

(No Model.)

3 Sheets—Sheet 1.

J. D. COOPER.
DEVICE FOR RAISING SHIPS.

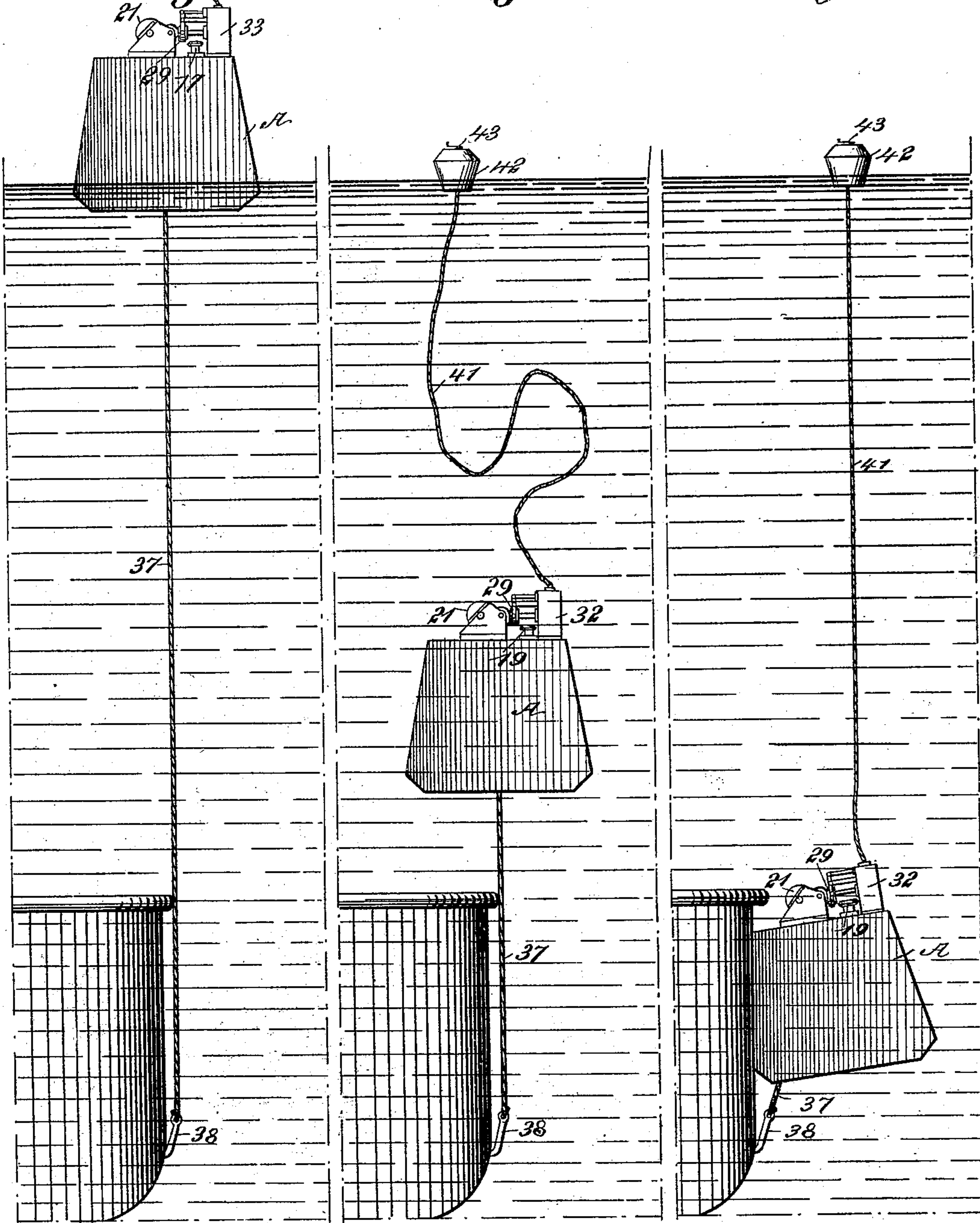
No. 549,493.

Patented Nov. 12, 1895.

Fig. 1

Fig. 2

Fig. 3



WITNESSES:

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Frederick A. Sargent

INVENTOR

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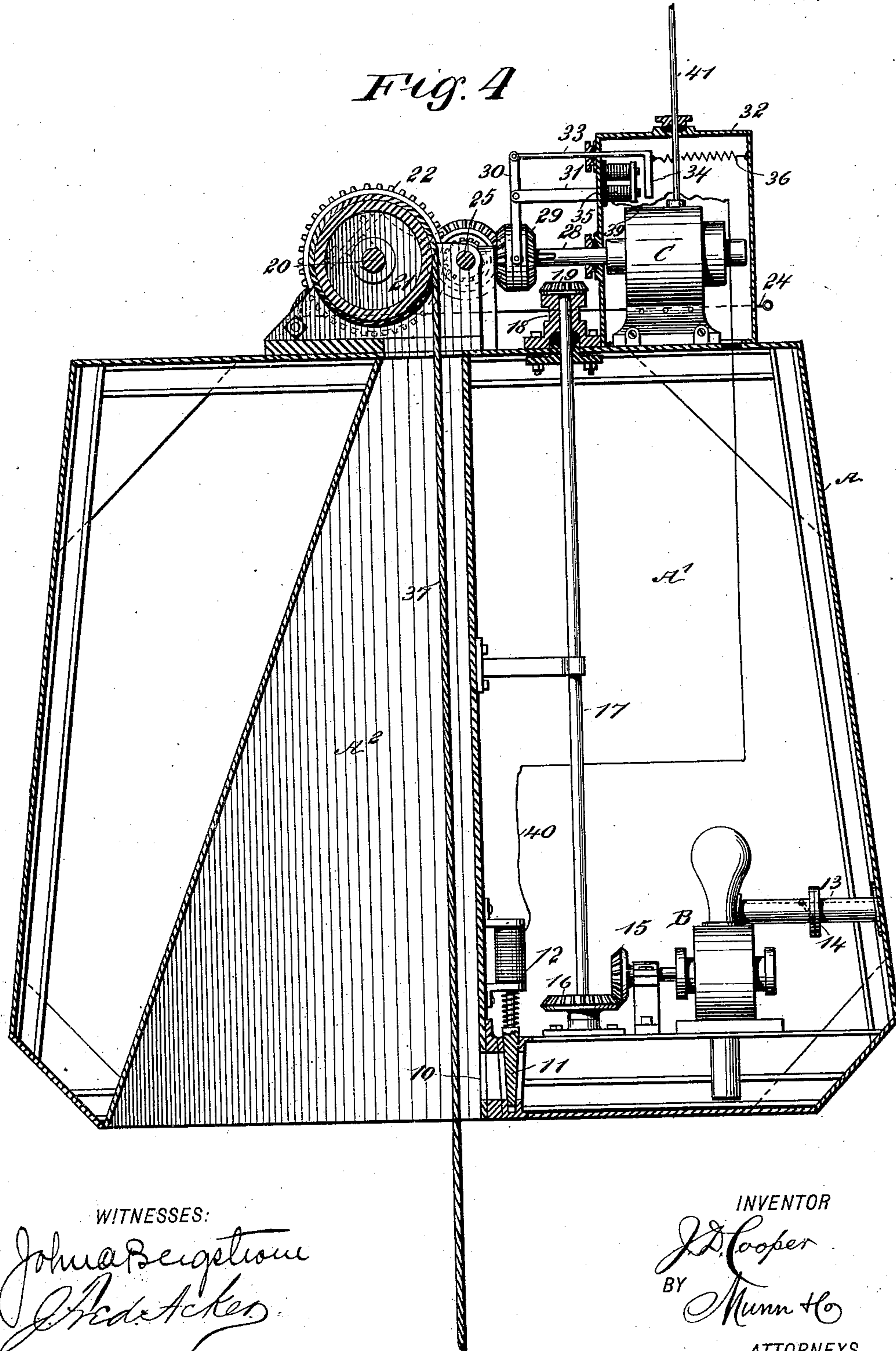
(No Model.)

3 Sheets—Sheet 2.

J. D. COOPER.
DEVICE FOR RAISING SHIPS.

No. 549,493.

Patented Nov. 12, 1895.



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(No Model.)

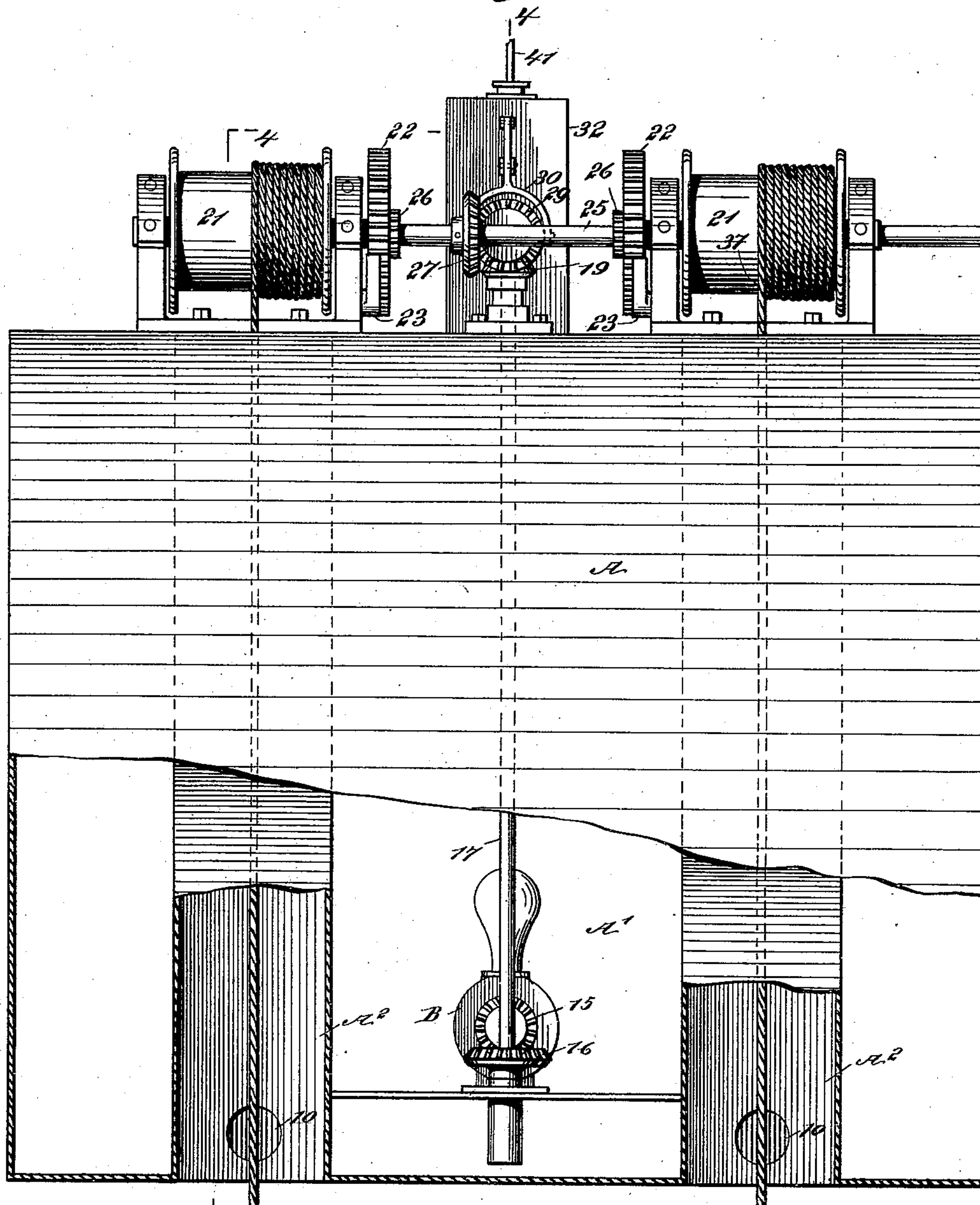
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Fig. 5



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UNITED STATES PATENT OFFICE.

JOHN DAVID COOPER, OF CHEBOYGAN, MICHIGAN.

DEVICE FOR RAISING SHIPS.

SPECIFICATION forming part of Letters Patent No. 549,493, dated November 12, 1895.

Application filed December 12, 1894. Serial No. 531,542. (No model.)

To all whom it may concern:

Be it known that I, JOHN DAVID COOPER, of Cheboygan, in the county of Cheboygan and State of Michigan, have invented a new and Improved Device for Raising Vessels, of which the following is a full, clear, and exact description.

My invention relates to an improvement in devices for raising vessels; and it has for its object to provide a means whereby pontoons may be employed for attachment to a sunken hull, the pontoons lowered to the vessel, emptied of the contents employed in lowering them, and utilized for floating or raising the hull to the surface, the mechanism on the ponton employed for emptying its contents and likewise for lowering it and for filling it being electrically controlled from any suitable vessel on the surface of the water.

Another object of the invention is to provide a means whereby a number of floats may be located upon the surface, each float being connected with a ponton, and whereby all of the floats may be connected with a dynamo or other source of electric supply located upon said vessel.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of one of the pontoons located on the surface of the water and connected with a sunken hull. Fig. 2 is a view similar to Fig. 1, the ponton being illustrated as being sunken and approaching the vessel's hull. Fig. 3 is a like illustration, in which the ponton is illustrated as alongside of the hull and in position to assist in raising the same. Fig. 4 is an enlarged sectional view of the ponton, said section being taken substantially on the line 4 4 of Fig. 5; and Fig. 5 is a side elevation of the ponton, partially in section.

In carrying out the invention the ponton A may be constructed of any desired material and may be of any desired shape. In the drawings it is illustrated as being con-

structed with inclined sides, being larger at the base than at the top. The ponton is provided with an interior chamber A' and with one or more, preferably two, passage-ways A², extending through it from top to bottom, as shown in Figs. 4 and 5, and preferably one wall of these passage-ways is straight, while the opposing wall is more or less inclined. In fact the passage-ways are made wider at the bottom than at the top. Each passage-way is provided with an opening 10, located, preferably, at or near the bottom of the ponton, being in communication with the interior chamber A'. Each of these openings 10 is normally closed by a gate-valve 11 or the equivalent thereof, the said valves being electrically controlled, and in the drawings each valve is shown as being operated through the medium of a solenoid-magnet 12.

Within the chamber A' of the ponton a pump B is located at any desired point, the outlet-pipe 13 whereof extends through the outer wall of the ponton and is provided with a suitable check-valve 14. This pump is adapted to expel the water from the chamber A', which water is employed to add weight to the ponton in order that it may the more readily be sunken below the surface of the water. The piston of the pump-cylinder is provided with a gear 15, which is made to mesh with a gear 16, secured upon a vertical shaft 17, which is carried upward through the top of the ponton and through a suitable gland 18 at the top to prevent water other than that entering through the ports or openings 10 gaining access to the said chamber, and the said shaft 17 is provided with a beveled gear 19 at its upper end, as shown in Figs. 4 and 5.

Over the top of each channel A² in the ponton a drum-shaft 20 is journaled in any suitable or approved bearings, a drum 21 being secured upon each of the said shafts, and each drum-shaft is provided with a gear 22, and the teeth of the gear of each drum-shaft are engaged by a pawl 23, so that the gears 22 act also in the capacity of ratchets, and each pawl may be carried out of engagement with the teeth of the wheel 22 to which it belongs by means of a shifting-rod 24 (see Fig. 4) attached to it, or by equivalent mechanism. The drum-shafts are all driven from a

single line-shaft 25, and to that end the line-shaft is provided with pinions 26, meshing with the gears 22, and the line-shaft is further provided with a beveled gear 27 at or near its center. The line-shaft is preferably driven through the medium of an electric motor C, and the driving-shaft 28 of this motor is provided with a double-faced gear 29, having sliding movement thereon, yet held to turn therewith. The double-faced gear 29, which may be termed a "shifting gear," is pivotally connected with an arm 30, and this arm is fulcrumed upon a bracket 31, projected usually from a casing 32, which is made to surround the motor in order to preserve it from the action of the weather and from the water, since the ponton, as heretofore stated, is to be sunken below the surface of the water.

At the upper end of the shifting arm 30 a rod 33 is pivotally attached, which is held to slide through a suitably-packed opening in the casing, and the said rod 33 carries at its inner end and within the casing, an armature 34, adapted to be attracted by a magnet 35, likewise located in the said casing, as shown in Fig. 4, the armature being normally held out of engagement with the magnet through the medium of a spring 36 or its equivalent, and when the armature is in this position the shifting gear will be in mesh with the gear 27 of the line-shaft. Consequently when the motor is started the drums will be actuated. Each drum has normally coiled upon it a chain or cable 37, and these chains or cables extend through the channels A² in the pontons and have suitable grapplings 38 secured upon their lower ends.

The wire 39 from the magnet 35, likewise the wire from the motor and the wire 40 from the solenoid magnet 12 in the ponton, are suitably protected and are carried upward in a group in the shape of a cable 41 to, for instance, a float 42, containing a suitable switch 43, and these floats are in circuit connection with a dynamo or other source of electrical supply upon a vessel accompanying the pontons.

In the operation of this device any desired number of pontons are employed. When floating upon the surface of the water, the gates 11 are raised by turning the current on to the solenoid magnets, and the compartments A' in the pontons are immediately filled with water, and even when the pontons are so filled they will yet be buoyant and will float in a measure. The various cables 37 are previously carried downward by the diver or other person employed for that purpose and are fastened to the vessel's hull, as shown in Fig. 1, the cables being left free to unwind from their drums 21. The current is then turned on to the motors C, and said motors being normally in gear with the line-shaft 29 of the pontons will cause the drums to turn in such a manner as to wind the cables 37 thereon, and consequently the pontons will

be drawn down below the surface of the water, as shown in Fig. 2, until they have been brought alongside the hull, as shown in Fig. 3, the floats 42 remaining on the surface of the water, and the pawls 23 will so lock the drums as to prevent the pontons from shifting or leaving their positions. It will be observed that the ponton is lowered by exerting from it an upward drag on the cable, which is secured to the sunken hull. The current is then taken off the electric apparatus controlling the gates 11, and the gates will be closed through the medium of a spring or other means brought under tension when they are raised. Consequently the ports 10 will then be closed. The current is now turned on to the magnets in the casing 32 at the top of the pontons, and said magnets by attracting the armatures 34 will cause the shifting double gear 29 to be carried from engagement with the driving-gear of the line-shaft 25 and to an engagement with the driving-gear 19 of the vertical or pump shaft 17, and said shaft upon being revolved, will start the pumps B in operation, which pumps will empty the chambers A' of the pontons, removing whatever water they may contain, and the pontons being thus lightened will float the hull to the surface of the water.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a device for raising vessels, a submersible ponton, a cable extending therefrom and adapted for connection with the vessel to be raised, means for filling the ponton with water and for expelling the water therefrom, and a lowering device located on the ponton and engaging the cable to exert an upward drag thereon and thereby sink the ponton, substantially as described.

2. In a device for raising vessels, a submersible ponton, a cable extending therefrom and adapted for connection with the vessel to be raised, means for filling the ponton with water and for expelling the water therefrom and a windlass carried by the ponton and on which is adapted to wind the said cable to sink the ponton by an upward drag on the cable, substantially as described.

3. In a device for raising sunken vessels or objects, a ponton provided with means for filling the same with water and a pump for expelling the water therefrom, a windlass carried by the ponton, cables attached to the windlass and extending through the ponton, adapted for attachment to the latter, detent mechanisms connected with the windlass, a motor, means, substantially as shown and described, for driving the windlass or the drive shaft of the pump from said motor, and a mechanism for controlling the ports through which the ponton is supplied with water, and for the purpose specified.

4. In a device for raising sunken vessels or objects, a ponton having walled openings extending through it, windlasses located above

said openings, provided with detent mechanisms and cables extending from the windlasses through the openings in the ponton, being adapted for engagement with the object to be raised, said ponton being also provided with inlet openings adapted to admit water, gates electrically controlled normally, closing said openings or ports, a shifting gear, a pump located within the ponton and adapted to expel water therefrom, a motor, a shifting mechanism carried by the said motor, adapted for driving connection with the windlasses and the drive shaft of the pump, and means, substantially as shown and described, for electrically controlling the said shifting mechanism, as and for the purpose set forth.

5. In a device for raising sunken vessels or objects, a ponton having walled openings extending through it, windlasses located above said openings, provided with detent mechanisms and cables extending from the windlasses through the openings in the ponton, being adapted for attachment to the object to be raised, the said ponton being also provided with inlet openings adapted to admit water, gates electrically-controlled normally closing said openings or ports, a shifting gear, a pump located within the ponton and adapted to expel water therefrom, a motor, a shifting mechanism carried by said motor, adapted for driving connection with the windlasses and the drive shaft of the pump, means, substantially as shown and described, for electrically controlling the said shifting mechanism, a float provided with an electric switch

and adapted for connection with the source of electrical supply, and wires connected with the shifting mechanism and operative mechanisms of the gates, carried to the float and the switch thereof, as and for the purpose specified.

6. In a device for raising sunken vessels and objects, the combination, with a ponton provided with an interior chamber and walled channels extending through the same from top to bottom, ports leading from the walled channels into the said chamber, gates normally closing the said ports and electrically operated, and a pump located within the ponton chamber, adapted to force water therefrom, the said pump being provided with a drive shaft extending through the upper portion of the ponton, of a windlass provided with a detent mechanism, located over each channel in the ponton, a cable attached to each windlass and extending downward through the channels, being adapted for engagement with the vessel to be raised, an electric motor, a line shaft in communication with the windlasses, an electrically operated shifting gear adapted for driving connection either with the line shaft or the pump shaft, the wires from the mechanism controlling the shifting gear, the motor and the mechanism controlling the gates being connected with an object adapted to float on the surface of the water, as and for the purpose set forth.

JOHN DAVID COOPER.

Witnesses:

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HENRY J. A. LADD.