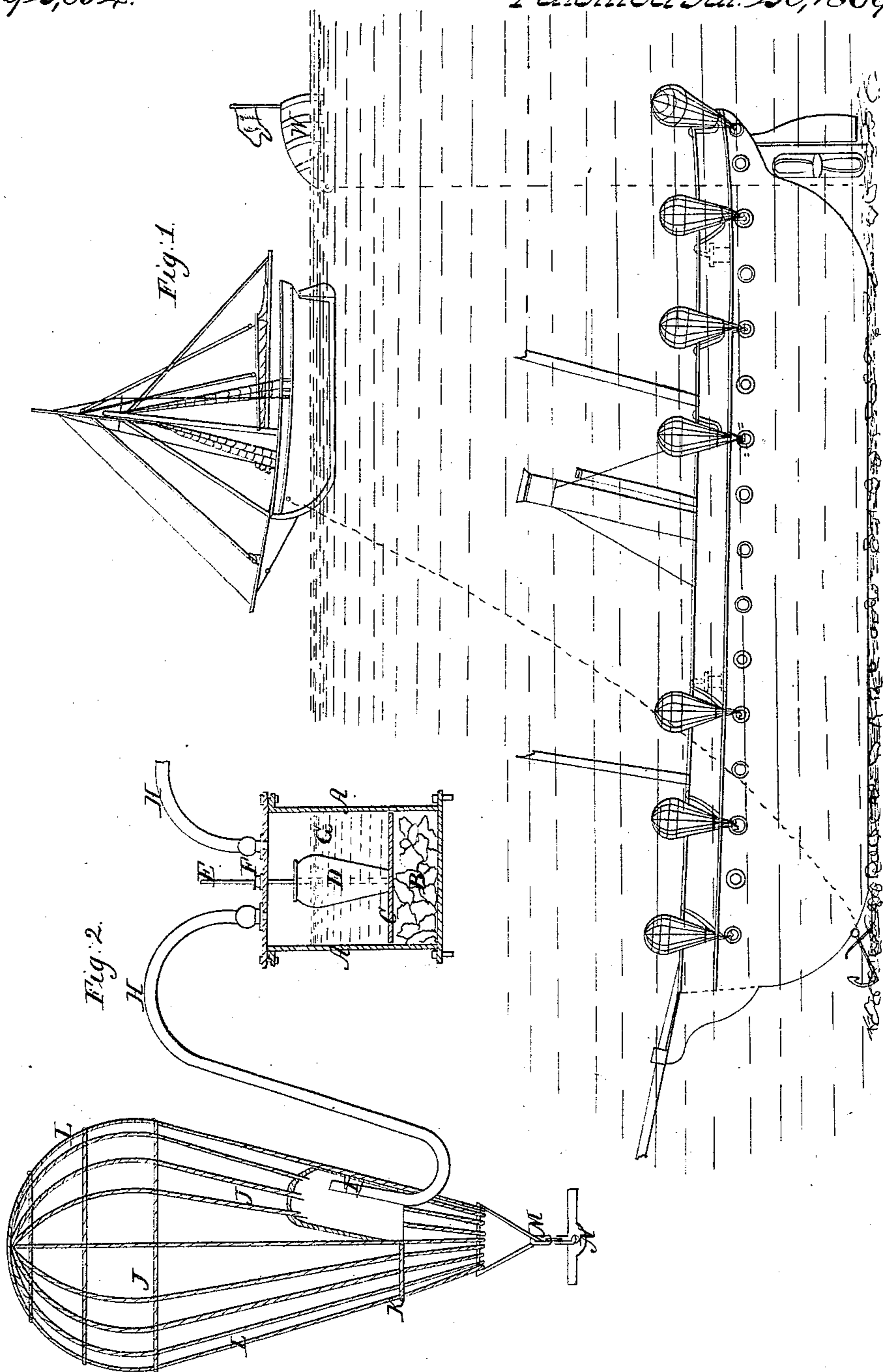


S. W. Maguay.
App's for Raising Sunken Vessels.
Nº 92,854. *Patented Jul 20, 1869.*



Witnesses
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SAMUEL WILLIAM MAQUAY, OF FOOTSCRAY, NEAR MELBOURNE, VICTORIA.

Letters Patent No. 92,854, dated July 20, 1869.

IMPROVED DEVICE FOR RAISING SUNKEN VESSELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SAMUEL WILLIAM MAQUAY, of Footscray, near Melbourne, in the British Colony of Victoria, electro-chemical plater and gilder, have invented "An Improved Method of Raising Sunken Vessels and Goods, and sustaining those which are afloat;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention has for its object the raising of sunken vessels or material, also sustaining those which are afloat.

For this purpose I employ hydrogen-gas, generated and applied in the manner and by the means hereinafter described.

Referring to the drawings hereto annexed—

Figure 1 shows a side view of a sunken vessel, with my generating-apparatus and some gas-receptacles or balloons affixed; and

Figure 2 shows view, partly in section and on a larger scale, of the generator and balloon.

A is the generator, in which is broken zinc B.

C is wooden shelf.

D is sulphuric-acid jar.

E is iron rod.

F is stuffing-box for same.

G. is height of water in generator.

H is gas-supply pipe.

I is strap, for holding same in position in gas-receptacle or balloon J.

K is the rope grommet, forming the open mouth of the balloon.

L is rope netting or casing, having links M and toggle N at its lower extremity.

The generator is made of cast-iron, having outward flanges around the top edge, made as shown, so as to receive an India-rubber washer, in order to form a water-tight joint when the top or cover is put on, and fastened to it by screws or otherwise. There are also several perforated tongues or lugs projecting from the lower edge, in order to permit of its being screwed down in any required place.

The pipe H must be flexible.

Above the stop-cock in the exit-pipe, to which this flexible tube is attached, there must be a valve opening upwards, for the purpose of preventing the water from entering into the generator when it is not under pressure.

The gas-receptacles, or balloons, should be flexible, and must be made of water-tight material. I propose to make them of three thicknesses of canvas or duck, each to have two coats of melted India rubber. I also propose to cut the material into a circular shape, say about twenty feet in diameter, and to pierce an eyelet-hole, at about the distance of a foot apart, around the circumference, at about two inches from the edge.

Through each of these eyelet-holes I pass a stout cord, and fasten them all to a circular rope grommet, about two and a half feet in diameter. Now, in order to relieve the water-proof material from the strain caused by the pressure of the gas, I construct a net-work of ropes, (as shown,) sufficiently strong to bear a considerable margin of strain beyond that to which it is likely to be subjected. These ropes all meet, and are fastened to one side of a triangle of round iron, to which are attached three strong links, with a toggle at the end.

When about to commence operations for raising a sunken vessel, I first charge the generators with a sufficient amount of broken zinc, and about an equal weight of sulphuric acid, in a jar.

I then place the iron rod in the acid-jar, fill in the requisite quantity of water, and fasten down the lid.

I then sink the generators, and fasten them in any convenient position on the deck of the vessel.

The gas-receptacles, with their rope net-work casings, are then sunk and fixed in position, the toggle being fixed, say inside the port-holes or dead-lights.

The end of the pipe is fastened to the strap, on the inside of each of the balloons, before being lowered, and I now attach the other extremity, by a coupling, to the end of the supply-exit in the generator.

All being now ready, the operator strikes the iron rods E, as nearly simultaneously as possible, so as to break the acid-jars, and permit of the generation of hydrogen-gas, which then passes through the pipes into the balloons.

As soon as the power of the gas exceeds the weight of the vessel and the strength of its adhesion to the bottom, the vessel will begin to rise, and as it rises, the water itself will act as a most perfect safety-valve for the balloons, permitting of the escape of the gas in precise proportion to the lessening of the pressure upon them by reason of their approach to the surface, and so preventing their being burst.

It will be noticed, in fig. 1 of the drawing, that I have only shown a sufficient number of generators and balloons to illustrate the method of operation. Their size, number, and method of attachment, must be regulated by the circumstances of each individual case.

It may be as well, perhaps, to state that I have found that generators of the size I have shown in my drawings, containing a hundred weight of acid, and a similar quantity, by weight, of broken zinc, will produce about eight hundred feet of gas, at a depth of seventy-two feet; but, of course, at a less depth it would produce a larger quantity, and of a less density. In any case, it requires about twenty-seven cubic feet of gas to raise one ton.

I may also state, that I have found it convenient to use one generator to three balloons, supplying them simultaneously by separate pipes, each connected to its own exit.

Of course, if the invention were to be applied to the purpose of sustaining vessels in the water, it is obvious how it would be applied, as the sunken vessel, risen to the surface, would show the method precisely.

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

1. The apparatus for producing hydrogen-gas under water, and conveying it to the gas-receivers or balloons, consisting of the case A, acid-jar D, rod E, and pipe H, substantially as specified.

2. The gas-generating apparatus herein described, in combination with the balloon H, provided with the link M and toggle N, as set forth, for the purpose specified.

The above specification of my invention signed by me, this day of , 1866.
SAMUEL WILLIAM MAQUAY.

Witnesses:

EDWARD WATERS,
JOHN ARTHUR.