

(No Model.)

J. HADLEY & F. FOSTER.  
DEVICE FOR FLOATING VESSELS OVER BARS.

No. 515,878.

Patented Mar. 6, 1894.

FIG. 1.

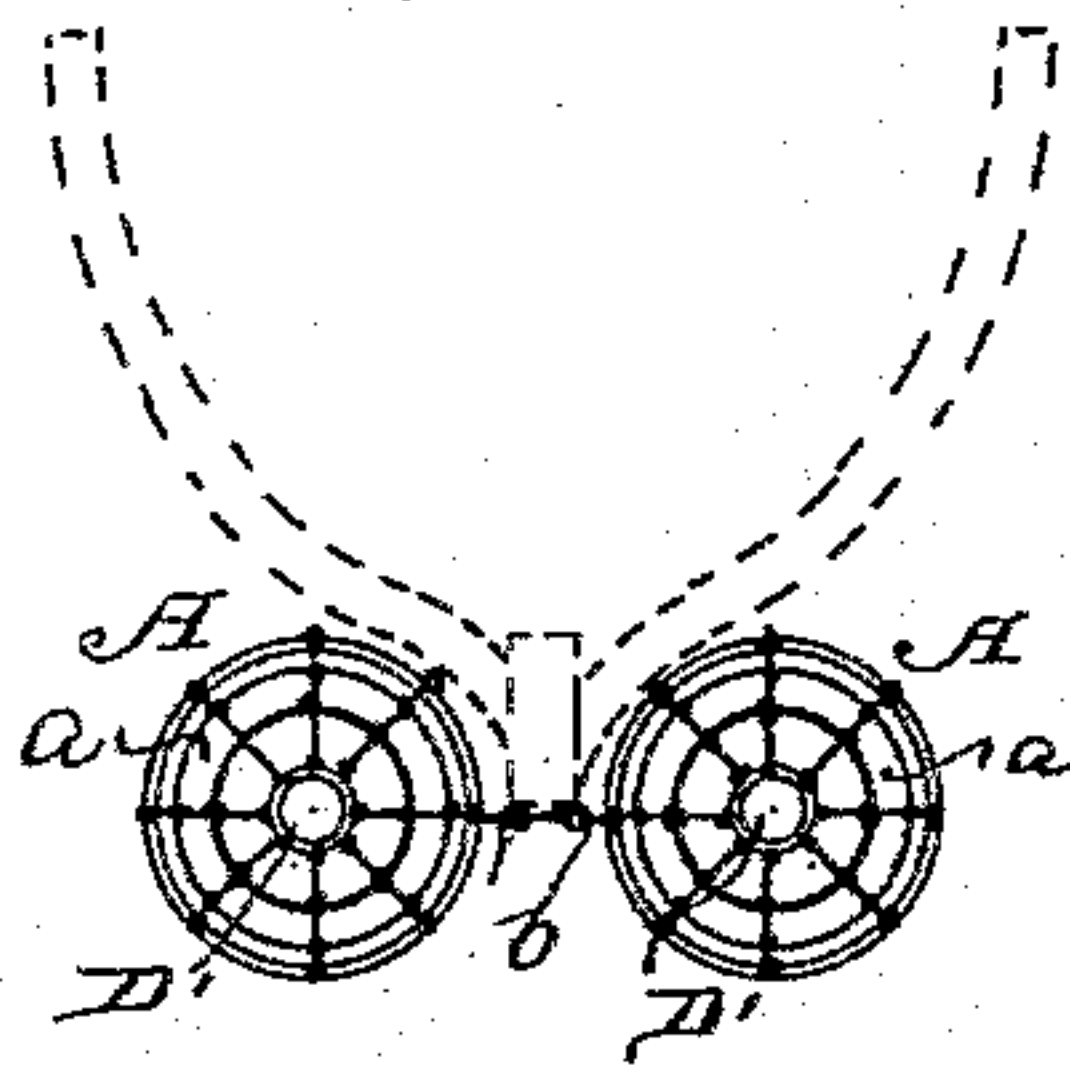


FIG. 2.

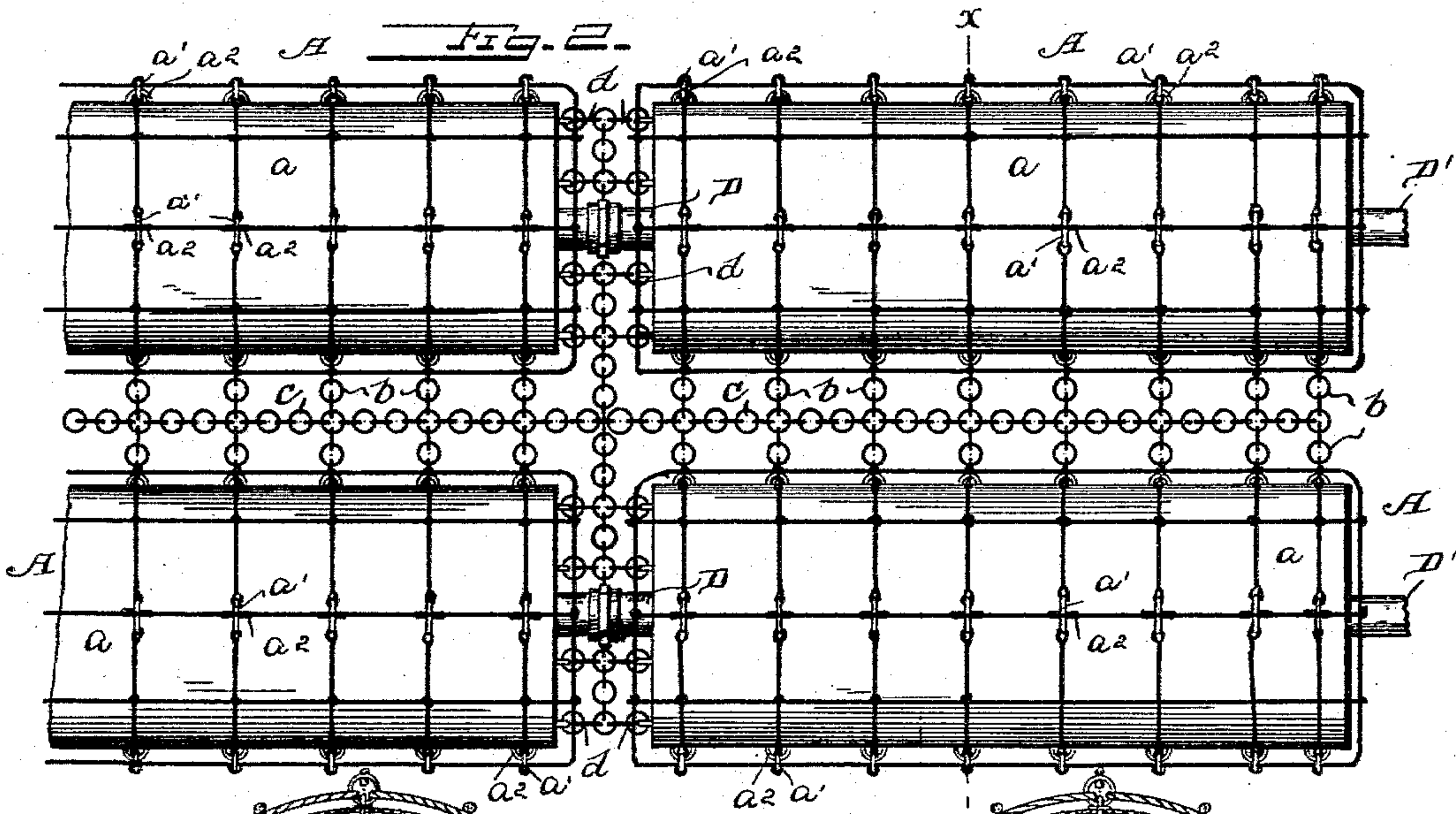
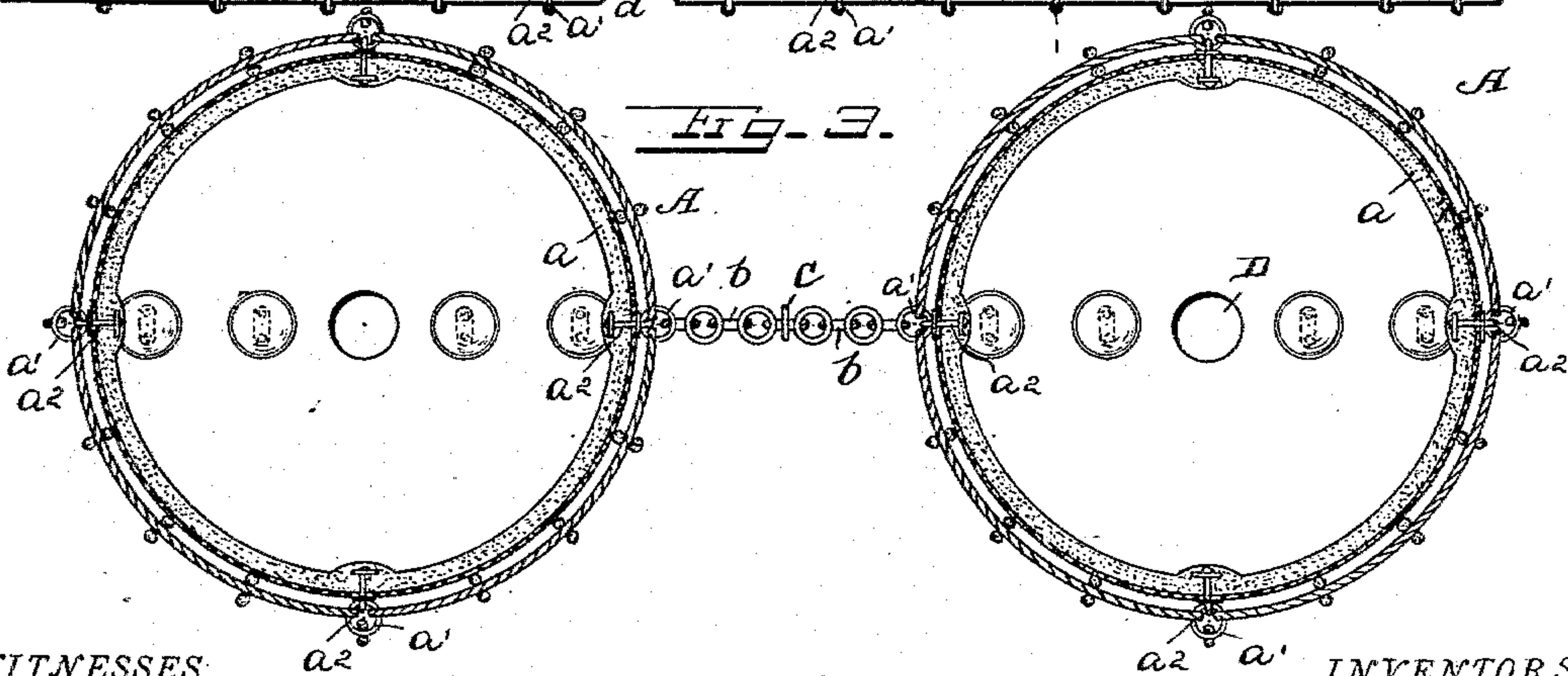


FIG. 3.



WITNESSES

Jesse Heller.  
Phillips

INVENTORS  
James Hadley,  
Festus Foster,  
by E. W. Anderson  
their Attorney



# UNITED STATES PATENT OFFICE.

JAMES HADLEY AND FESTUS FOSTER, OF HAVEN, KANSAS.

## DEVICE FOR FLOATING VESSELS OVER BARS.

SPECIFICATION forming part of Letters Patent No. 515,878, dated March 6, 1894.

Application filed April 15, 1893. Serial No. 470,416. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES HADLEY and FESTUS FOSTER, citizens of the United States, and residents of Haven, in the county of Reno and State of Kansas, have invented certain new and useful Improvements in Devices for Floating Vessels over Bars; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is an end view with hull shown in dotted line. Fig. 2 of the drawings is a plan view, and Fig. 3 is a vertical transverse sectional view.

This invention has relation to certain new and useful improvements in means for lifting ships or vessels over bars or reefs, or through shallow water, the object being to provide collapsible bags of improved character, which may be placed underneath the vessel or ship, and which when inflated with air or gas will exert a sufficient lifting force to lighten the draft; and the invention consists in the novel construction and combination of parts, all as hereinafter specified and pointed out in the claim.

Referring to the accompanying drawings the letter A designates the collapsible bags, preferably cylindrical in form, and which consists each of an inner bag  $a$  of rubber lined canvas, surrounded or inclosed by a covering of netting made of heavy cord or rope. The inner bags  $a$  are secured to the netting upon the upper, lower and lateral longitudinal edges, and also where the air tubes hereinafter described pass through, by means of rings  $a'$  woven into or otherwise secured to the netting, and by staples  $a^2$  which are secured in the bags. Said staples are driven through the thickness of the rubber lined canvas and riveted to plates or washers on the inside of the bag. A washer or plate may also be used at the outside, and the staple made rigid by riveting the points of the staple. The plates or washers at the inside of the bag are covered or seared over with rubber, in order to render the bag air tight. Said bags are arranged in pairs as shown, connected with each

other along their adjacent longitudinal edges by a series of short chains or flexible connections  $b, b$ , which are attached to rings  $a'$ , held in the outer covering of cord or rope. These chains are employed at short intervals in order to withstand the strain upon them. Each pair is also connected to its neighbor by a series of short chains  $d, d$ , between adjacent ends of the bags, and a central longitudinal chain or cable C is also employed, to which all the short chains  $b, b$ , are connected, in order to equalize the lifting force of the entire series. The bags are further connected, each with the corresponding bag of the neighboring pair, by a short air tube D, and the end pair of bags have tubes D' to which are designed to be connected pipes which extend to an air pump which may be carried upon the ship or vessel itself, or by an assisting tug or other boat. The bags are drawn, (collapsed or with but little air in them,) underneath the ship, one of each pair lying against either side of the hull, with the chains underneath the keel, as shown in Fig. 1. They are then inflated to the necessary degree. For large vessels, the bags should be about forty feet in length, and about fifteen feet in diameter, but their size will of course depend upon the ship to be lifted.

We are aware that collapsible bags are not new for the purpose above described, and we do not therefore claim the invention broadly.

What we claim as our invention, and desire to secure by Letters Patent, is—

A device for floating vessels, &c., comprising a series of collapsible or inflatable bags, a heavy cord or rope netting surrounding and inclosing each of said bags, rings held in said netting, flexible connections attached to said rings and connecting said bags in pairs, and said pairs in series, air pipes connecting said bags in series, and means on the bags at one end of the series for connection with an air supply, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES HADLEY.  
FESTUS FOSTER.

Witnesses:

T. V. STOUT,  
Mrs. H. FINLEY.