

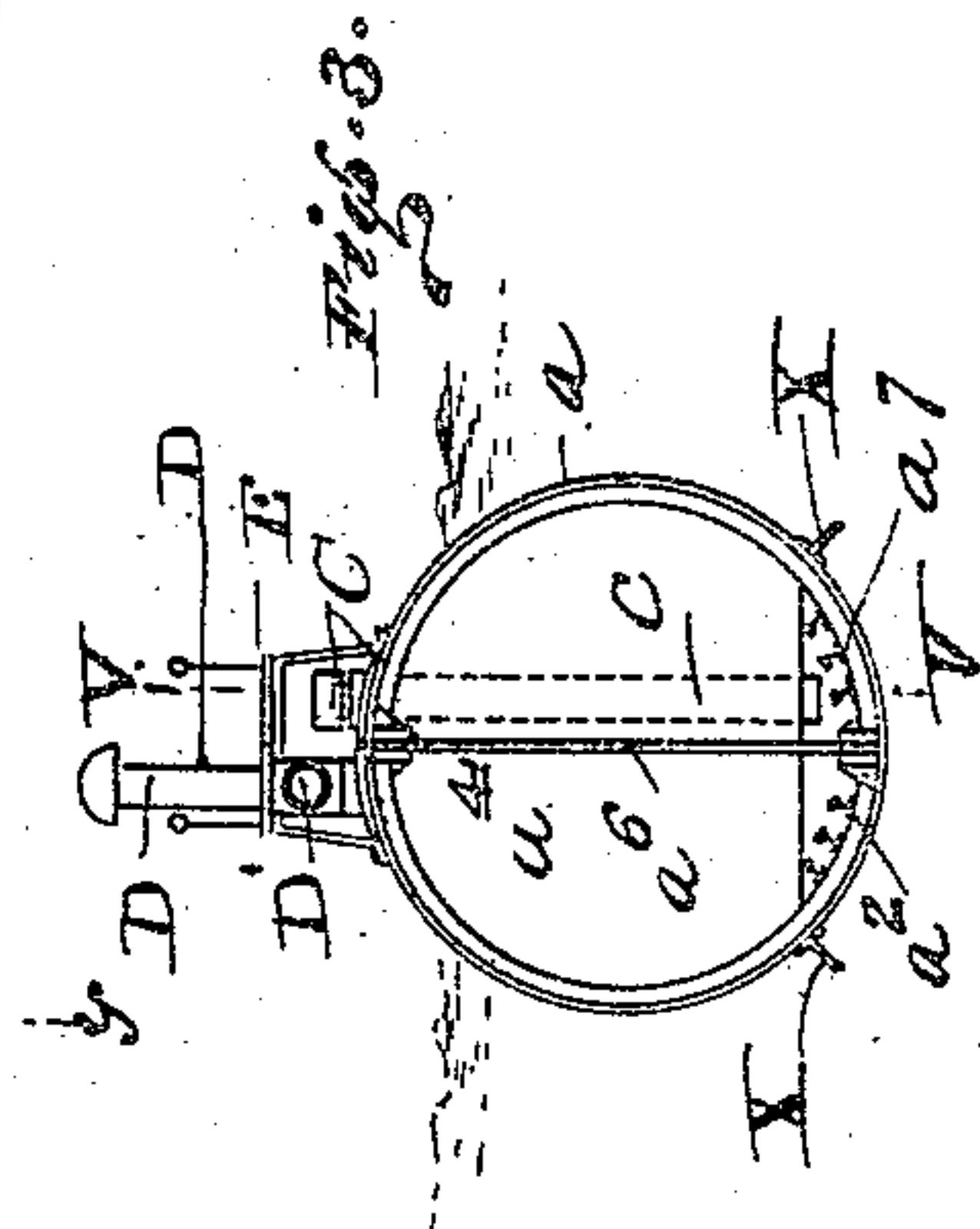
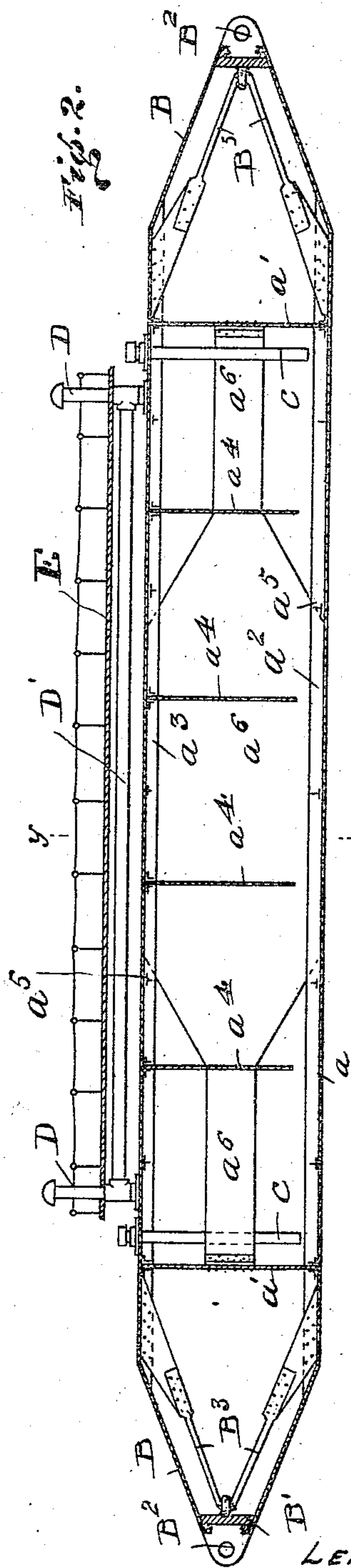
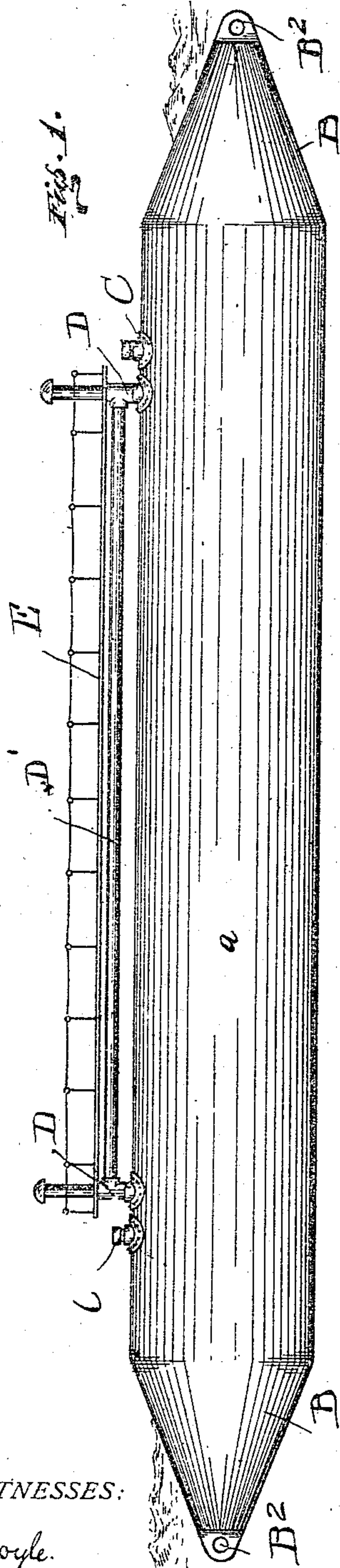
No. 733,583.

PATENTED JULY 14, 1903.

L. P. HARVEY.  
FREIGHT BARGE.

APPLICATION FILED SEPT. 2, 1902.

NO MODEL.



WITNESSES:

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## UNITED STATES PATENT OFFICE.

LEWIS P. HARVEY, OF OAKLAND, CALIFORNIA, ASSIGNOR OF THREE-FOURTHS TO WILLIAM LEACH AND EDWARD S. HOUGH, OF OAKLAND, CALIFORNIA, AND JAMES DICKIE, OF SAN FRANCISCO, CALIFORNIA.

## FREIGHT-BARGE.

SPECIFICATION forming part of Letters Patent No. 733,583, dated July 14, 1903.

Application filed September 2, 1902. Serial No. 121,893. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS P. HARVEY, a citizen of the United States, residing at 1355 Thirteenth avenue, in the city of Oakland, county of Alameda, and State of California, have invented certain new and useful Improvements in Freight-Barges; and I do hereby declare the following to be a full, clear, and exact description of the said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to improvements in freight-barges, and more particularly to barges for carrying oil or other homogeneous cargo.

The objects sought to be accomplished are to construct a seaworthy vessel of large carrying capacity, light towage resistance, cheapness of construction and maintenance.

The invention consists, broadly, of an elongated cylindrical body portion having cone-shaped buoyant ends with suitable towing-eyes therein, suitable bulkheads and braces, and suitable loading and discharging pipes, gas-vents, expansion-trunks, &c.

Heretofore the transoceanic transportation of homogeneous cargoes, oil particularly, has been confined to navigable vessels, converted or constructed to carry in bulk, subject to the dangers of navigation incident to their size and construction, whereas the essence of this invention is to divide the cargo into units contained in barges practically submerged and protected against the strains of the present construction with exposed freeboard, with the additional advantage of light draft. This method of towing a number of barges brings to marine transportation all the advantages of railroad traffic in the same industry in that the barges, like the tank-cars, can be distributed along the route to be picked up or dropped without the disadvantages and cost incident to holding a large vessel for full cargo or other reasons. The advantages of this system of transportation being obvious, further description will be confined to the construction of the barges.

In the drawings, Figure 1 is a side elevation

of a barge constructed in accordance with this invention. Fig. 2 is a vertical cross-section of the same on the line V V in Fig. 3. Fig. 3 is a cross-section on the line y y, Fig. 2.

In construction the barge, preferably of steel throughout, consists of an elongated cylindrical body portion or hold  $a$ , having the tight bulkheads  $a'$ , dividing it from the conical buoyant ends B. The shell is constructed of steel plates riveted and joined in the approved manner, having the keelson  $a^2$  and the girder  $a^3$  extending the full length on the center of gravity. The wash-bulkheads  $a^4$  prevent "swashing" of the cargo and in connection with the annular ribs  $a^5$  add lateral stiffness to the structure. The wash-bulkheads do not extend entirely to the keelson. This is to permit flow between the said bulkheads in loading and unloading cargo. The vertical wall  $a^6$ , extending between the keelson  $a'$  and the girder  $a^2$  amidships and longitudinally between the bulkheads  $a'$ , gives a vertical stiffness and forms the "backbone" of the barge, when the dimensions are large, (approaching one hundred feet,) also tends to prevent shifting of the cargo laterally. To preserve an even keel, it is advisable to provide ballast at the keel. This may be longitudinal rails  $a^7$  or any suitable dead-weight. The loading and unloading pipes C extend into the hold to near the bottom, as many being provided as desired. To provide for expansion of cargo, the pipe D', extending between the gas-vents D, provides space for the displaced cargo. For convenience bridge E is extended along the back of the barge. This and all superstructure may be dispensed with, as also may be the bilge keels X, without altering the spirit of the invention. The buoyant cone-shaped ends B, forming a continuation of the body portion, reduces the towage resistance in front and suction astern. The ends being air-chambers add buoyancy to offset the weight of the barge, so that at full load the specific gravity of the cargo approaches the displacement close enough to just float the barge with some freeboard at the surface. The ends B are tapered to the cast-steel block B', to which the plates are



riveted, leaving the towage-eye  $B^2$  exposed, into which the towline is made fast. The towage strain is transmitted from the block  $B'$  to the keelson  $a^2$  and girder  $a^3$  through the tie-rods  $B^3$ , which distributes the strain equally throughout the structure. Suitable cleats, mooring-rings, &c., can be provided to suit circumstances. For rivers and shoal water it may be found desirable to construct the barges oblong in cross-section to reduce draft. Other structural changes to suit circumstances may be evolved in practice—such, for instance, as making the cone-shaped ends fall away from approximately the water-line instead of on the axial center, as illustrated, without diverging from the spirit of the invention.

For barges of small dimensions, or where it is desirable to ship "knocked down," wood can be used to advantage in the construction. Where wood is used, it is formed into staves and put together in the form used in constructing wooden pipe-lines, wherein the staves in cross-section form segments of the circumference of the cylinder, the butts being offset.

It is obvious that docking is unnecessary. By reason of the form any portion of the barge can be exposed for calking, painting, &c., by merely rolling it over until the desired portion is exposed.

Having thus described this invention, what I claim, and desire to secure by Letters Patent, is—

1. A barge having a cylindrical body portion with conical ends, air-chambers formed in the conical ends, and means connecting the conical ends inside the body portion. 35

2. A barge having a cylindrical body portion with conical ends, bulkheads separating the body portion from the conical ends and forming air-chambers, and a longitudinal partition connecting said bulkheads. 40

3. A barge having a cylindrical body portion with conical ends, bulkheads separating the body portion from the conical ends and forming air-chambers, and a longitudinal partition connecting said bulkheads, said partition extending from the keelson to the top in the center but tapering at its ends to admit a flow of the cargo. 45 50

4. A barge having a cylindrical body portion, transverse partitions in said body portion, bulkheads at the ends of said body portion, and a longitudinal partition connecting said bulkheads and intersecting said transverse partitions. 55

5. A barge having a cylindrical body portion with tapered ends, towing-eyes in said tapered ends, and means directly connecting said towing-eyes, and forming a brace for the barge. 60

In testimony whereof I have hereunto set my hand this 15th day of August, 1902.

LEWIS P. HARVEY.

Witnesses:

BALDWIN VALE,  
A. J. HENRY.