

(No Model.)

2 Sheets—Sheet 1.

J. F. SPEARING.

MEANS FOR DEEPENING THE CHANNELS OF RIVERS, &c.

No. 275,534.

Patented Apr. 10, 1883.

Fig 1.

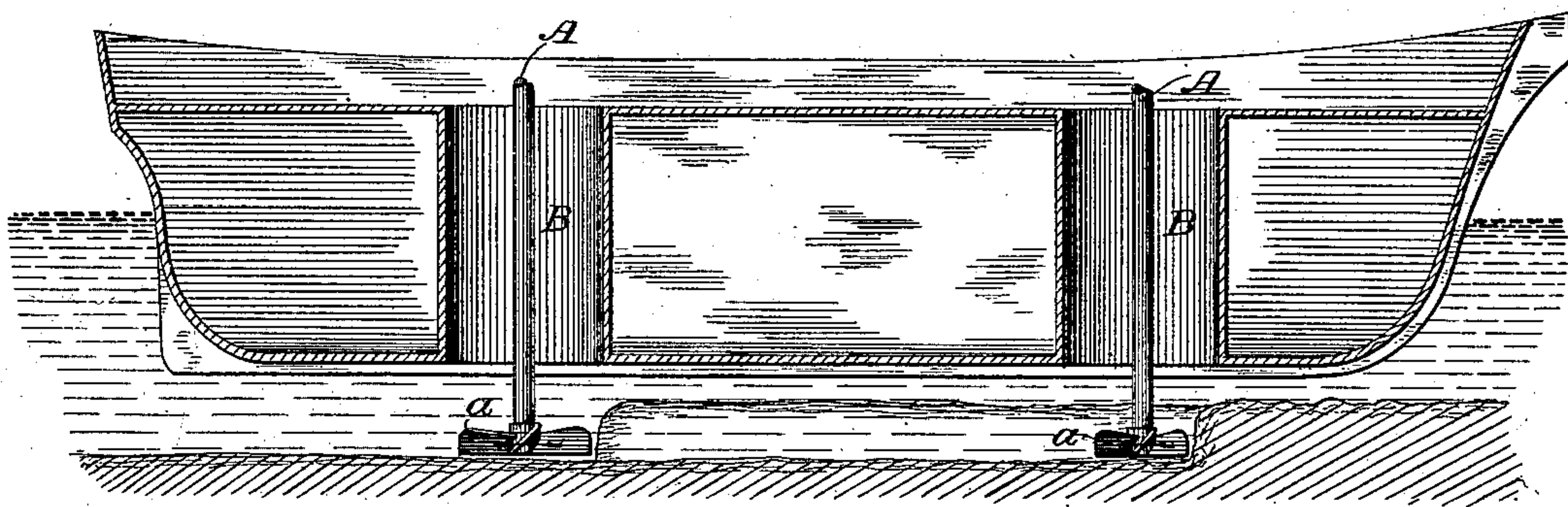


Fig 2.

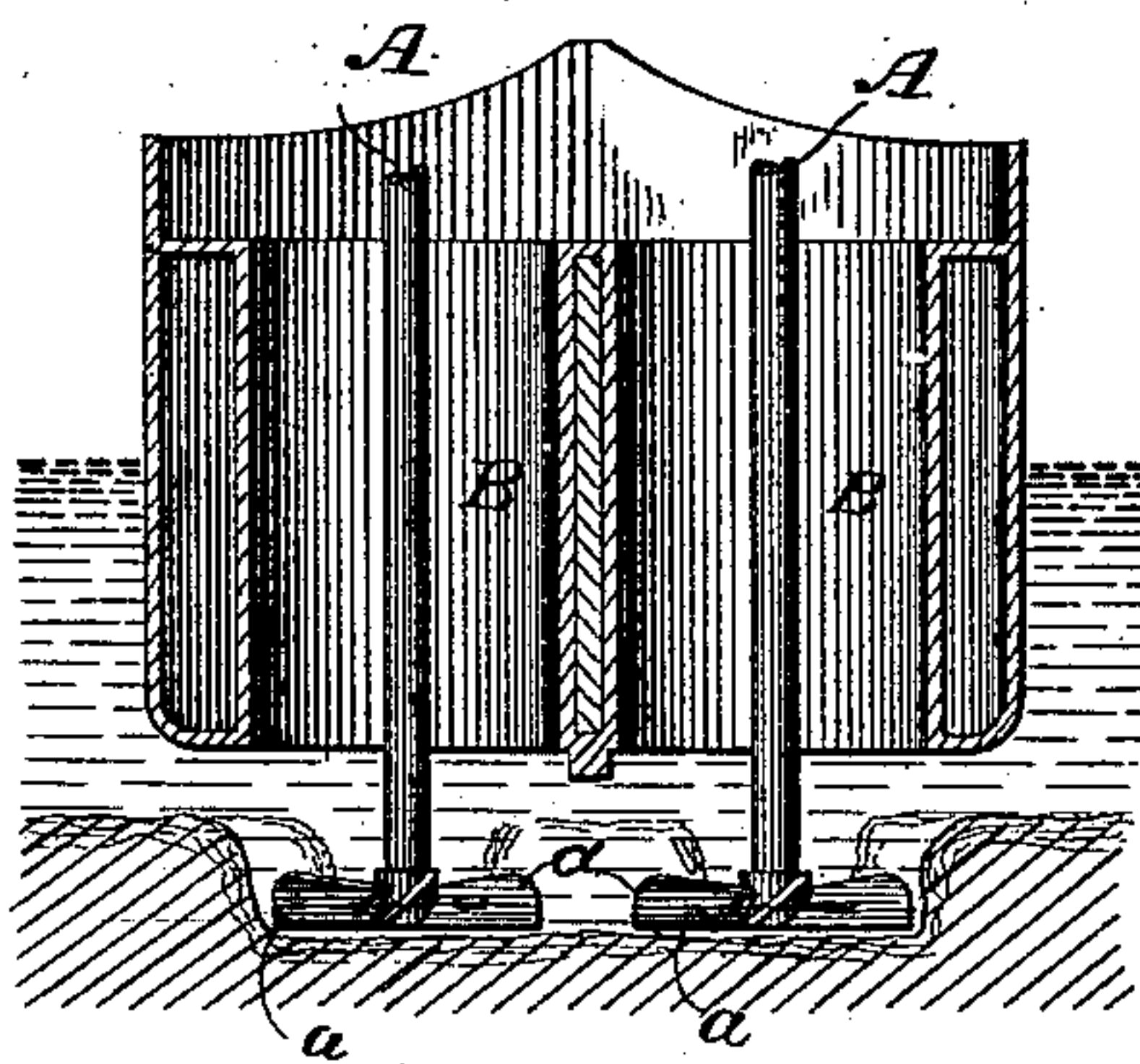
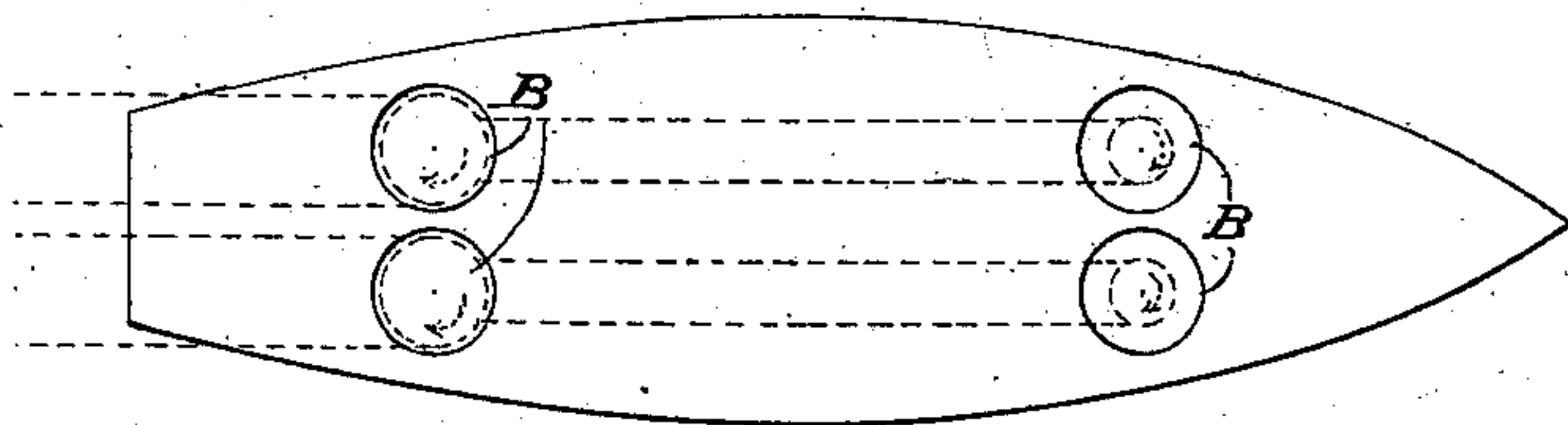


Fig. 6.



WITNESSES

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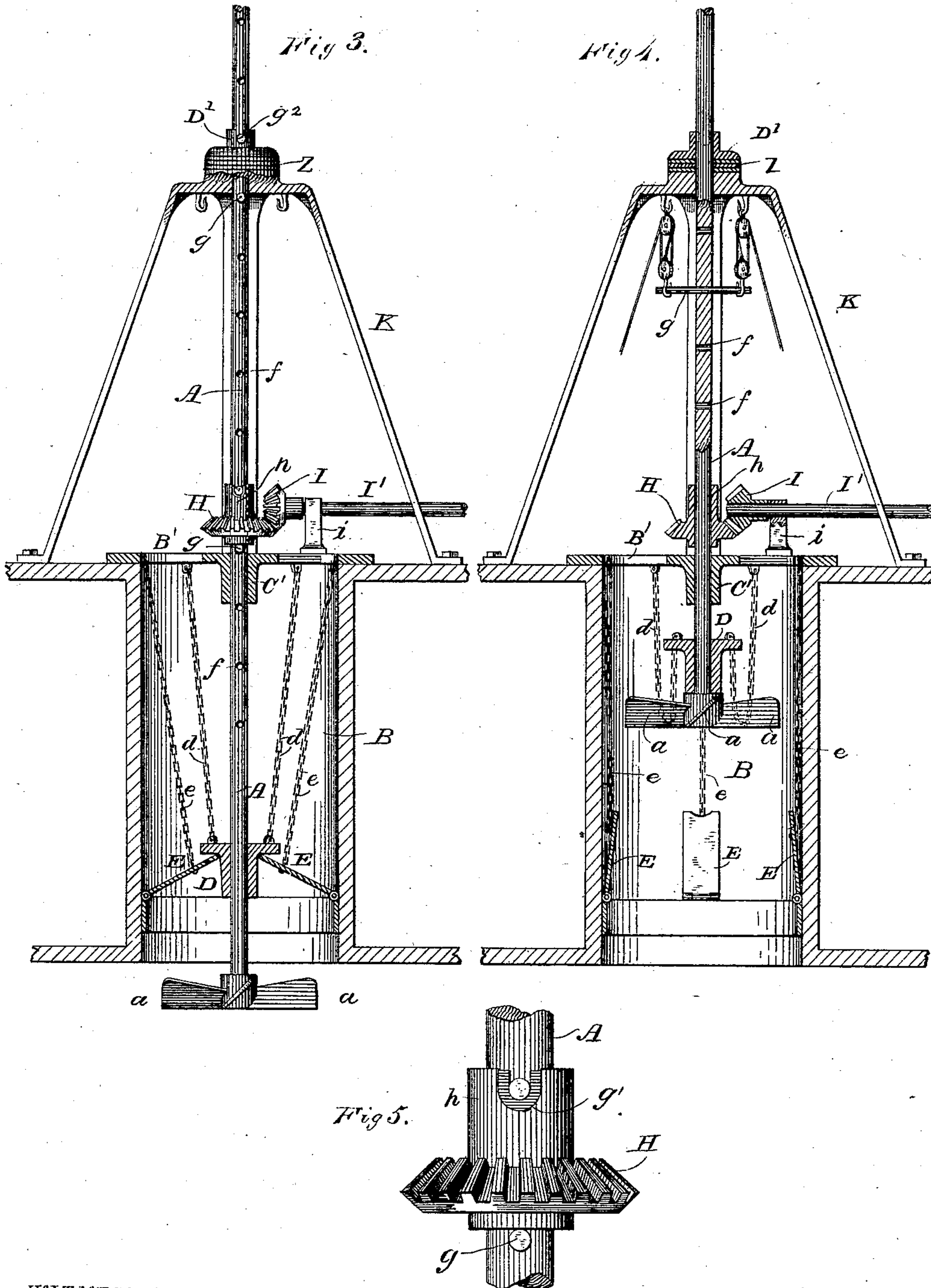
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOHN F. SPEARING, OF NEW ORLEANS, LOUISIANA.

MEANS FOR DEEPENING THE CHANNELS OF RIVERS, &c.

SPECIFICATION forming part of Letters Patent No. 275,534, dated April 10, 1883.

Application filed September 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. SPEARING, of New Orleans, in the State of Louisiana, have invented an Improved Means for Deepening the Channels of Rivers, Removing Bars, &c., of which the following is a specification.

Owing to the constant deposit of sediment in channels of rivers and at their outlets, it has become an imperative necessity to provide some way of clearing such deposits away, and various means have been introduced, all of which are more or less effective, but are slow and expensive.

The object of my invention is to provide an improved organization, involving a vessel carrying suitable cutters, which will cut up the bed of the channel, or cut a way through a bar and thoroughly stir up the deposit loosened by the cutters, so that it will be carried out of the way by the current or tide.

In the accompanying drawings, Figure 1 is a longitudinal section through a vessel provided with my apparatus, the parts being merely indicated and broken away. Fig. 2 is a similar view of a transverse section. Fig. 3 is a detail view, showing one of the cutters lowered for work. Fig. 4 is a similar view, showing one of the cutters elevated above the water-line. Fig. 5 is a detailed view of one of the cutter-shafts, with the driving-hub and gear thereon; and Fig. 6 is a diagrammatic plan view, merely indicating the relative positions of the cutters, the tracks they cut being indicated by dotted lines.

As shown in the drawings, I prefer to employ two sets of cutters, one being forward and the other abaft the center of the vessel. The two leading cutters are placed on opposite sides of the keel or longitudinal center of the vessel, and the rear ones are similarly placed, so as to follow at or about in the track of the first pair. As illustrated more especially in Figs. 1 and 6, the forward cutters are smaller in diameter than the rear ones, so that as the vessel moves along at work the leading cutters will cut out a small channel, and the rear cutters, following in the same line, will enlarge it. The cutters are carried upon vertically-adjustable shafts, which turn in bearings in wells built in the hull of the vessel, so that the depth of cut may be regulated, and the cutters lifted

up into the wells entirely above the water-line for repair, or raised within the line of the hull when the vessel is moving from place to place. It may be found desirable in operation to adjust just the rear cutters to cut deeper than the forward ones. The means for adjusting them will presently be described.

Cutters of any suitable character may be employed; but I prefer, as shown in the drawings, a cutter consisting of radially-projecting blades *a*, secured on the end of the rotating vertically-adjustable shaft *A*.

It will be observed that the cutting-blades are inclined somewhat to the vertical plane of the shaft *A*; or, in other words, the planes or faces of the blades are at an angle to the axis of the cutter-shaft, so that when in operation the cutters are rotated in the direction of the arrows. The blades will not only cut the earth, but will stir it and throw it upward into the water, so that it will be exposed to the full power of the current or tide and carried off out of the way. A vessel thus equipped and driven by any suitable power, by traveling back and forth and by adjusting the depth of the cut, may open a channel of any desired width and depth, the matter thrown up by the cutters being carried off by the current and deposited at some unobjectionable point.

I will now describe the special organization of the adjusting mechanism, but first remark that the broad principle of my invention is not dependent upon the details shown, although the organization illustrated is deemed to be practical and efficient and well adapted to carry out the invention.

A water-tight well, *B*, is built in the hull for the accommodation of each cutter-shaft *A*. At the upper or deck end of the well a bearing, *C*, is provided, in which the vertical shaft *A* rotates. This bearing consists of a hub stayed by strong radial beams *B'*, so as to form an open support, cover, or spider. The lower bearing of the shaft consists of a hub, *D*, formed of a heavy piece of metal, and moving loosely up and down on the shaft. This hub is suspended from the beams *B'* by chains *d*, so that it may be raised and lowered. The hub is sustained centrally within the well, so as to afford a firm bearing for the shaft, by radial stays or supports *E*, which are also formed

of heavy metal, and are strongly hinged to the edge or wall of the well, and supported from the timbers B' by chains *c*. When the shaft is lowered for operation, the stays E embrace the hub D, as indicated in Fig. 3, holding it firmly, so as to afford a solid bearing for the shaft. The shaft A is provided with a series of apertures, *f*, through which pins or bolts *g* pass. The bevel-gear H on the shaft A is provided with an elongated hub, *h*, having notches therein, in which one of the pins or bolts *g* rests, the hub being held up against the pin by the pin *g* at the bottom of the gear. This hub and gear H is loose on the shaft A, so that by removing the pins the shaft may be adjusted to any height desired. The shaft is driven by the pin *g* which rests in the notch in the hub; and in order to prevent sudden shocks and strains of the apparatus I provide an elastic packing, *g'*, in the notch in the hub. The gear H is driven by a corresponding pinion, I, on the power-driven shaft I', which turns in suitable bearings. The bearing *i* shown may be either mounted on one of the timbers B' or on the deck of the vessel.

Above the well I provide an upright skeleton frame, K, having a bearing at the top, through which the shaft A passes. A notched hub, D', similar to that already described, is provided on the shaft above the frame, and any suitable number of anti-friction washers, *l*, may be interposed between the frame and the hub. The cross-pin *g*², resting in the notch of the hub, supports the entire weight of the shaft upon the frame, as will be well understood. The shaft may be elevated by means of a block and tackle hung on the frame, and connected with one of the cross-pins of the shaft A, as illustrated in Fig. 4.

As will be observed, the hub D' is placed high enough in the well to leave sufficient room to permit the raising of the cutter into the well within the line of the bottom of the vessel without moving the hub when the vessel is moving from place to place or is returning against the tide. When the cutter is to be so elevated, the pins *g*, which hold the gear H and its hub, are withdrawn, the shaft elevated by the block and tackle by any suitable power, and sustained in its elevated position by shifting the supporting-pin *g'*, which rests in the notched hub D'. The gear H, in any adjustment of the shaft, may be secured between any two of the holes in the shaft by the pins *g* to suit any required depth of cut.

When it is desired to elevate the cutter above the water-line for repair, the hub D is

drawn up so as to permit the stays E to be raised out of the way by the chains *c*. The shaft and cutter may then be elevated and sustained, as above described.

Of course the details above described may be changed in a variety of ways without departing from the essential principles of my invention.

Instead of forming the spider or open frame at the top of the well of an independent hub, C, and braces B', it might be made of metal and cast in a solid piece.

What I claim as my invention is—

1. The combination, substantially as set forth, of the vessel having the well built therein, the vertical cutter-shaft passing through the well, its bearings, the movable stays or supports sustaining the lower bearing of the shaft, and mechanism for raising the shaft and its cutter into the well above the stays, for the purpose set forth.

2. The combination of the vessel having the well built therein, the upright vertically-adjustable cutter-shaft, the movable collar or hub which forms its lower bearing, and the movable stays which sustain said bearing, substantially as set forth.

3. The combination, substantially as set forth, of the vessel, the forward well or wells, the rear well or wells, cutters or stirrers carried in the wells on upright vertically-adjustable shafts, and mechanism for raising and lowering both sets of cutters, so that they may be set to act at a greater or less depth, for the purpose set forth.

4. The combination, as set forth, of the vessel, front and rear rotary cutters carried on downwardly-extending shafts, the forward cutters being arranged to cut a smaller or narrower track than the rear ones, and mechanism for adjusting the cutters, for the purpose set forth.

5. The combination, substantially as set forth, of the vessel, a well or compartment built in the body of the vessel, a vertical rotary shaft carried in the well, a cutter or stirrer on the lower end of the shaft, and mechanism for raising the cutter up into the well or compartment above the line of the hull or bottom of the vessel.

In testimony whereof I have hereunto subscribed my name.

JOHN F. SPEARING.

Witnesses:

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A. S. PERKINS.