

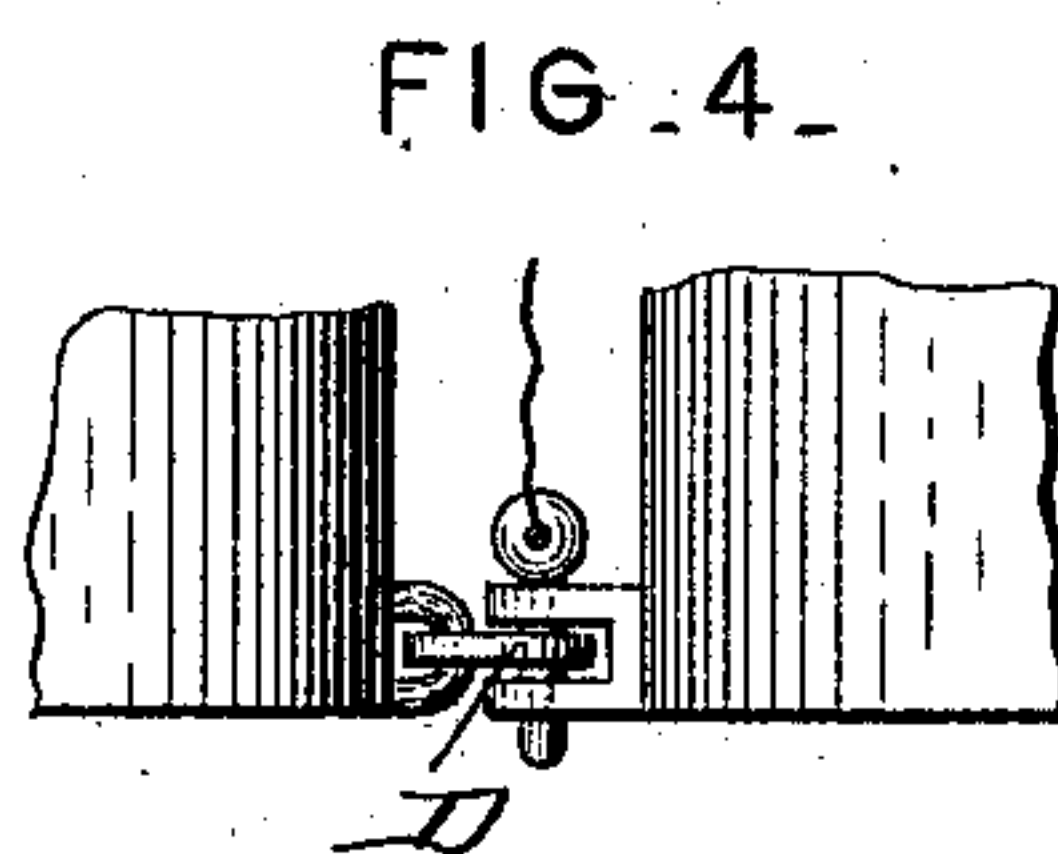
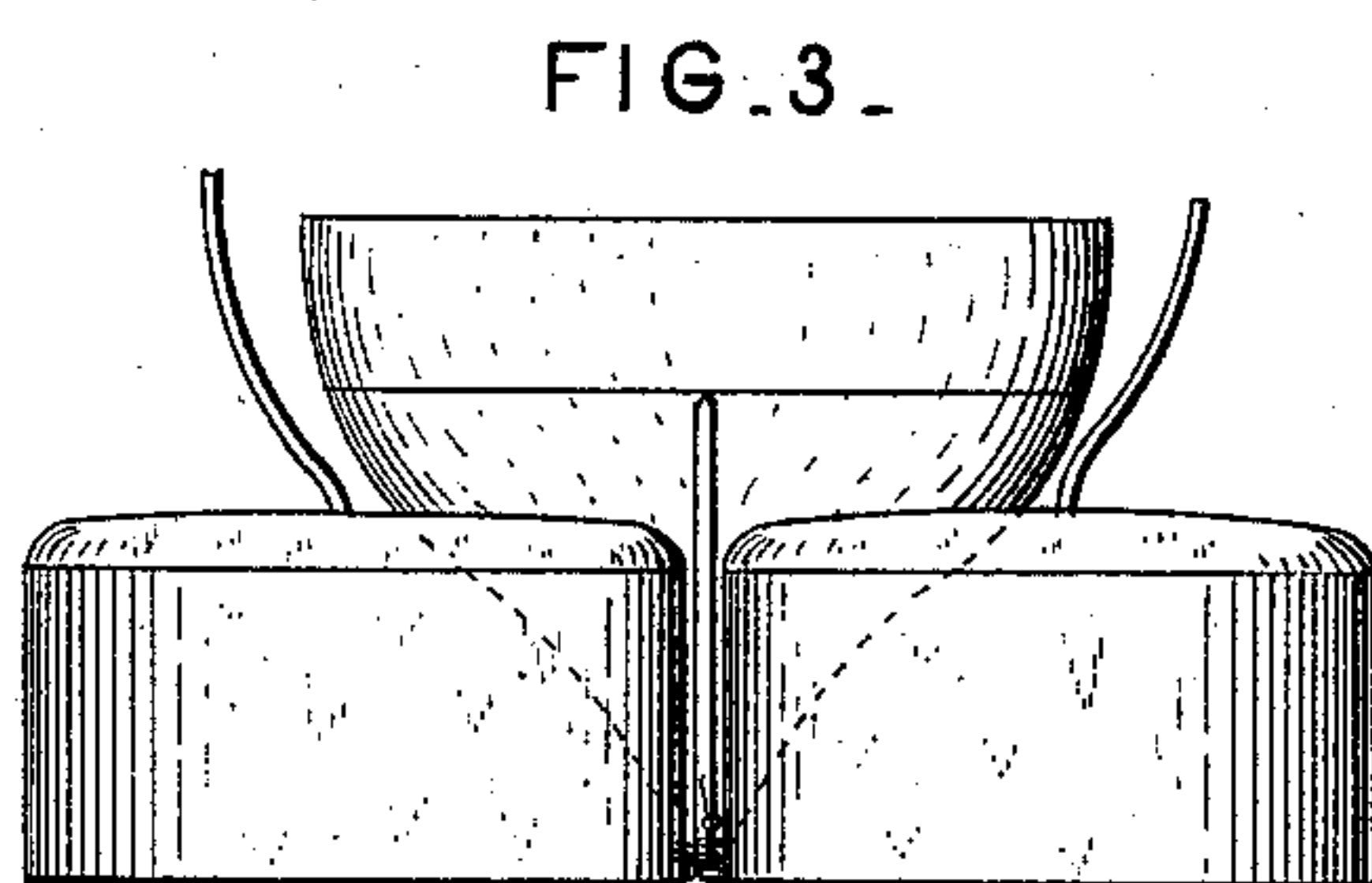
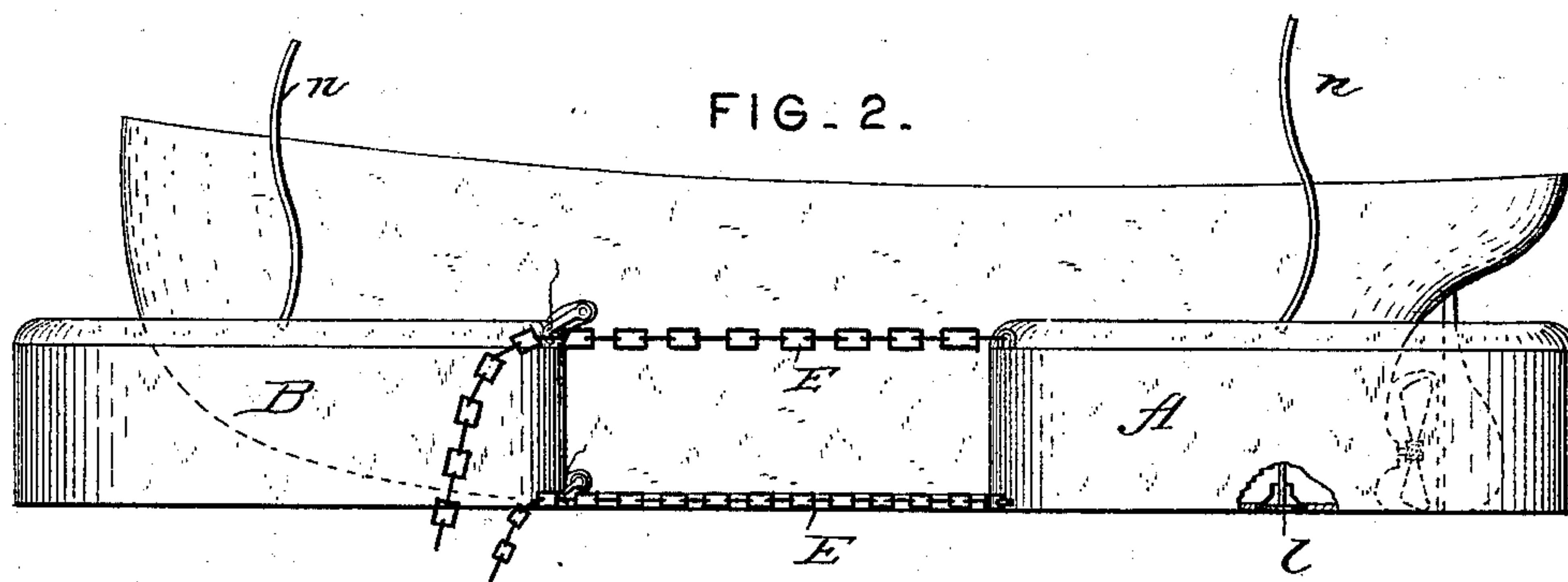
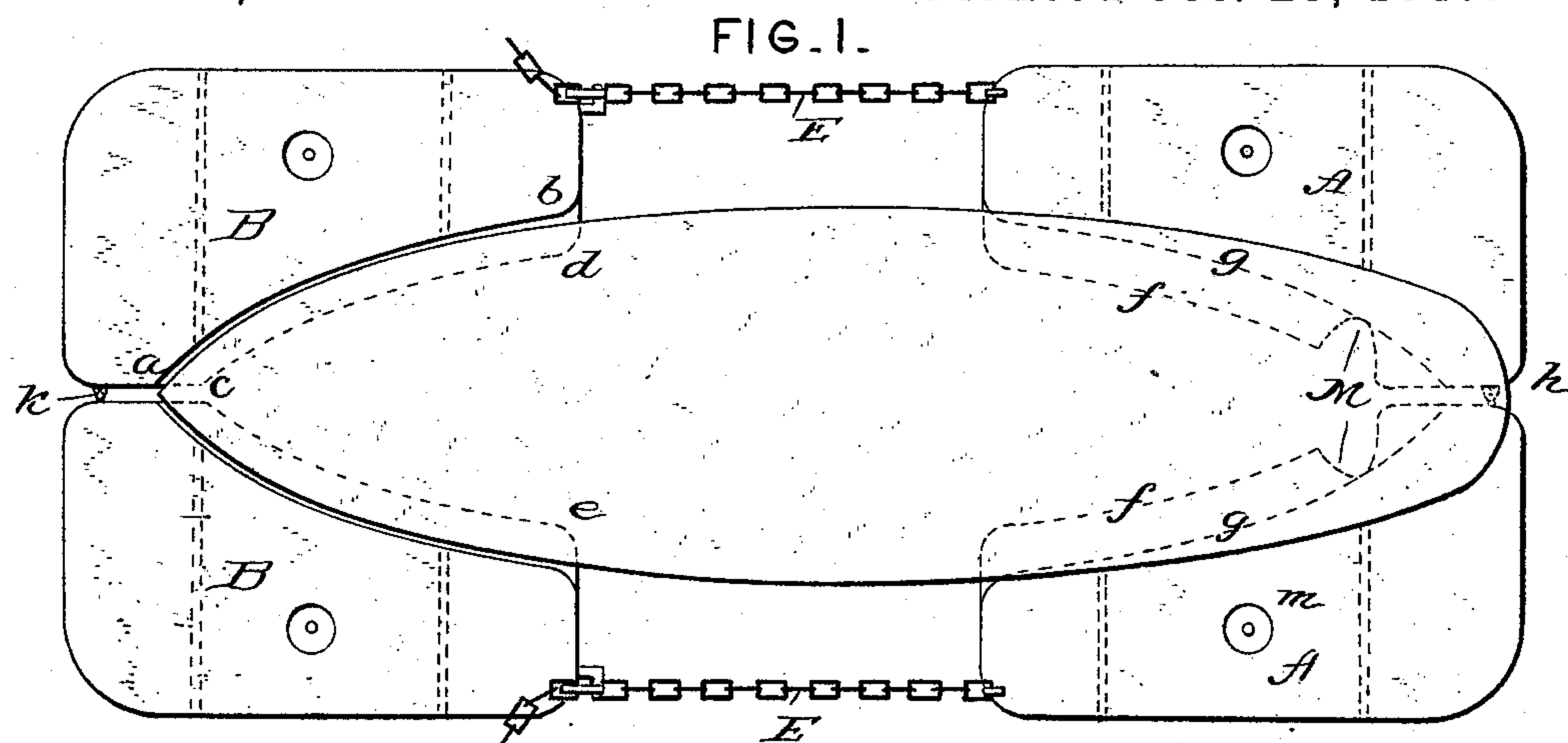
(No Model.)

A. F. EELLS.

RAISING SUNKEN OR STRANDED VESSELS.

No. 372,210.

Patented Oct. 25, 1887.



Attest:
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UNITED STATES PATENT OFFICE.

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RAISING SUNKEN OR STRANDED VESSELS.

SPECIFICATION forming part of Letters Patent No. 372,210, dated October 25, 1887.

Application filed April 7, 1887. Serial No. 234,039. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. EELLS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Raising Sunken and Lightening Stranded Vessels; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to the raising of sunken and the lightening of stranded vessels. Heretofore for this purpose it has been proposed to provide caissons for the bow and stern of vessels, connected together at the sides by ropes running fore and aft, the said caissons having their inner faces conforming to the longitudinal lines of the vessel; but as the caissons were approximately square a very small bearing-surface was offered to the sides of the vessel, and but comparatively little floating or lifting surface was presented for the lifting action of the water, a large amount of floatage being necessary at all times, and absolutely so when lightening a vessel stranded in shallow water. Another form of caisson, which is open to the same objection, of presenting but comparatively little floatage properties, consists of a caisson conforming to the longitudinal and transverse lines of a vessel, with its outer sides curving in substantially the same manner, so that the good effect of the inward curvature beneath the hull is lost by the curve of the outer wall of the caisson in the same direction, thus lessening in a marked degree the floatage properties of the caisson, especially in shallow water. The caisson thus arranged forms a deep narrow compartment, with very little lifting power.

It is the object of my invention to provide a caisson which, while conforming to both the longitudinal and transverse lines of the vessel, will be of such configuration as to practically inclose the entire forward and rear parts of the vessel (and a portion of the sides where the vessel is of great length) and extend to the front and rear, thus providing ample floatage to lift the largest vessels, whether in deep or shallow water.

In the accompanying drawings, Figure 1 shows a plan view of the hull and the caissons in place about the hull. Fig. 2 represents a side elevation of the same. Fig. 3 is an end

view of the same. Fig. 4 shows the connection between the side caissons.

In the drawings, A A are the aft and B C the fore caissons. They are made preferably of stout boiler-iron, and are suitably braced and built to resist the strain which may be put upon them in lifting the hulls of vessels from deep water. These caissons are built in four parts, as represented in the drawings, and their interior contour, or curve of the surface next to the hull, is made so as to fit any size or shape of hull within reasonable limits. To this end I make the curve—as, for example, *a b*—of a radius a little less than that of the curve of the smallest hull to which the caisson would be applied, so that under most circumstances, if not all, the bearing of the caissons against the hull would be approximately at the points *a b*. The surface of the caissons next to the hull corresponds approximately in shape to the vertical curve of the hull, as well as to the horizontal curve—that is, the lower part of the caisson extends underneath the hull, as shown in dotted lines *c d*, *c e*, and the lines *f* and *g*. As shown, they are made of such configuration as to almost inclose the bow and stern, their outer sides being vertical, their bottoms flat, and said outer sides being parallel with the vertical plane of the keel and extending to a point forward of the stem and aft of the stern-post, respectively, so that the capacity of the forward caissons increases from their after to their forward ends, and that of the after ones increases from their forward to their after ends, by which construction greater flotative power is provided to compensate for the decrease of area, in cross-section of the vessel from amidships to the bow and stern, and the caissons being widest at their extreme outer ends, the greatest flotative effect is produced at those points where it is most needed.

The caissons adapted to the stern of the vessel I provide with a cut-away portion to receive the screw and rudder, which thus prevents them from being injured and permits them to be used, if it should be found possible or desirable, during the lightening of the vessel. As in the forward part of the vessel, the caissons at the stern practically surround this end also, being made of the same configuration,

with the exception of the recesses for the screw and rudder. Each pair of caissons is connected as represented at D, Fig. 4. The after pair of caissons is connected at the stern, as shown at 5 the point *h*, and the forward pair at the point *k*. This connection may be of any suitable form to hold the parts together. The pairs are connected to each other by chains E, leading fore and aft alongside the hull, one pair above 10 and the other below, on the line of the outer faces of the caissons, to prevent the outward swing of the caissons at this point, which would occur if they were secured together on the line of the inner faces; but instead of chains 15 rods or any suitable connecting devices may be used. Each caisson is provided, as usual, with a valve, as shown at *l*, and a man-hole, *m*, and they are all adapted to be closed air-tight. Pipes *n* are shown for the purpose of 20 conducting compressed air into the caissons after they are sunk in order to expel the water and give buoyancy to the caissons.

In putting the apparatus into use the sections or caissons may be floated separately to 25 the position of the sunken vessel. They then may be filled and sunk, and after they are sunk they may be connected with the air-pipes and air-forcing apparatus, so as to expel the water to a point at which the caisson will be very 30 nearly in equilibrium or of the same specific gravity of the water, when it may be very easily moved into position under the hull. After being so put into position the connections are made at *h k*, and the pairs are connected 35 together by the chains or rod. The water is then expelled from the caisson by any suitable air-forcing mechanism floating on the surface of the water above. The caissons, as the water is expelled, will rise and lift the vessel from 40 its position without liability of any injury to the hull other than slight abrasions where the parts of the caissons come in contact with the hull.

The sections may, if desired, be made in 45 compartments, as shown in dotted lines.

For vessels of unusual length I may use

caissons similar to those described on each side, intermediate between the fore - and - aft caissons, suitably connected by means of chains or rods. 50

When the caissons are partially submerged, they may be pumped dry in the ordinary manner.

I claim as my invention—

1. An apparatus for raising sunken or light- 55 ening stranded vessels, consisting of caissons of the configuration described—namely, with their inner faces curved to correspond to the longitudinal and transverse lines of the hull against which they bear, and their body por- 60 tions rectangular in horizontal plane in cross-section, whereby great floatage power is provided—substantially as described.

2. An apparatus for raising sunken or light- 65 ening stranded vessels, consisting of caissons having their inner faces curved to correspond to the longitudinal and transverse lines of the hull against which they bear, with their body portions rectangular in horizontal plane in cross-section, with chains or the like running 70 fore and aft connecting the caissons at top and bottom on the line of their outer faces, substantially as described.

3. An apparatus for raising sunken or light- 75 ening stranded vessels, consisting of caissons for the bow and stern having their inner faces curved to correspond to the longitudinal and transverse lines of the hull against which they bear, with their body portions rectangular in horizontal plane in cross-section, the caissons 80 for the stern being provided with recesses, whereby they are adapted to fit around the screw and rudder without injury thereto, substantially as described.

In testimony whereof I have signed my name 85 to this specification in the presence of two subscribing witnesses.

ALBERT F. EELLS.

Witnesses:

CHAS. L. STURTEVANT,
ISADORE MIDDLETON.