

(No Model.)

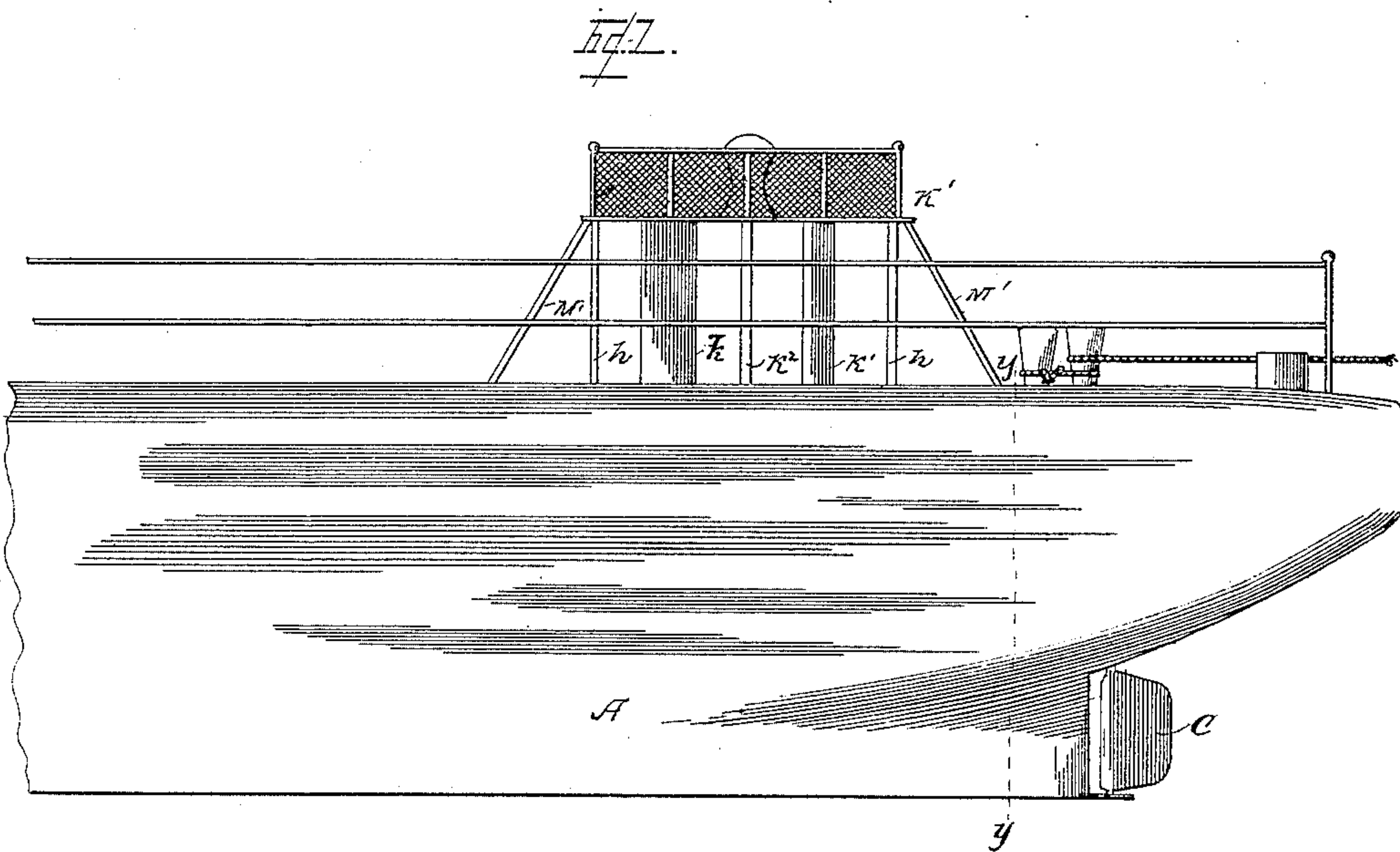
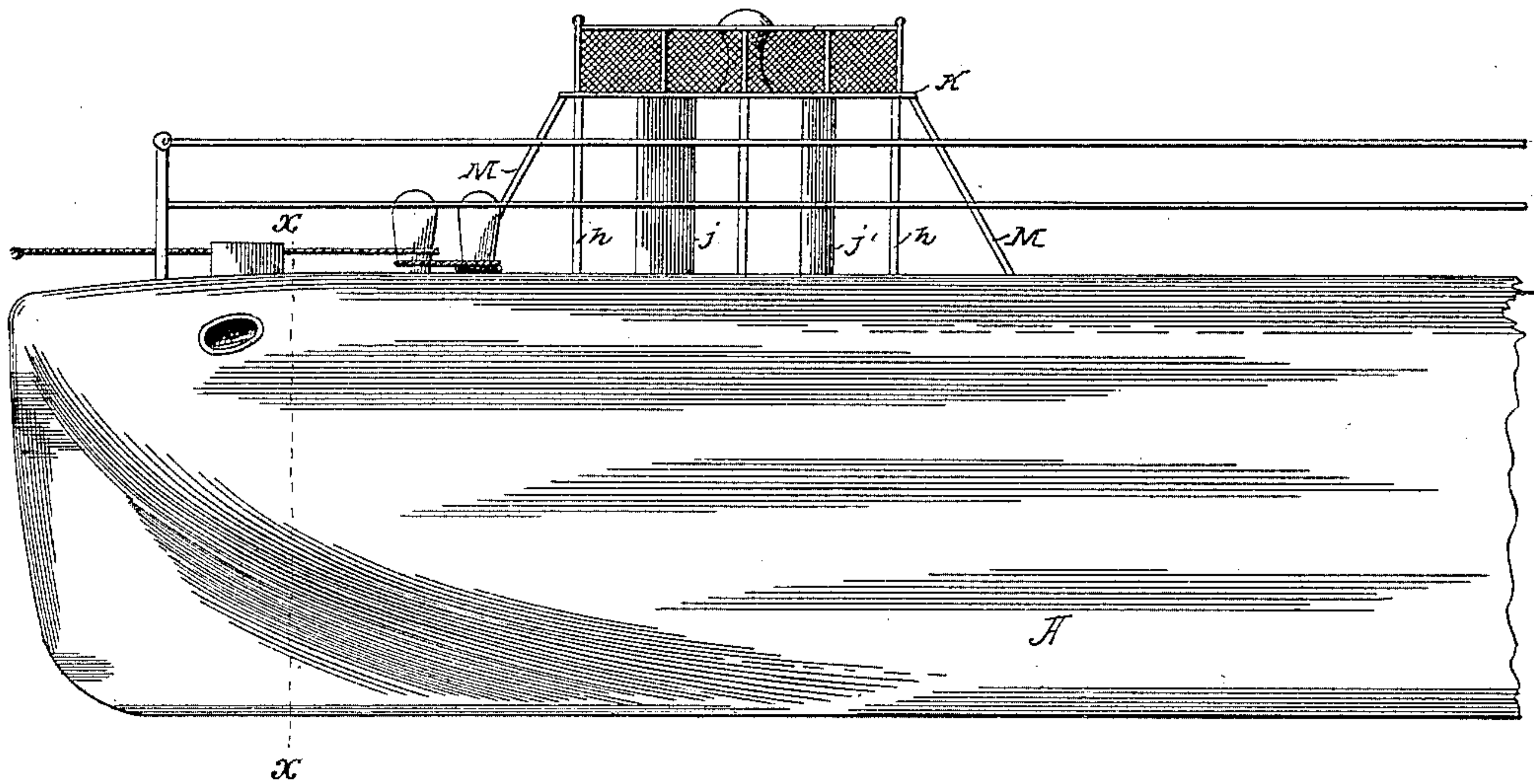
3 Sheets—Sheet 1.

A. McDOUGALL.

TOW BOAT.

No. 393,997.

Patented Dec. 4, 1888.



Witnesses.

*E. H. Perry.*

*S. B. Dyer.*

Inventor,  
Alexander McDougall,  
by Geo. W. Alger,

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Fig. 2.

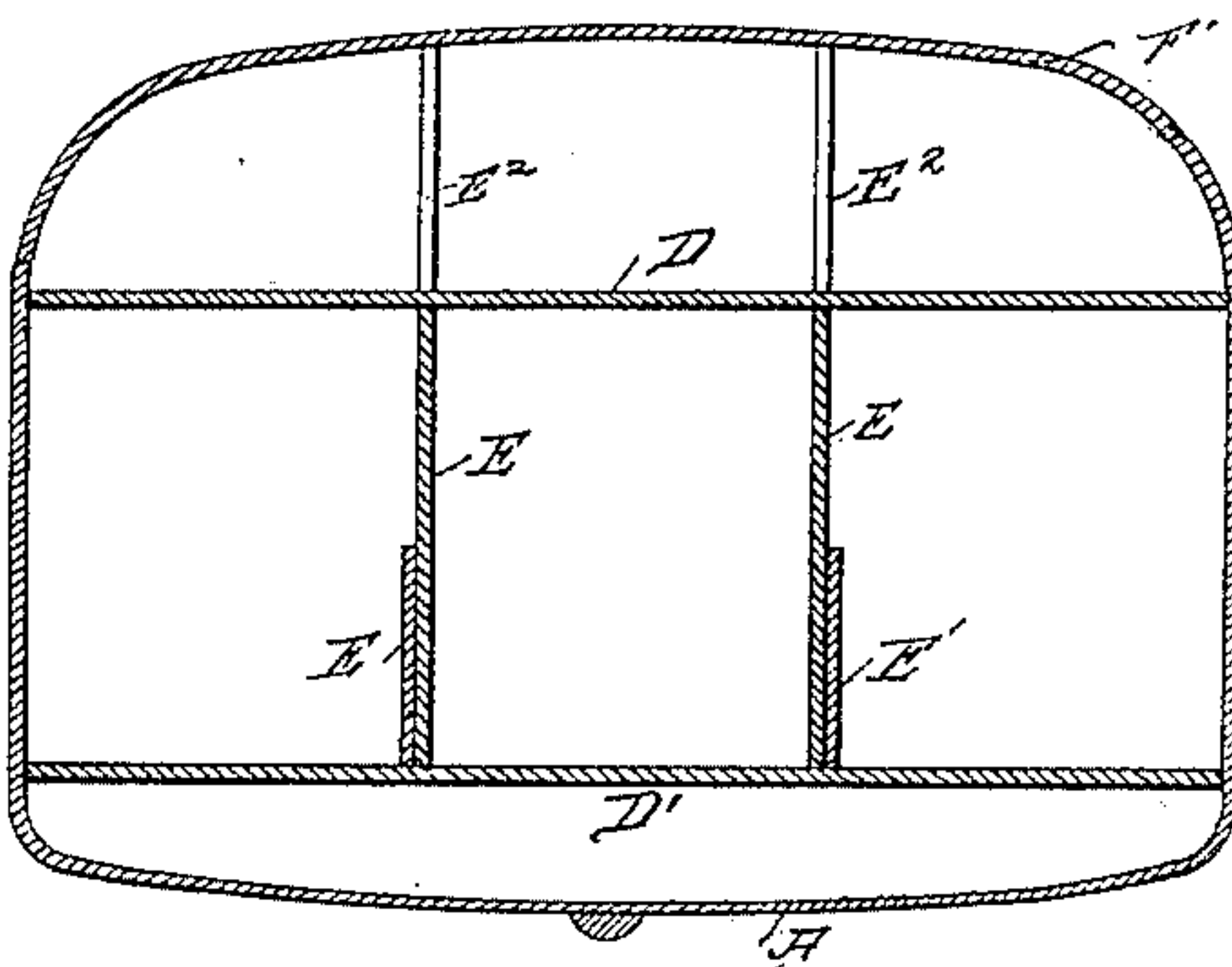


Fig. 3.

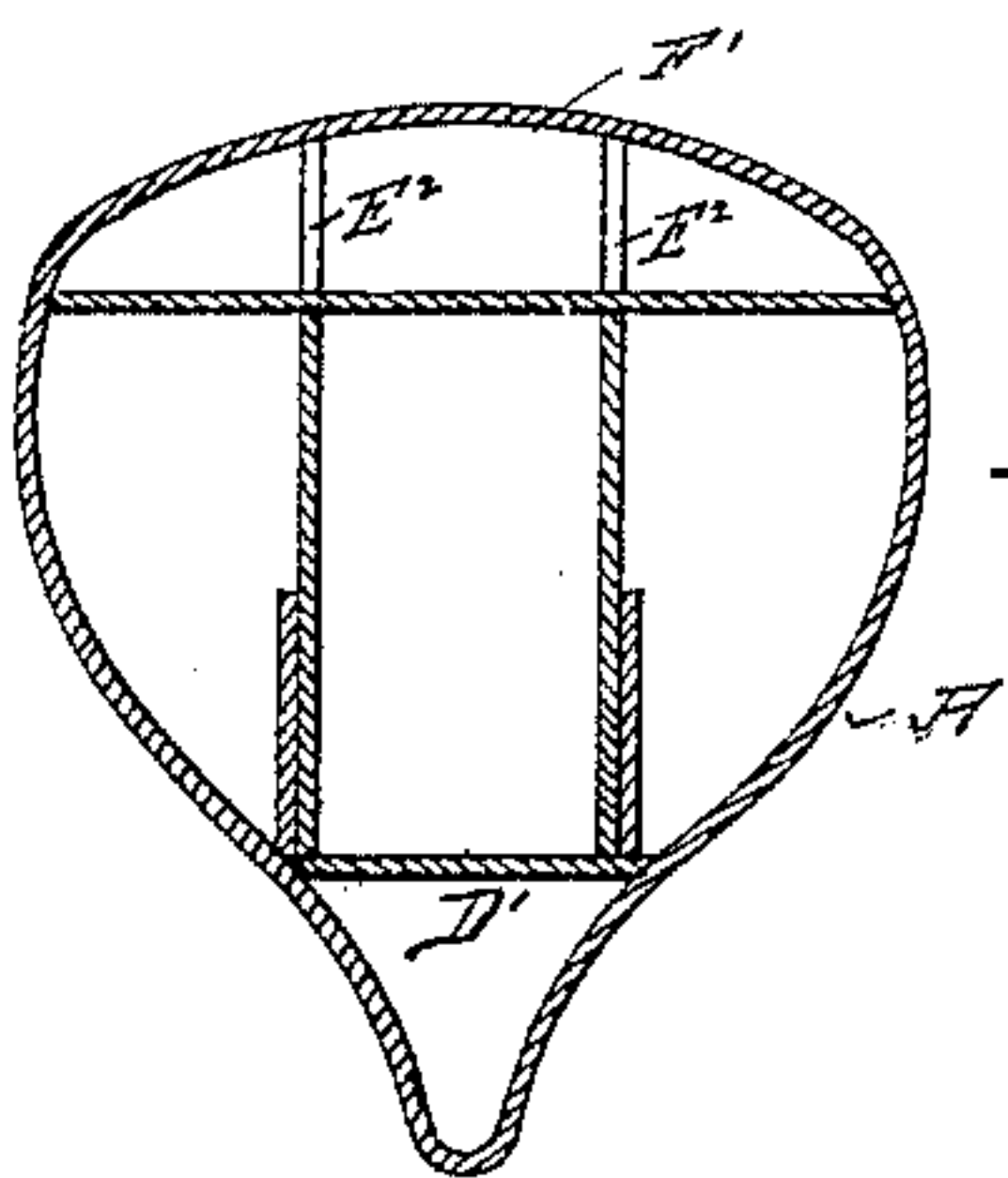


Fig. 4.

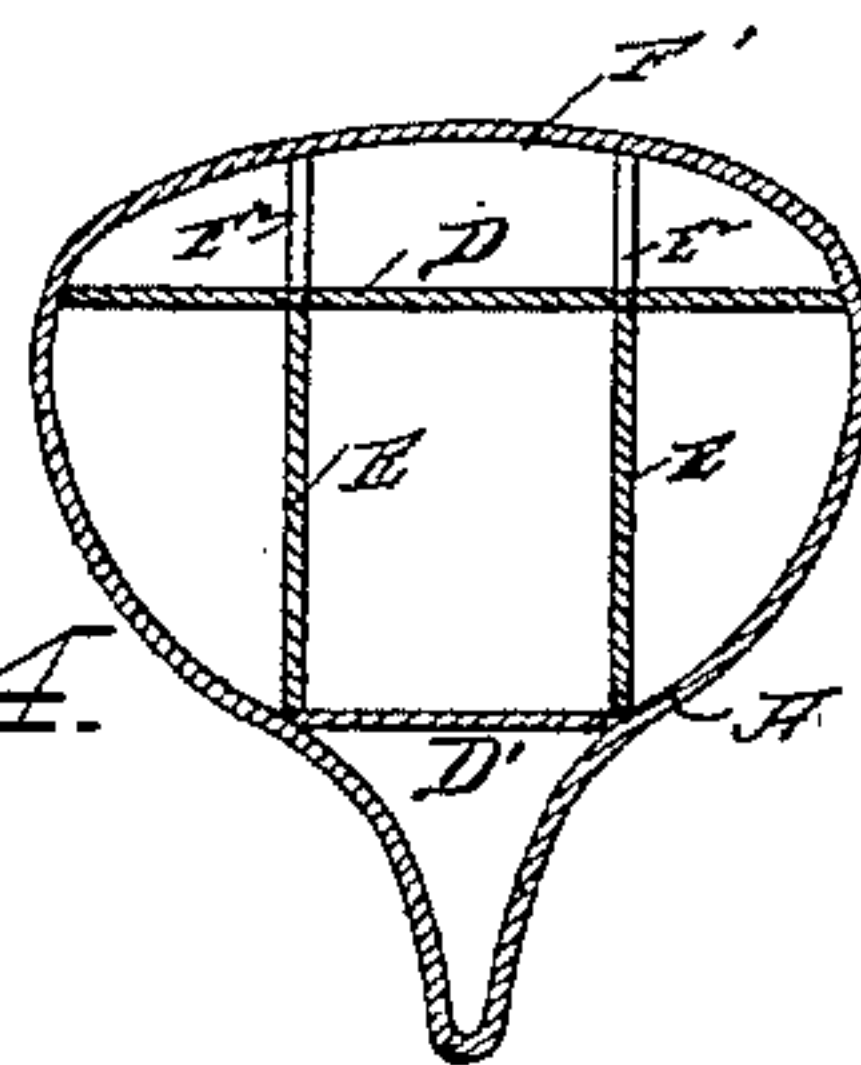
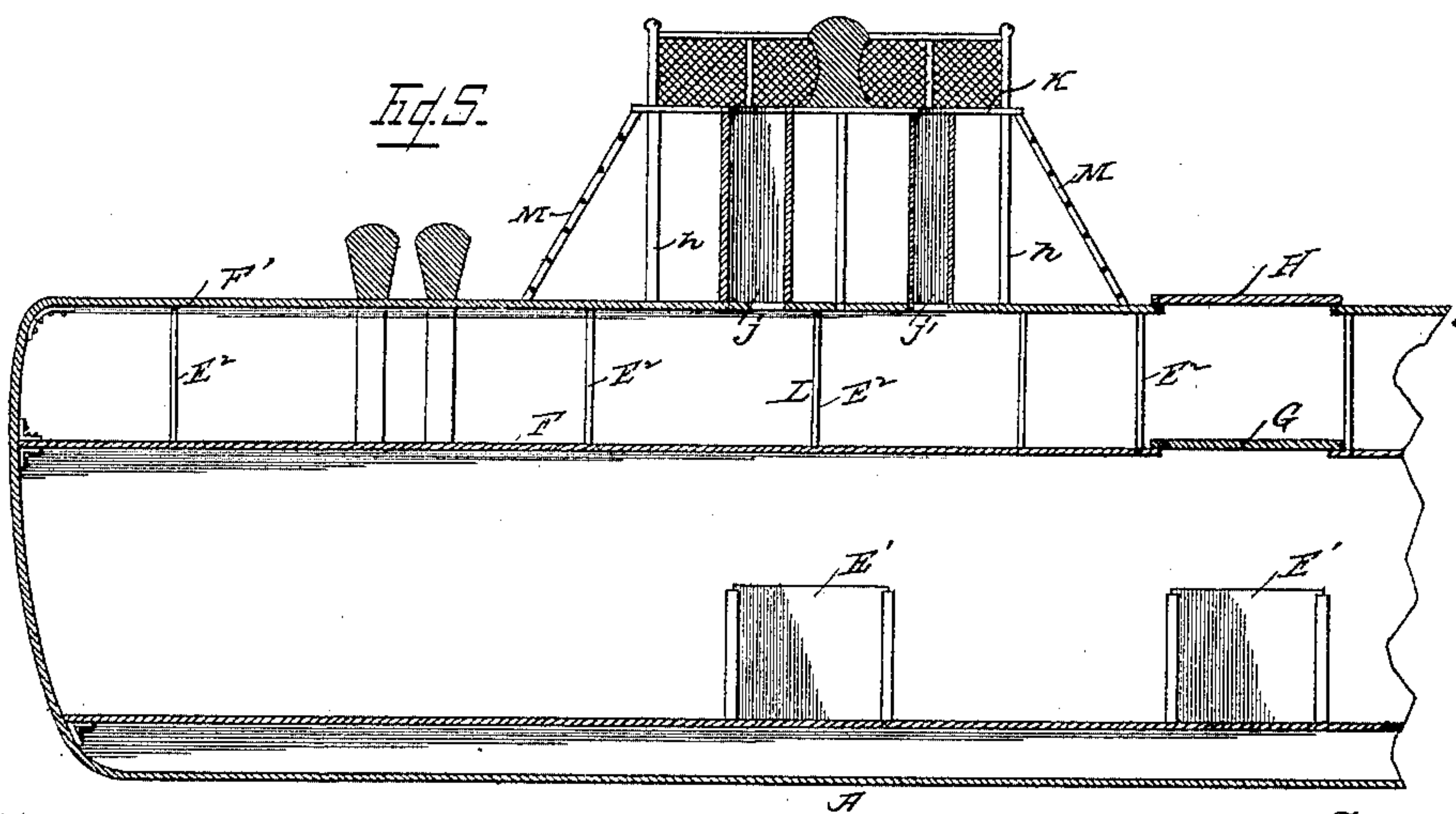


Fig. 5.



Witnesses.  
E. H. Berry.  
Frank Lewis, Jr.

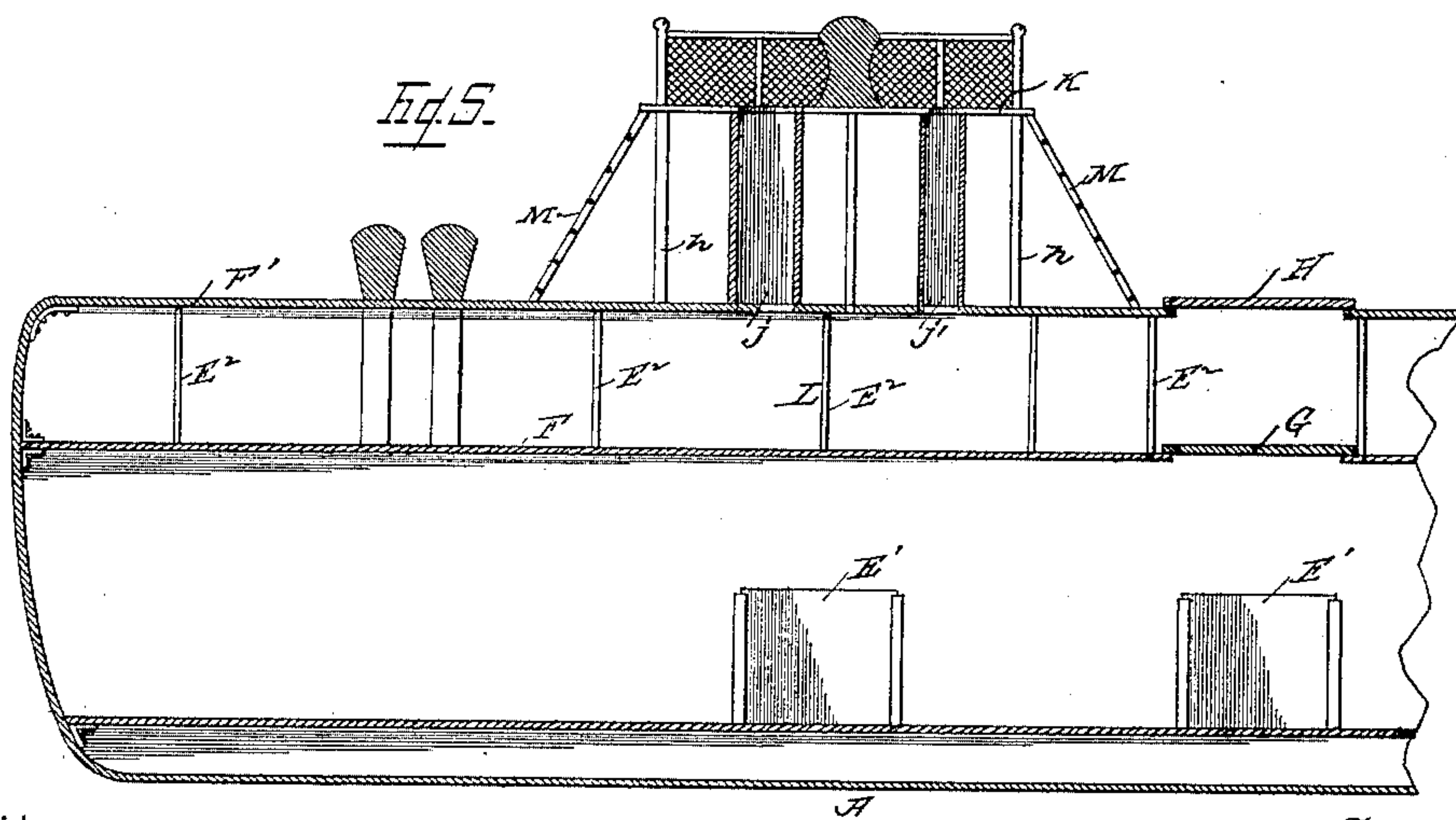
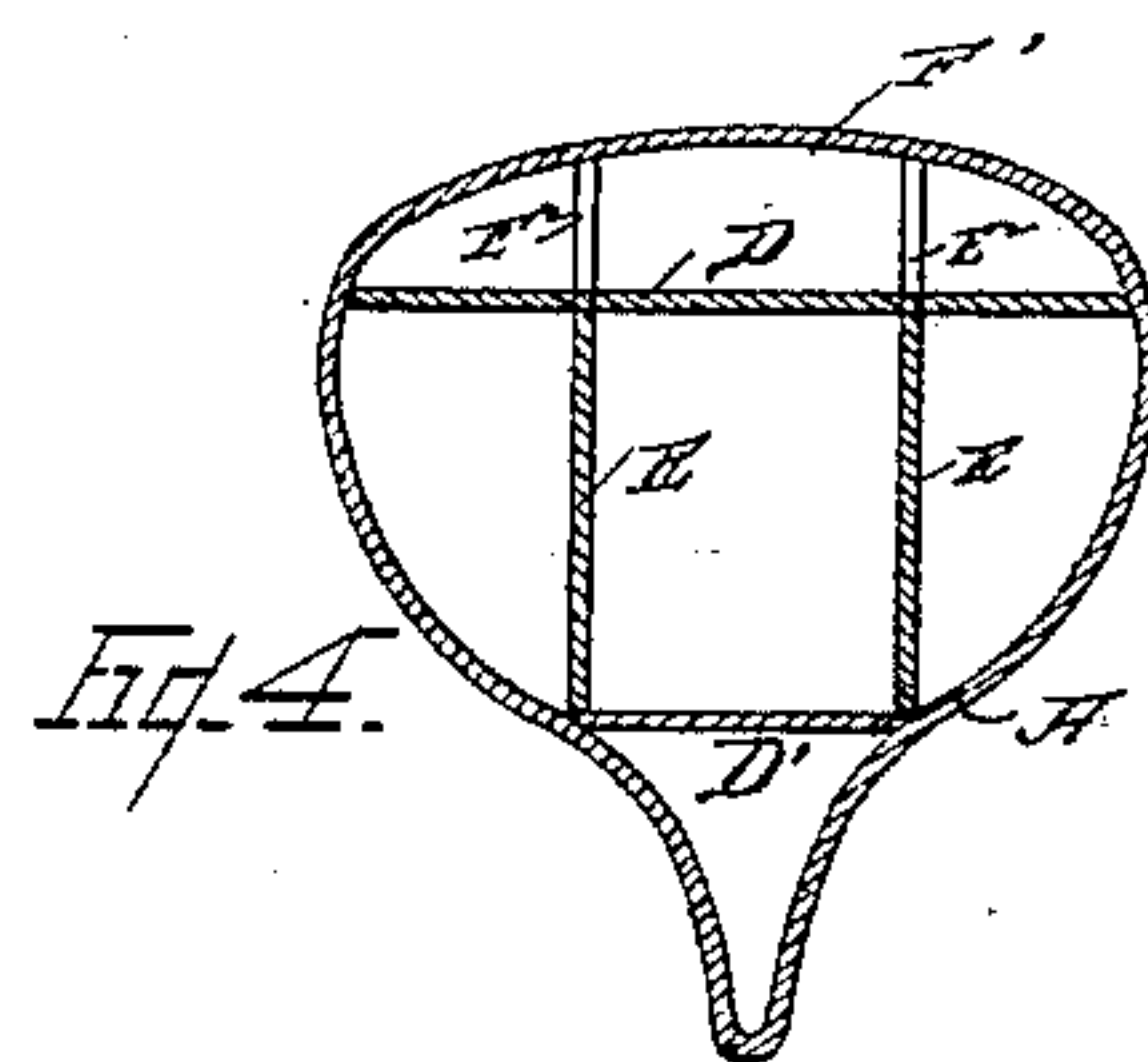
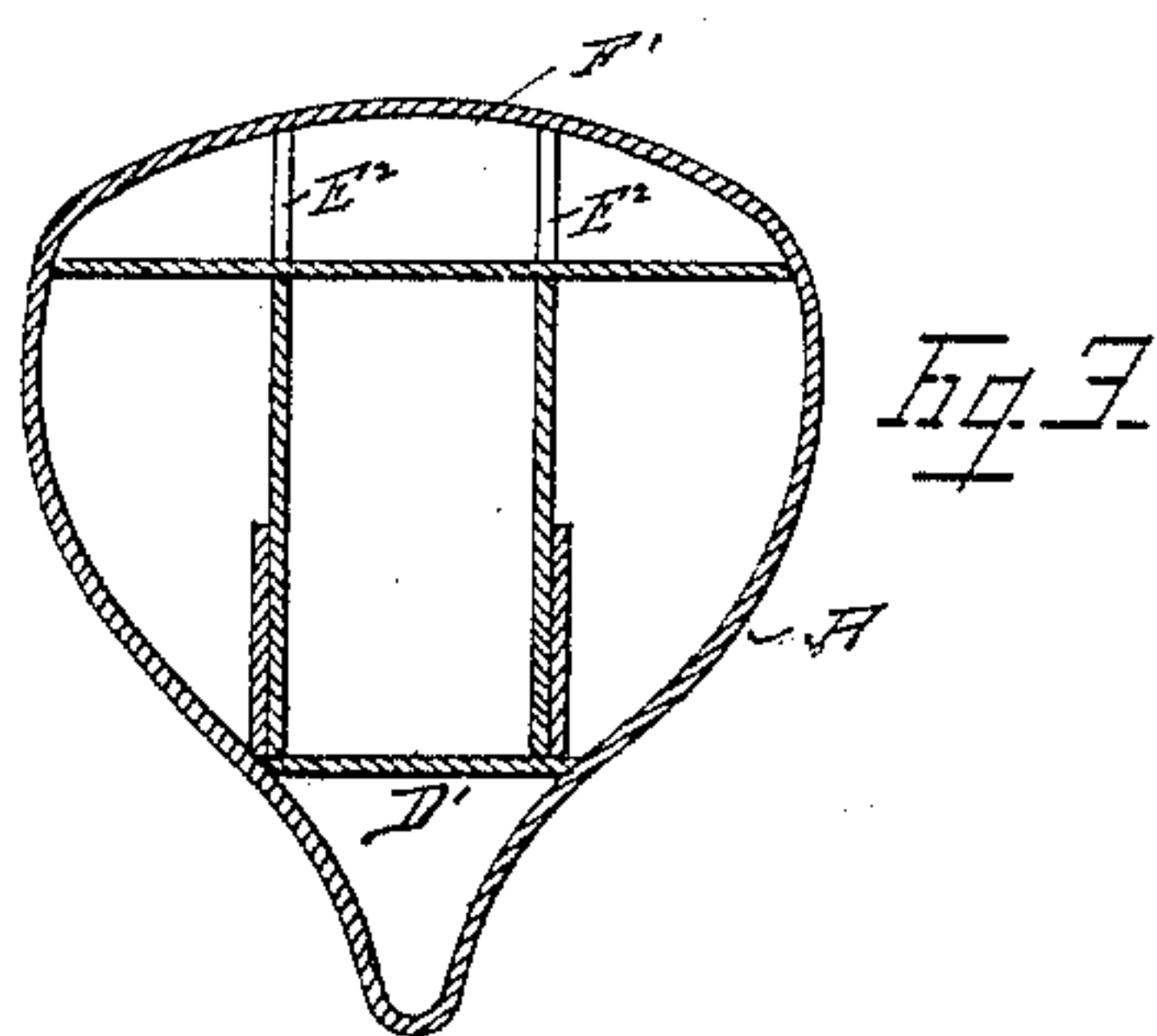
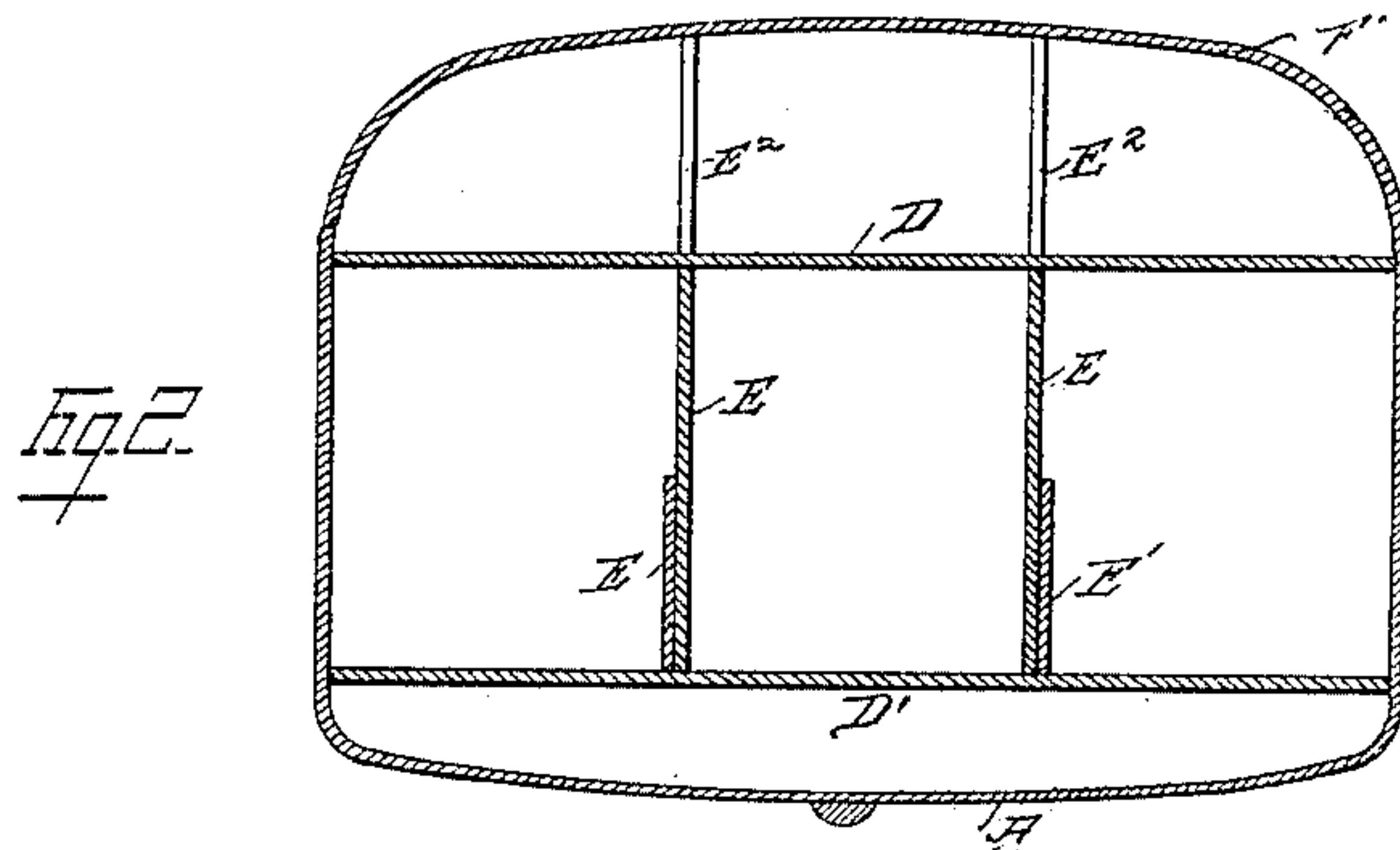
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his Attorney.



# UNITED STATES PATENT OFFICE.

ALEXANDER McDOUGALL, OF DULUTH, MINNESOTA.

## TOW-BOAT.

SPECIFICATION forming part of Letters Patent No. 393,997, dated December 4, 1888.

Application filed April 28, 1888. Serial No. 272,186. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER McDOUGALL, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Tow-Boats; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

In Letters Patent No. 241,813, granted to me May 24, 1881, for a tow-boat, and in other Letters Patent, No. 259,889, granted to me June 20, 1882, for a tow-boat, I have described certain forms of hull and of the construction and arrangement of the frame and of turrets supporting working-decks as adapted to said tow-boats, for the purpose designed.

In building a tow-boat of the character described, I have become aware of certain improvements over the inventions described and illustrated in said Letters Patent, which will better adapt the boat for the carriage of oil, ores, coal, &c., which improvements I will proceed to describe and afterward claim as new.

For the better understanding of these improvements reference should be had to the drawings, in which—

Figure 1 is a side elevation of the hull, the center being broken out; Fig. 2, a vertical central cross-section of the hull. Fig. 3, a vertical cross-section at the bow on lines  $x x$  of Fig. 1; Fig. 4, a similar cross-section at the stern on lines  $y y$  of Fig. 1; Fig. 5, a vertical longitudinal section of the bow and forward working-deck; Fig. 6, a similar section of the stern and after working-deck; Fig. 7, a detail of construction of the upper deck, and Fig. 8 details of construction of hatch and combings.

Similar letters denote corresponding parts in each figure.

The hull A, pointed at both ends, designed to be built, preferably, of steel plates secured to steel ribs, each of which is continuous throughout, is for the greater part of its length nearly flat upon the bottom, with rounded corners, vertical sides, and a top, in the shape of a flattened arch, springing from the point of load-line, as shown in the drawings, in this respect differing from the shape of the tow-boats described and illustrated in my said

Letters Patent, and assuming more nearly a rectangular form with rounded corners. This form gives a greater carrying capacity with the least draft, a matter of great consequence in shallow waters, while the rounded corners give enough of the arch shape to insure the requisite strength, with a frame and plates as light as possible. The bow, substantially semi-circular at the cross-section  $x x$  for the upper half of the hull, in the lower half is hollowed out, in this last respect being of a well-known form. The advantage over this form of bow is to prevent burying in waves and to allow the bow to rise and ride easily over such waves. In like manner the stern at the cross-section  $y y$  is of a similar shape, the purpose being to prevent the stern from sinking too deeply in rough seas. In both bow and stern this form differs from that described and illustrated in my former patents, where the cross-sections in corresponding places have nearly the form of circles, with all lines rounded out and without hollow lines. Upon this hull A there is a skag, B, of such a size as enables me to use a rudder, C, of the usual form in seagoing vessels, and comparatively high and narrow instead of the low and wide one of the former patents, by means of which, owing to the hollow run of the boat, I am enabled to use a rudder that is less liable to be destroyed or injured in bad weather than the kind shown in said former patents.

In a boat such as I am now describing I prefer to have the width and depth greater in proportion to the length than pointed out in said patent, No. 259,889, viz., about twenty-five feet in width for a length of two hundred feet and a depth of about twenty feet; and I am enabled to make the hull sufficiently strong for the carriage of ores and other heavy material, while dispensing with the cross-beams E of said last-named patent, by substituting instead heavy main-deck beams D and bulk-heads E, running the whole length or nearly the whole length of the boat, so as to divide the hull into several compartments, (three being shown in the drawings,) said bulk-heads being firmly secured at the top to the main-deck beams and at the bottom to the floor-beams D', and having stanchions E<sup>2</sup> between said main-deck and the upper deck, in line with the bulk-heads E. The purpose of these



bulk-heads is not to form water-tight compartments, to keep the boat afloat if stove in at some part, but to strengthen the hull and keep certain cargoes from shifting position.

5 These bulk-heads are provided with sliding doors E' at intervals conveniently corresponding with the hatchways, adapted to be raised by a tackle operated by the windlass or capstan.

10 Upon the main-deck F are numerous hatchways, G, arranged, preferably, along a central line, each hatch being composed, preferably, of a single plate of metal of the proper size. To make good the strength of this deck, weakened by numerous hatchways, a strengthening-plate, *a*, may be run nearly the whole length of the boat on the under side of the beams and directly below the hatch-combings *b*, which may be narrow plates running the length of each hatchway or running throughout the length of the entire series. The hatches G preferably hold their places by gravity alone, and are pulled in one direction to open the hatch and in the other to close the hatchways by ropes leading to the windlass or capstan. The hatchways H and H' on the upper deck, F', corresponding in position to those in the main-deck, require more specific mention, as, with regard to them, there is need of excluding water when the hatches are closed. Over the ribs which support this deck are lining-plates *c* on each side of the hatchways and running the whole length of the boat. Upon this upper deck, F', are hatch-combings *d*, running on each side of the hatchways the whole length of the series, each combing being preferably a narrow plate.

The hatches are maintained in position when the hatchways are closed by numerous screw-bolts *e*, which pass down through the deck-plates and the lining-plates *c*. A rubber or other suitable elastic lining, *f*, is attached to the under side of the hatch near its edges, and the compression of this lining by the screw-bolts *e* renders all the joints about the hatches water-tight. Four other screw-bolts, *g*—one at each corner of the hatch—pass down through the same and rest at their lower ends upon the deck-plates at the edges of the hatchways. By setting upon these screw-bolts after the screw-bolts *e* are removed the hatch is raised, so that it rides upon the ends of such screw-bolts *g*, and the hatch may be moved back or forth to cover or uncover the hatchway without injury to the rubber lining. These movements of the hatches in either direction are conveniently made by the use of the windlass and capstan.

The bulk-heads, with sliding doors, the particular hatches and hatchways, and the

strengthening of the deck-beams, as just described, are neither described nor illustrated in either of my before-mentioned patents. In my former patent, No. 259,889, I described and illustrated working-decks at each end of the boat mounted upon turrets. To avoid the danger of the waves striking such turrets "climbing" over them, I propose to mount my working-decks K K' on numerous pipes, *h*, properly secured to the deck proper and to the under side of the working-deck, and to place in the forward working-deck and in the after part of it a small cylinder, *j*, to afford a passage to the fore-castle L, and another cylinder, *j'*, to carry the shaft to operate the windlass. These decks K and K' are accessible from the main-deck by heavy metal ladders M M', arranged fore and aft, and firmly secured at each end, thereby bracing and supporting said decks very firmly. In the after working-deck K' there are small cylinders in line fore and aft—one, *k*, to give access to the cabin, another, *k'*, for the capstan-shaft, and a third, *k''*, for the chains for the steering-gear. In the loading of this tow-boat the longitudinal bulk-heads prevent the shifting of the cargo in stormy weather, and in the unloading, the doors to the bulk-heads being raised, the entire cargo can be pumped out of the central compartment. In loading ore, the doors being raised, the cargo can be conveniently distributed by hand into the side compartments, and, as such cargo is very heavy and takes but little space, the dropping of the doors upon the loaded cargo will effectively prevent the shifting of it in bad weather.

Having thus described my improvements, what I claim as new therein is—

1. The hull for a tow-boat with a central body nearly square in cross-section, with vertical sides and rounded corners, and with sharp ends, semi-cylindrical in the lines of the upper section, and with hollowed-out lines in the lower section thereof, substantially as set forth.

2. In combination with the hull of a tow-boat, hatchways arranged in series, sliding hatches composed of a single plate of metal, and provided with water-tight packing, screw-bolts to fasten said hatches upon the hatchways, and other screw-bolts to raise said hatches, so that the same may be moved back and forth without injury to the packing.

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

ALEXANDER McDOUGALL.

Witnesses:

E. B. BRACE,  
E. H. BERRY.