(No Model.)

3 Sheets—Sheet 1.

J. W. POWERS.

BALLOON FOR WRECKING PURPOSES.

No. 284,667. Patented Sept. 11, 1883.

Fig. 1.

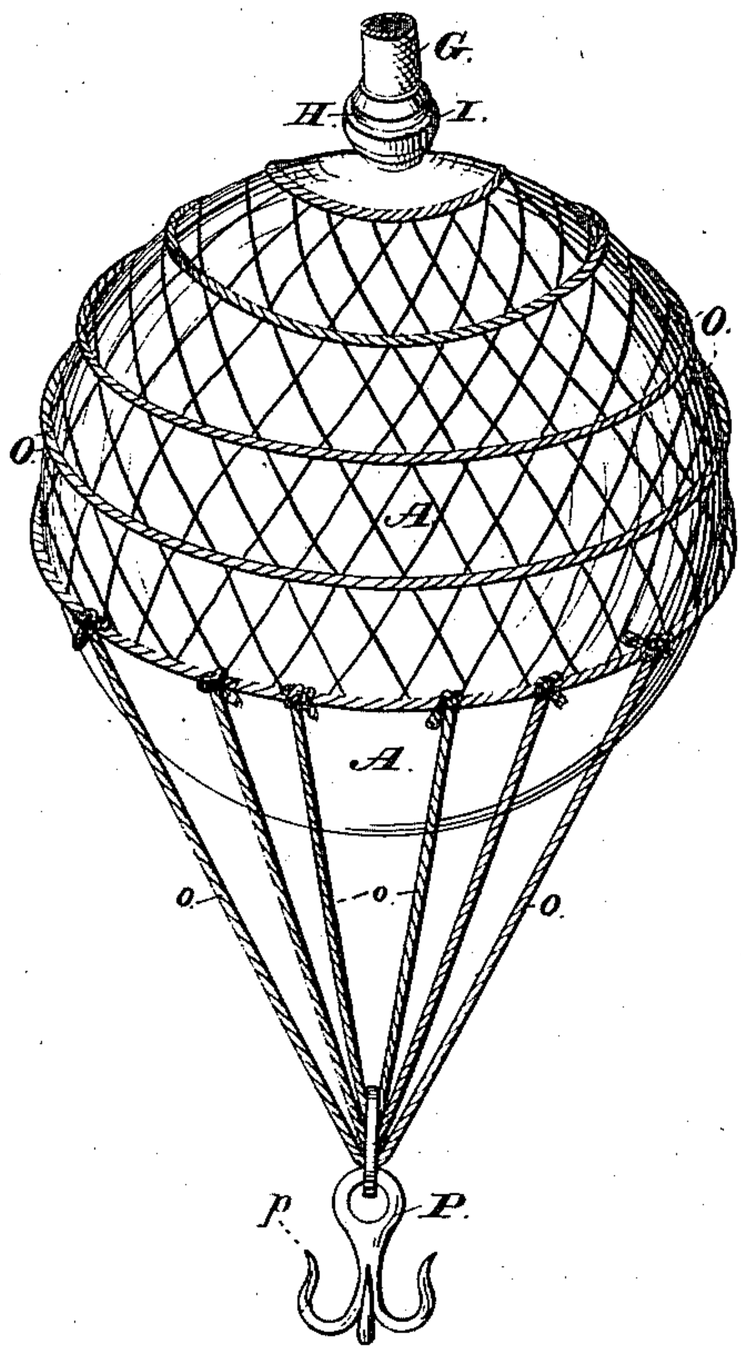


Fig. 2.

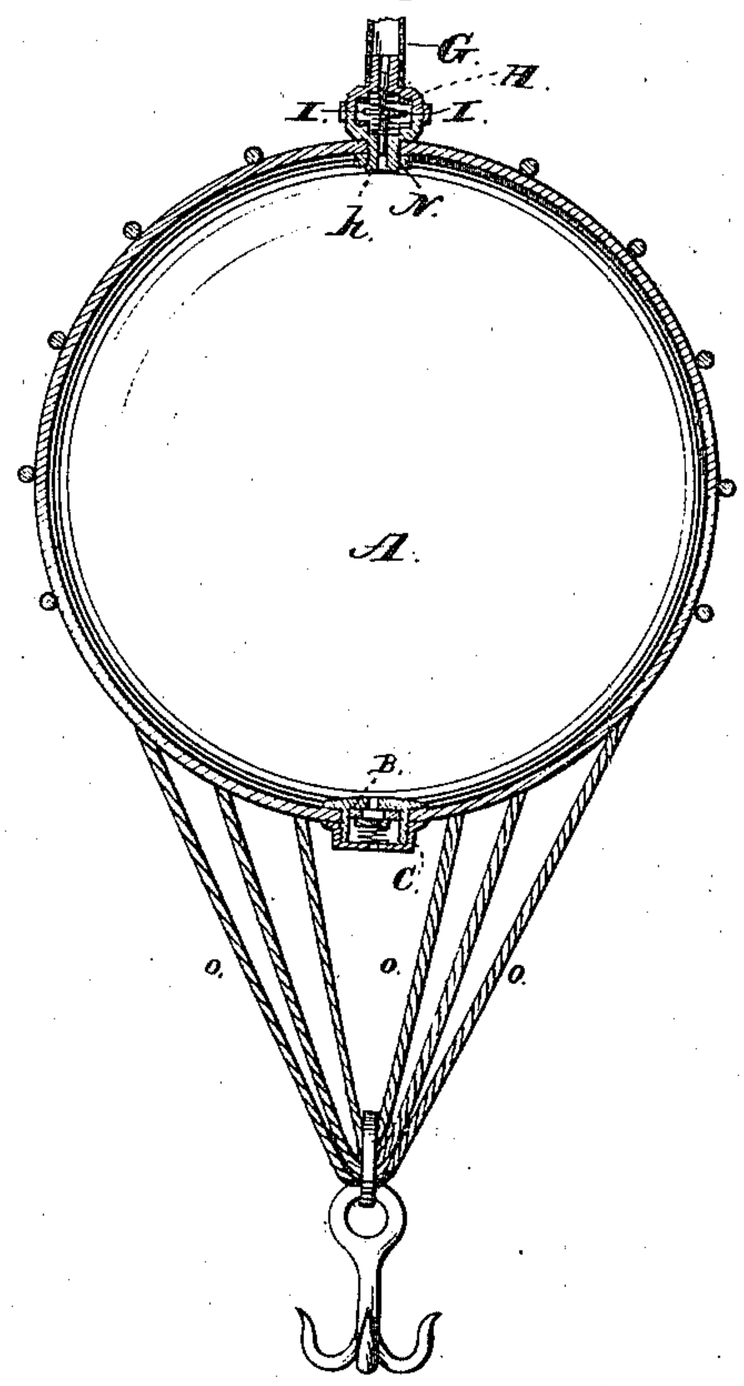


Fig. 4.

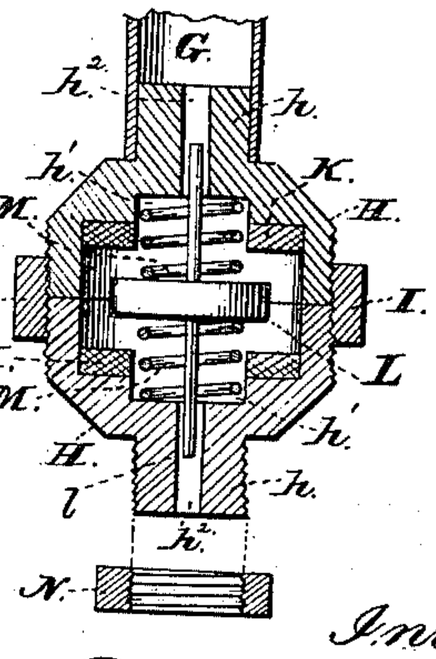
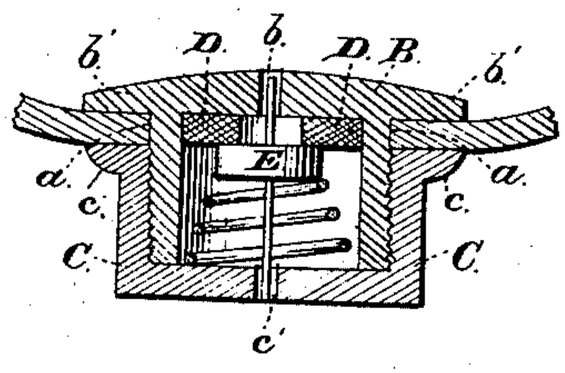


Fig. 3.



Witnesses.

Jas. E. Hutchinson.

Henry C. Hazard.

Inventor.

Jay W. Powers, by

Geo. S. Prindle, his Atty

(No Model.)

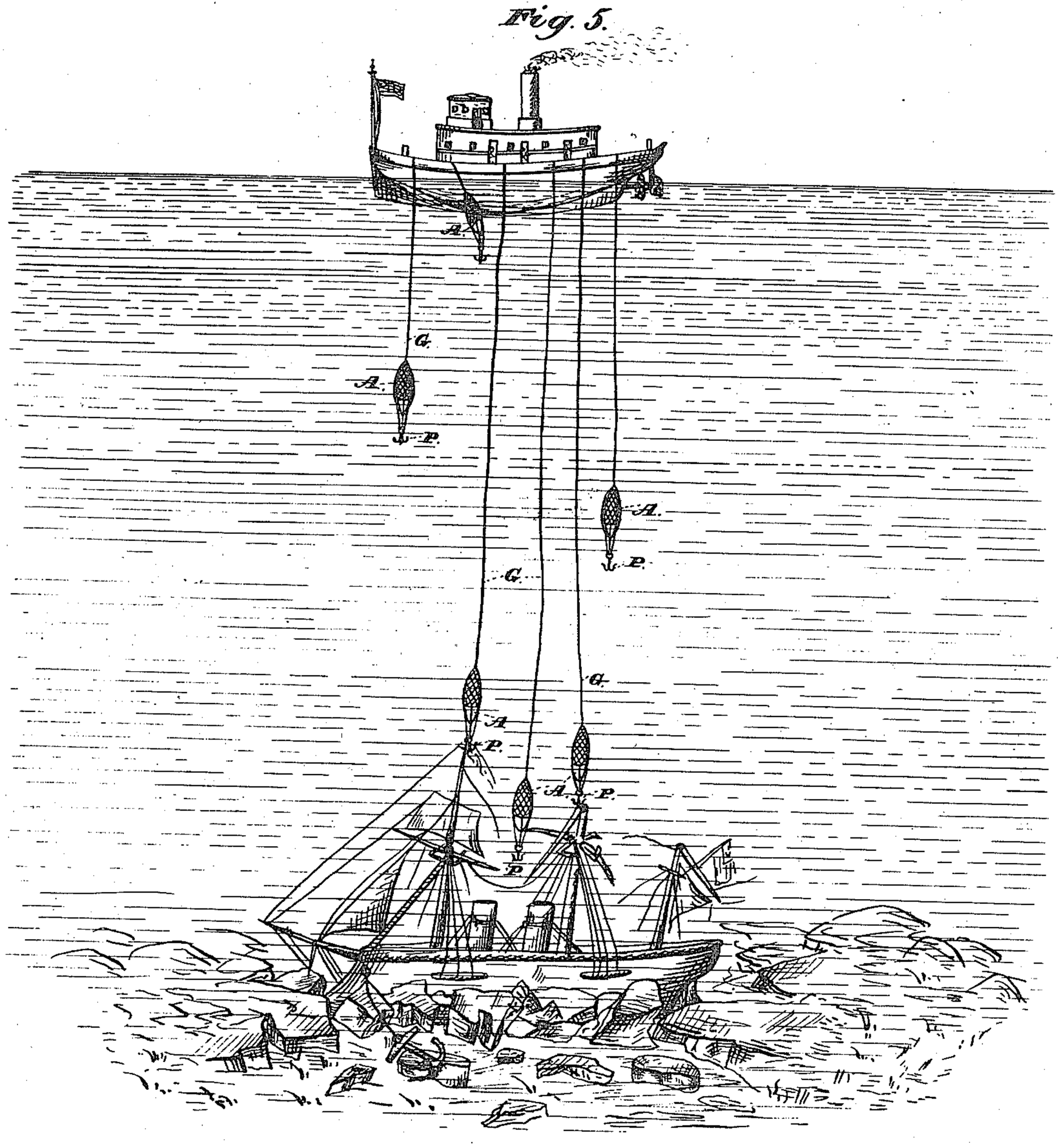
3 Sheets—Sheet 2.

J. W. POWERS.

BALLOON FOR WRECKING PURPOSES.

No. 284,667. Patented Sept. 11, 1883.

Fig. 5.



Witnesses.

Jas. E. Hutchinson.

Henry C. Hazard.

Inventor.

Jay W. Powers, by

Geo. S. Grindle, his Atty

(No Model.)

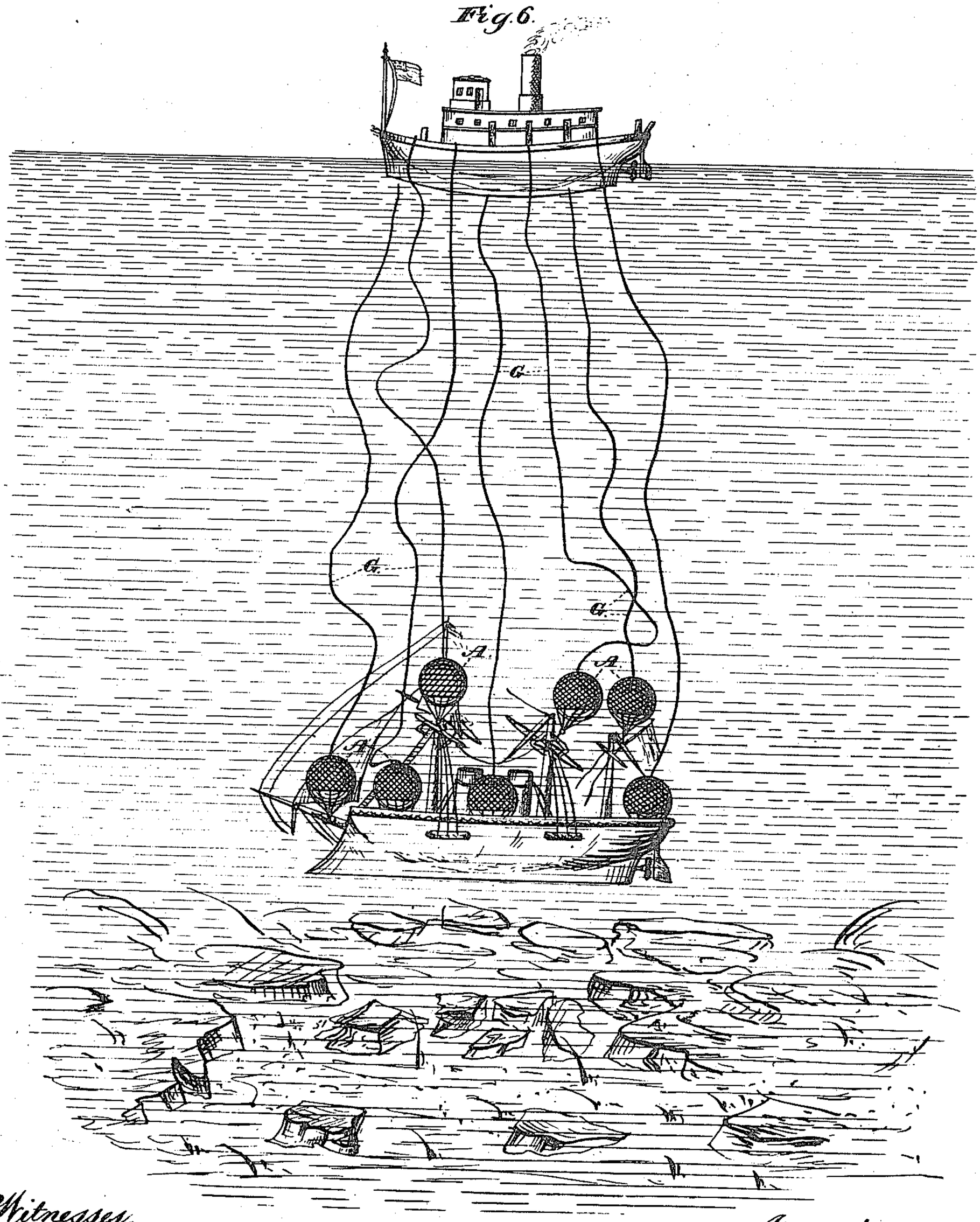
3 Sheets—Sheet 3.

J. W. POWERS.

BALLOON FOR WRECKING PURPOSES.

No. 284,667. Patented Sept. 11, 1883.

Fig. 6.



Witnesses.
Jas. E. Hutchinson.
Henry C. Hazard.

Inventor.
Jay W. Powers. by
Geo. S. Grindle, his Attj

UNITED STATES PATENT OFFICE.

JAY W. POWERS, OF CHICAGO, ILLINOIS.

BALLOON FOR WRECKING PURPOSES.

SPECIFICATION forming part of Letters Patent No. 284,667, dated September 11, 1883.

Application filed December 22, 1880. (No model.)

To all whom it may concern:

Be it known that I, JAY W. POWERS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Submarine Balloons for Wrecking, and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my balloon or float inflated and ready for use. Fig. 2 is a vertical central section of the same. Figs. 3 and 4 are, respectively, enlarged central sections of the safety and inlet valves employed. Fig. 5 is a perspective view of my apparatus as being connected to or with a sunken vessel, and Fig. 6 is a like view of the same with the balloons or floats inflated and the vessel lifted from the ground.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to enable sunken vessels to be easily and quickly raised; and to this end it consists in an improvement in apparatus for raising sunken vessels in a collapsible balloon or float, provided within its inlet with a double-acting valve which will close against a sudden increase of pressure within the air-supply tube, and against the egress of air from the float, substantially as and for the purpose hereinafter specified.

In the annexed drawings, A represents a float or balloon, constructed of or from flexible material which is impervious to air, and having, preferably, a spherical form.

Within the lower side of the float A is an opening, *a*, within which is placed an escape or safety valve that is constructed and applied in the following manner, viz: Passing outward through the opening *a* is a cup-shaped casing, B, which is open at its outer end and closed at its inner end, except a small opening, *b*, at the axial center of the latter. A radial flange, *b'*, at said inner end extends over the inner face of the contiguous material which composes the walls of said float. The periphery of the casing B is threaded, and over the same is fitted an interiorly-threaded cup, C, which, at its inner end, is provided with a radial flange, *c*, that extends outward over the outer face of the wall of the float A to a point corresponding to the outer line of the flange *b'*, the flexible material composing said float being compressed between said flanges, so as to produce at such point an air-tight joint. The outer end of said cap C is closed except at its center, where is provided an opening, *c'*, which corresponds in size to the size of the opening *b*.

Within the bottom of the casing B, surrounding the opening *b*, is placed an annular disk, D, composed, preferably, of rubber or other elastic material, which operates as a seat for a valve, E, that bears thereon, and is held firmly in place by means of a spiral-spring, F, which extends between the outer side of said valve and the end of the cup C, the pressure of said spring being sufficient to hold said valve closed against the air-pressure, which it is intended shall be applied to said float.

At the upper end of the float A is provided an air-supply pipe, G, and interposed between which parts is an air-regulating valve constructed as follows, viz: A casing, H, formed in two parts, which are threaded exteriorly and secured together by means of an interiorly-threaded ring, I, that fits upon each at their junction, is provided at each end with a neck, *h*, and within its central part has a cylindrical chamber, *h'*, that has the same axis as said necks, and at each end connects with an axial opening, h^2, that is provided in each of said necks.

At each end of the recess *h'* is provided an annular ring, K, of rubber, or other like elastic material, and between said rings, which are intended for valve-seats, is placed a valve, L, that has the form of a flat disk, and at each side is provided with a stem, *l*, that passes into and is contained within the openings h^2.

Between each side of the valve L and the contiguous end of the chamber *h'*, is placed a spiral spring, M, which springs operate to hold said valve centrally, so as to permit air to pass freely through the openings h^2 and through said chamber, around the edges of said valve.

In order that the springs M may be held centrally within the chamber *h'*, each end of the latter is recessed out, as shown in Fig. 4, and within such recess is contained one end of one of said springs. The casing H is secured

within the float A by passing the lower exteriorly-threaded neck *h* through a corresponding opening in said float and screwing upon said neck from within said float a nut, N, as shown in Fig. 2. To the upper neck *h* is attached the air-supply pipe G, which is composed of rubber, canvas, or other commonly-used flexible material.

Around the float A is placed a netting of cordage, O, from which depends several cords, *o*, that are connected with and support a grappling-hook, P, that has one or more prongs or hooks, *p*. The float is now complete, and, in connection with others of the same construction, is used as follows, viz: The air-supply pipe G of each float is connected with an air-pump or compressor, usually located upon a boat which is moored over the vessel to be raised, and said floats, in a collapsed condition, are lowered to and moved around said wrecked vessel until the grappling-hook P of each engages with some part of the same. After the floats have all been attached to the sunken vessel, as set forth, air is forced into them until they are expanded to their full size, when, if a sufficient number of floats have been provided, their buoyancy will exceed the weight of the vessel, and the latter will be raised from the ground and supported in the water.

The safety-valve at the lower end of each float will ordinarily prevent injury from excessive pressure of air, but in the event of any sudden increase of pressure within the supply-pipes, from the bursting of one or more floats or from other causes, the valve L, which has hitherto been balanced midway between the seats K, will close down upon the lower of said seats and prevent the entrance of more air to said float. In the event of injury to the supply-pipe G, the pressure of air within said float will cause said valve to close against its upper seat and prevent the escape of air.

In order to equalize the pressure of air within the floats, it may be desirable to connect a number of the same by means of pipes that extend from one to another, in which case a check-valve, similar to that described, must be placed at each end of such connecting-pipes, as well as at the lower end of each supply-pipe.

The apparatus described is adapted to raise not only vessels, but any heavy objects within water, and is capable of use in places where ordinary wrecking mechanism could not be employed.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

A collapsible balloon or float, provided within its air-inlet with a double-acting valve which will close against a sudden increase of pressure within the air-supply tube and against the egress of air from the float, substantially as and for the purpose shown.

In testimony whereof I hereunto set my hand this 6th day of November, A. D. 1880.

JAY W. POWERS.

Witnesses:
E. E. POWERS,
CHAS. F. WARD.