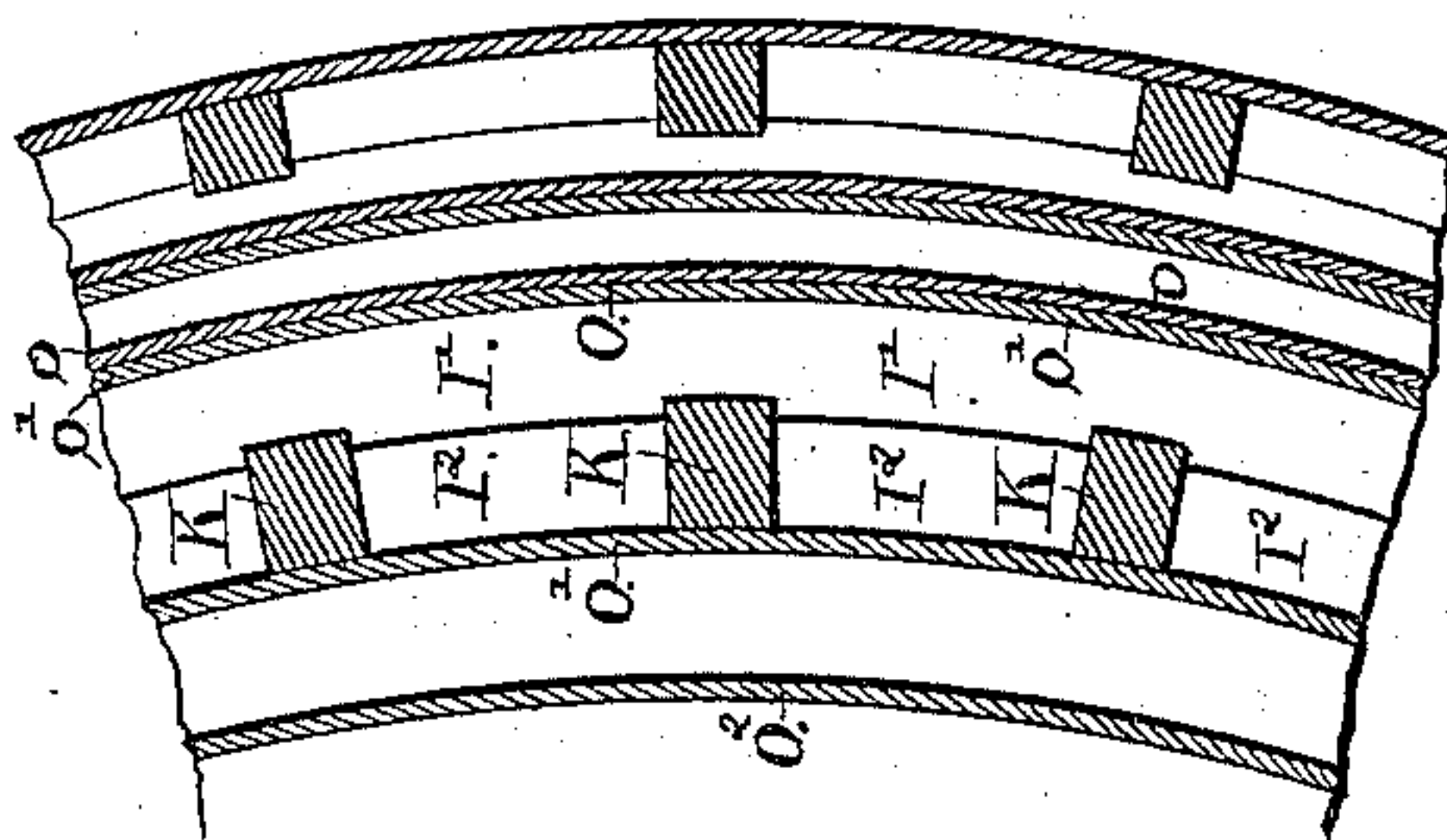
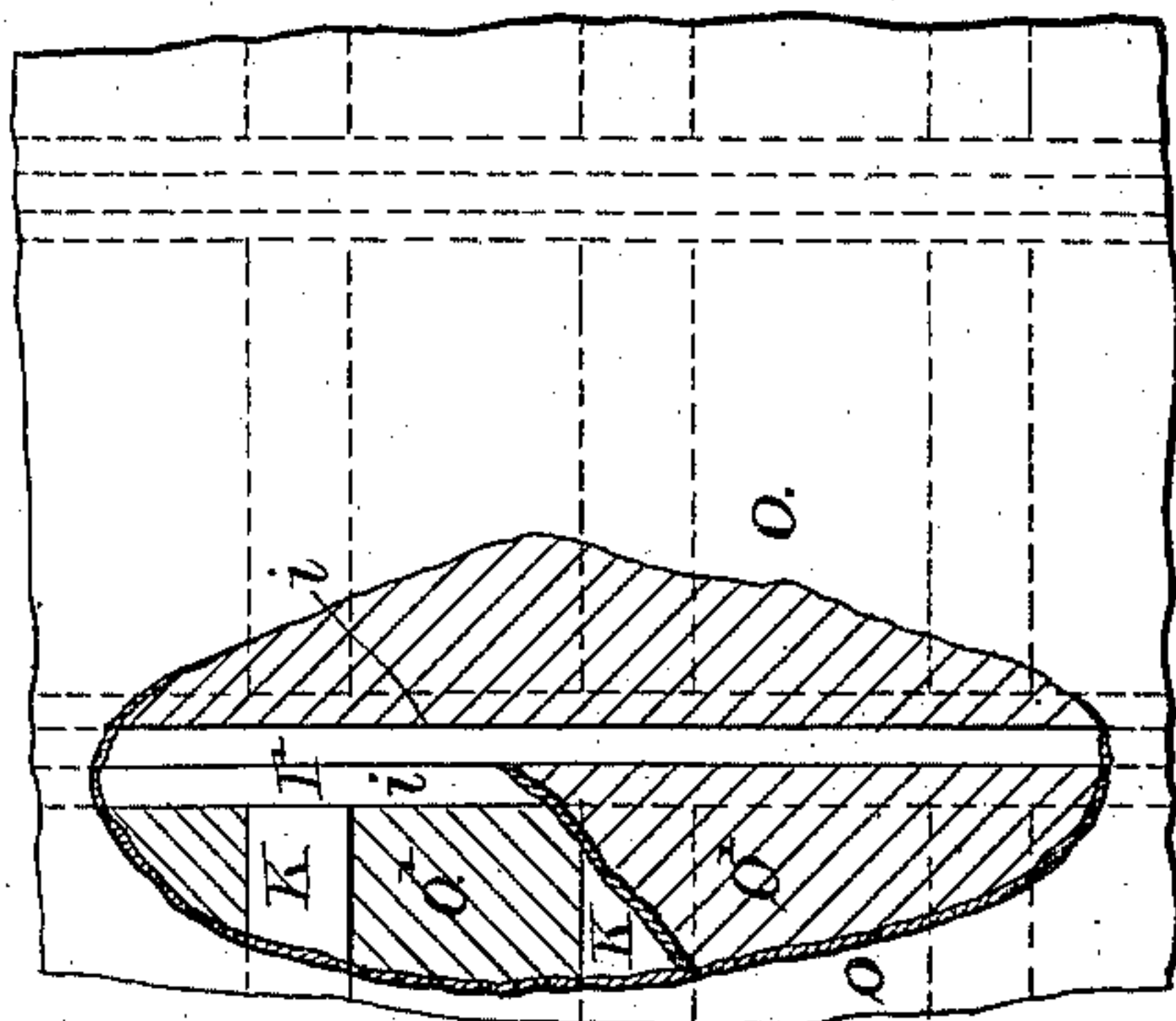


Fig. 2.

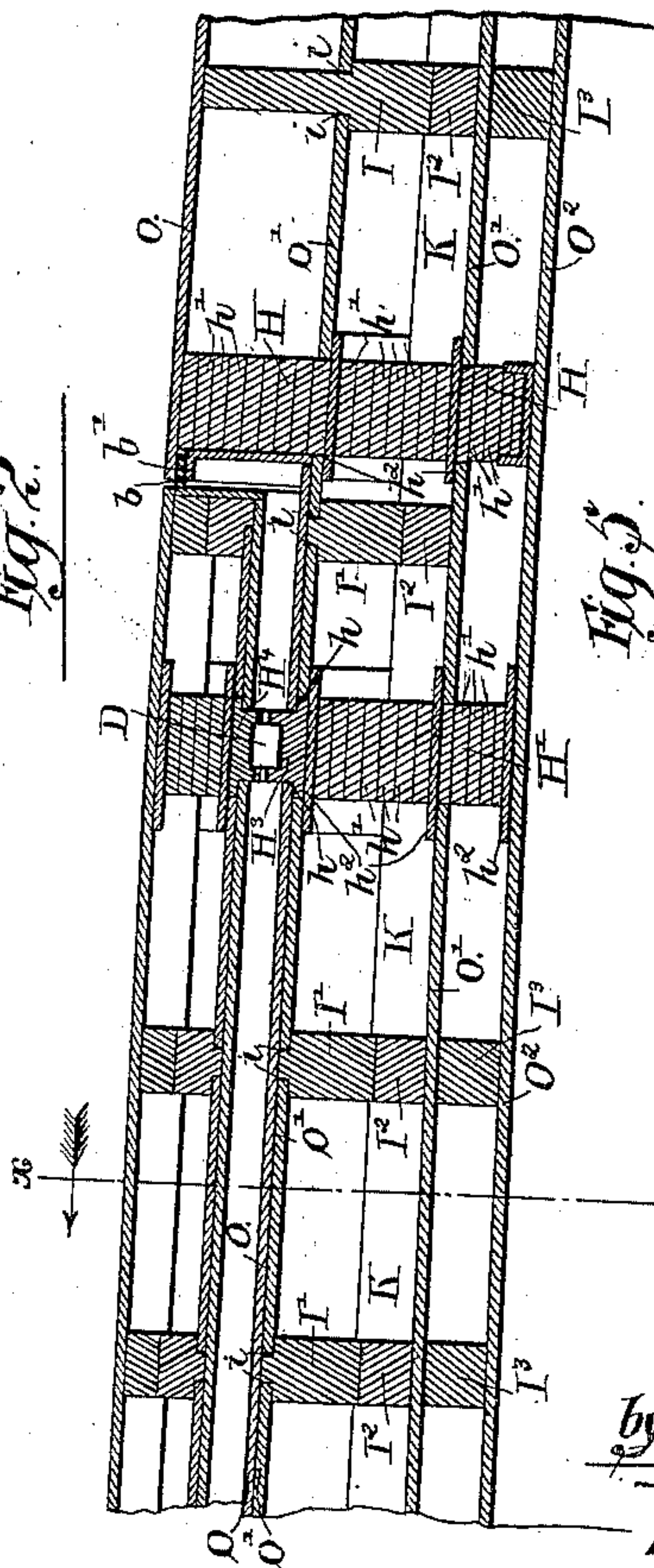
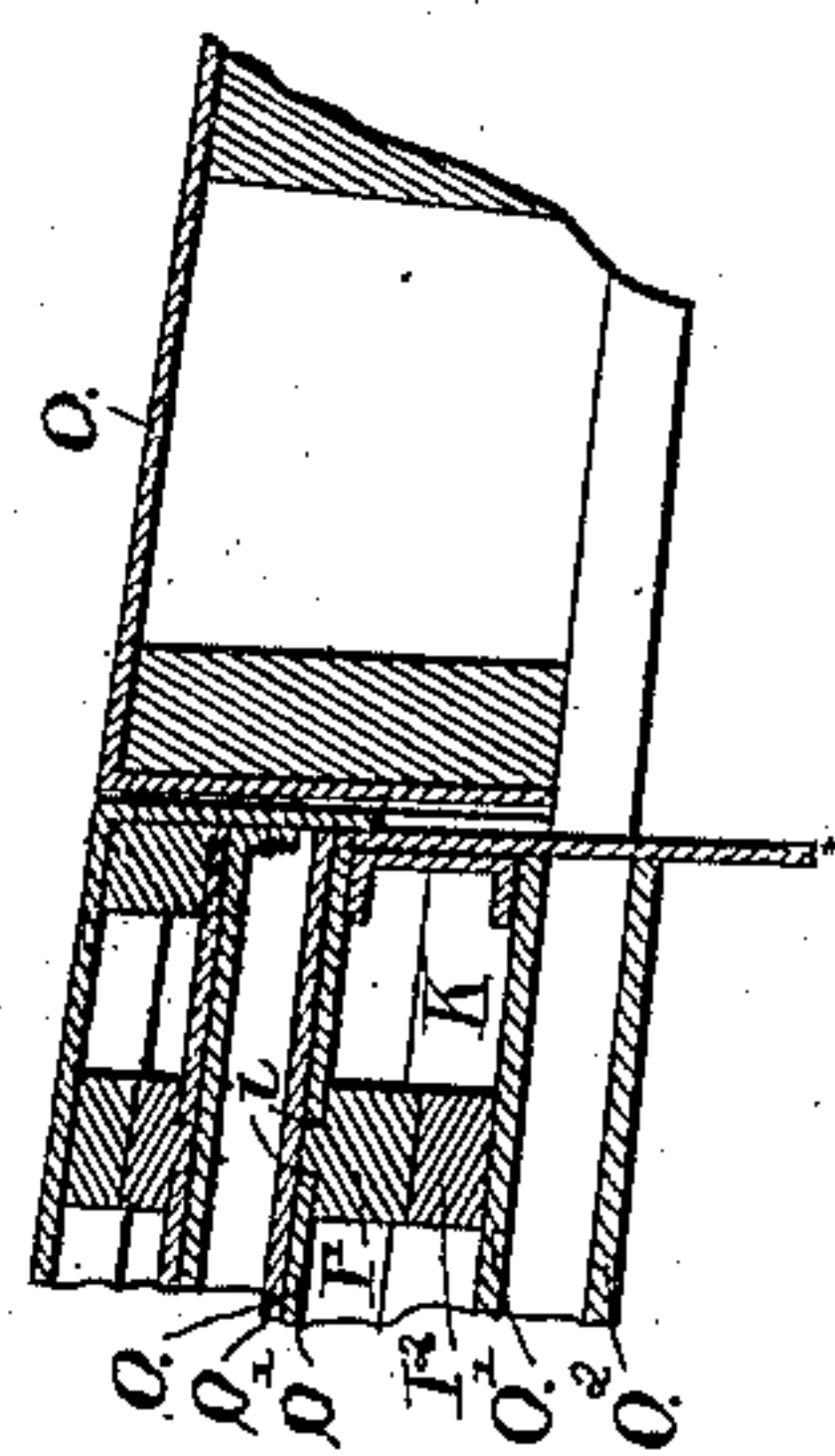


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## CONSTRUCTION OF VESSELS.

SPECIFICATION forming part of Letters Patent No. 344,622, dated June 29, 1886.

Application filed December 14, 1885. Serial No. 185,543. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES M. CATLIN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in the Construction of Vessels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide an improved construction in the hulls of vessels; and it consists in the matters hereinafter described, and pointed out in the appended claims.

The vessel herein illustrated as embodying my invention is circular in cross-sectional form, and is provided with a propelling-gear consisting of three revolving annular shells or cylinders placed about the exterior of the circular hull, provided with propelling-blades upon their outer surfaces, such as is shown, for instance, in a prior application, Serial No. 173,818, for Letters Patent of the United States filed by me upon the 7th day of August, 1885. As far as the features of construction in the hull herein shown and claimed are concerned, however, the hull may be of other shape, and any other propelling mechanism may be employed, as found desirable or convenient.

The invention may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side view of a vessel constructed in accordance with my invention, a portion thereof being shown in central section, to illustrate features of construction in the hull. Fig. 2 is an enlarged detail section through the part of the hull taken upon line  $xx$  of Fig. 1. Fig. 3 is a detail section of parts shown in Fig. 2, taken upon line  $xx$  of said figure. Fig. 4 is an enlarged detail view illustrating the construction of the several layers of material composing the hull. Fig. 5 is an enlarged detail cross-section of a part of the hull, taken upon line  $yy$  of Fig. 1.

In the particular embodiment of my invention herein illustrated, A indicates the main portion or hull of a vessel, which is in its general form circular in cross-section, and tapered

from its middle toward its ends, and B B' B<sup>2</sup> are tubular revolving shells, also circular in cross-section, and placed around the body of the vessel, said shells being provided upon their outer surfaces with inclined propeller-blades C. The said shells are constructed to rest upon anti-friction rollers D, located between the outer surface of the hull and the inner surface of the shells, with their axes generally parallel with the central longitudinal axis of the hull, and said shells may be actuated by suitable driving-gear constructed as shown in the said prior patent, or otherwise, as found convenient or desirable. The revolving shell B extends over the middle part of the hull, and the shells B' B<sup>2</sup> are located adjacent to the bow and stern, the uncovered spaces or zones A' A<sup>2</sup> being left between the ends of the shells B B' B<sup>2</sup> at which the hull itself is exposed, and forms the outer surface of the vessel, the said parts A' A<sup>2</sup> being made flush with the outer surfaces of the tubular shells, and provided with windows  $a$ , and with horizontal decks A<sup>3</sup>, for supporting suitable pilot or deck houses, A<sup>4</sup>, as fully set forth in said prior application.

The frame-work or skeleton of the hull proper is formed by means of main circular or circumferential ribs or frame-pieces H H' H<sup>2</sup>, intermediate lighter circular ribs, I I', and longitudinal frame-timbers K, extending from end to end of the vessel, and attached to the ribs H H' H<sup>2</sup> and I I' at their points of intersection with the latter. The ribs H are herein shown as located in the parts A' A<sup>2</sup> of the hull which are not covered by the revolving shells B B' B<sup>2</sup>, and the ribs H' H<sup>2</sup> are located in the parts of the hull covered by the said shells. As herein shown, also, the ribs H' and H<sup>2</sup> form foundations or supports for trough-shaped iron bands or channel-beams H<sup>3</sup> H<sup>4</sup>, affording support for the rollers D. The intermediate ribs, I', are located in the parts of the hull beneath the revolving shell, between the main ribs H' H<sup>2</sup>, and the ribs I are placed in the parts A' A<sup>2</sup> of the hull, the said ribs I and the main ribs H in these parts of the hull being made considerably thicker diametrically than the ribs H', H<sup>2</sup>, and I', so as to bring the outer surface of the said parts A' A<sup>2</sup> flush with the outer surfaces of the several shells.



The shells B B' B<sup>2</sup> are herein shown as constructed, generally, in the same manner as the main part of the hull, and as fully set forth in the said prior application. The outer sheathing or skin, O, of the hull proper is attached to the ribs H H' H<sup>2</sup> and I I', the longitudinal timbers K being attached to the inner faces of the said several ribs and supporting a second innersheathing, O'. Filling-pieces I<sup>2</sup> are placed against the inner faces of the ribs I I' and between the longitudinal beams K, to form additional supports to the said inner sheathing, O', and to additionally stiffen the frame. The outer skin or sheathing is preferably made in two thicknesses or layers, o o', the outer thickness, o, being made of metal, and the inner thickness, o', of wood. The said inner layer, o', is composed of relatively short sheathing boards or planks placed at their ends in rabbets i, formed at the outer corner of the ribs I I', and arranged to abut against the side edges of the channel-beams H<sup>3</sup> H<sup>4</sup>, which latter are bolted or otherwise secured to the outer surface of the main ribs H' H<sup>2</sup>, the said sheathing boards or planks being arranged diagonally, as shown in Fig. 8, so as to brace the parts of the frame and prevent angular displacement therein. The inner sheathing, O', is also preferably laid diagonally, with the boards or planks thereof transverse to those of the layer o', the ends of the planks of said sheathing being arranged to abut against the sides of the main ribs H H' H<sup>2</sup>, whereby the entire frame is provided with two layers of inclined sheathing running in opposite directions, with obvious advantages in giving stiffness and rigidity thereto. The outer metallic layer, o, of the outer skin, O, is placed over the sheathing-planks of the layer O', and against the ribs I' in the parts of the latter which project outwardly between the rabbets i. The plates composing the outer layer of the skin are preferably lapped over and secured to marginal flanges h, formed upon the channel-irons H<sup>3</sup> H<sup>4</sup>, said flanges h being made of the same thickness as the sheathing O', to enable the plates of the outer skin to be laid flat over the said sheathing and flanges.

The main frame pieces or ribs H H' H<sup>2</sup> may be constructed in any familiar or suitable manner, said ribs, as herein shown, being made up of a series of layers, h', of bent wood, together with metal strips h<sup>2</sup>, which project at their edges beyond the sides of the wooden layers, so as to form flanges for the attachment of the sheathing or skin O' o'. The metal strips h<sup>2</sup> will usually extend continuously around the vessel, a portion of the layers in the wooden parts of the ribs being cut out or notched to permit the passage of the longitudinal beams K.

In the parts A' A<sup>2</sup> of the hull in which the ribs H and I are constructed to sustain the outer skin flush with the outside of the tubular shells, as before set forth, the inner sheathing, o', of the outer skin, O, is desirably continued at the same distance from the inner skin or sheathing, O', the outer layer, O, being in this case separate from the layer o', as

clearly shown in Fig. 2. The inner sheathing, O', is intended more especially as a means of bracing the frame, and to form water-tight compartments between the frame-pieces of the hull. A third layer or inner sheathing, O<sup>2</sup>, may, if desired, be laid in the lower part of the hull, upon the inner surfaces of the ribs H H' H<sup>2</sup>, supporting-pieces I<sup>2</sup> in such case being placed upon the ribs I I' to sustain said inner sheathing. The said inner sheathing, O<sup>2</sup>, when present, obviously prevents the direct contact of the load with the sheathing O', and forms a space to receive leakage or bilge water.

A practically water-tight joint is herein shown as formed between the hull and the ends of the shells by means of a flange, b, upon the shell, Fig. 2, which enters a groove formed by the marginal part of the outer metal sheathing and the cylindric flange b', attached to the rib H inside of the flange b, as fully set forth in the said prior application.

In the particular vessel herein shown the portions Q Q' of the bow and stern forward, and at the rear of the tubular shells B' B<sup>2</sup>, instead of being made in the same manner as the remainder of the hull, are of lighter construction, the ends of the main part of the hull being closed by transverse walls or bulk-heads, so that in case the said lighter end parts of the vessel become injured or detached by collision or otherwise the main part of the vessel will float, and its safety will not be endangered.

In the particular construction of the parts illustrated the several longitudinal timbers K of the hull terminate in a circular metal beam, I<sup>4</sup>, to which is attached a suitable wall or bulk-head, I<sup>5</sup>, supported internally by suitable transverse beams, I<sup>6</sup>, Figs. 1 and 5. The said wall or bulk-head is preferably arranged in the same plane with the end faces or edges of the tubular shells B' B<sup>2</sup>, and in order to prevent access of water to the space between the shells and hull at this point each shell is provided with an inwardly-projecting metal flange, b<sup>4</sup>, as clearly shown in Fig. 5.

The parts Q Q' of the hull may be constructed in any desired or preferred manner, said parts, as herein shown, being constructed with transverse ribs g and horizontal timbers q', and provided with flat decks Q<sup>2</sup>, and attached to the main part of the hull by extending the timbers q' through the bulk-head I<sup>5</sup> and securing them to the main ribs H' H<sup>2</sup>, adjacent to the bow and stern of the vessel. The bulk-heads I<sup>5</sup> are desirably provided with openings q<sup>2</sup>, whereby access may be had to the decks of the parts Q Q', said openings being provided with suitable doors or shutters, whereby they may be securely closed in case of necessity.

It is entirely obvious that the general features of construction herein shown and described may be applied to the hulls of vessels which are of other than circular form, and my invention, as set forth in the appended claims, is not therefore limited to any particular form in the vessel, but said claims are intended to cover the features of construction therein



set forth when said features of construction are applied to vessels of the form commonly used, as well as to vessels made circular, as herein shown, or otherwise.

5 The features of construction herein claimed are shown and described but not claimed in the prior application, Serial No. 173,818, hereinbefore mentioned.

I claim as my invention—

10 1. A vessel constructed with parallel ribs, as I, and longitudinal beams K, and having an outer skin, O, consisting of an inner layer, *o'*, of planks, held at their ends in rabbets in the outer faces of the ribs, and an outer layer, *o*,  
15 extending over the said planks and ribs, substantially as described.

2. A vessel constructed with parallel ribs, as I, and longitudinal beams K, and having an outer skin, O, comprising a layer, *o'*, of planks,  
20 placed diagonally with reference to the ribs, and an inner skin, O', consisting of planks, also laid diagonally with reference to the ribs, and arranged transversely to the planks of the layer *o'*, substantially as described.

25 3. A vessel constructed with parallel main ribs, as H, and intermediate ribs, as I, and longitudinal beams K, having an outer skin, O, comprising an inner layer, *o'*, of planks, arranged diagonally, and secured at their ends  
30 in rabbets in the outer surfaces of the intermediate ribs, and abutting against a part attached to the said main ribs, and an inner skin, O',

consisting of planks, also arranged diagonally and transverse to the planks of the layer *o'*, and constructed to abut against the said main ribs, substantially as described. 35

4. The combination, with the main part of a vessel tapered from its middle toward its ends, and terminating at a point short of the bow or stern with a transverse wall or bulk-head  
40 forming a closed end or ends to the said main part, of separate bow or stern parts, as Q or Q', attached to the said main part, substantially as described.

5. The combination, with the main part of a vessel tapered from its middle toward its ends, and terminating at points short of the bow or stern with a transverse wall or bulk-head forming a closed end or ends to the said main part,  
50 said main part being provided with main transverse ribs H' H' and suitable longitudinal timbers, of separate bow or stern parts, as Q Q', attached to the said main part by means of timbers *q'*, extending through the said bulk-head and secured to the said main ribs H' H',  
55 substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

CHARLES M. CATLIN.

Witnesses:

C. CLARENCE POOLE,  
M. E. DAYTON.