

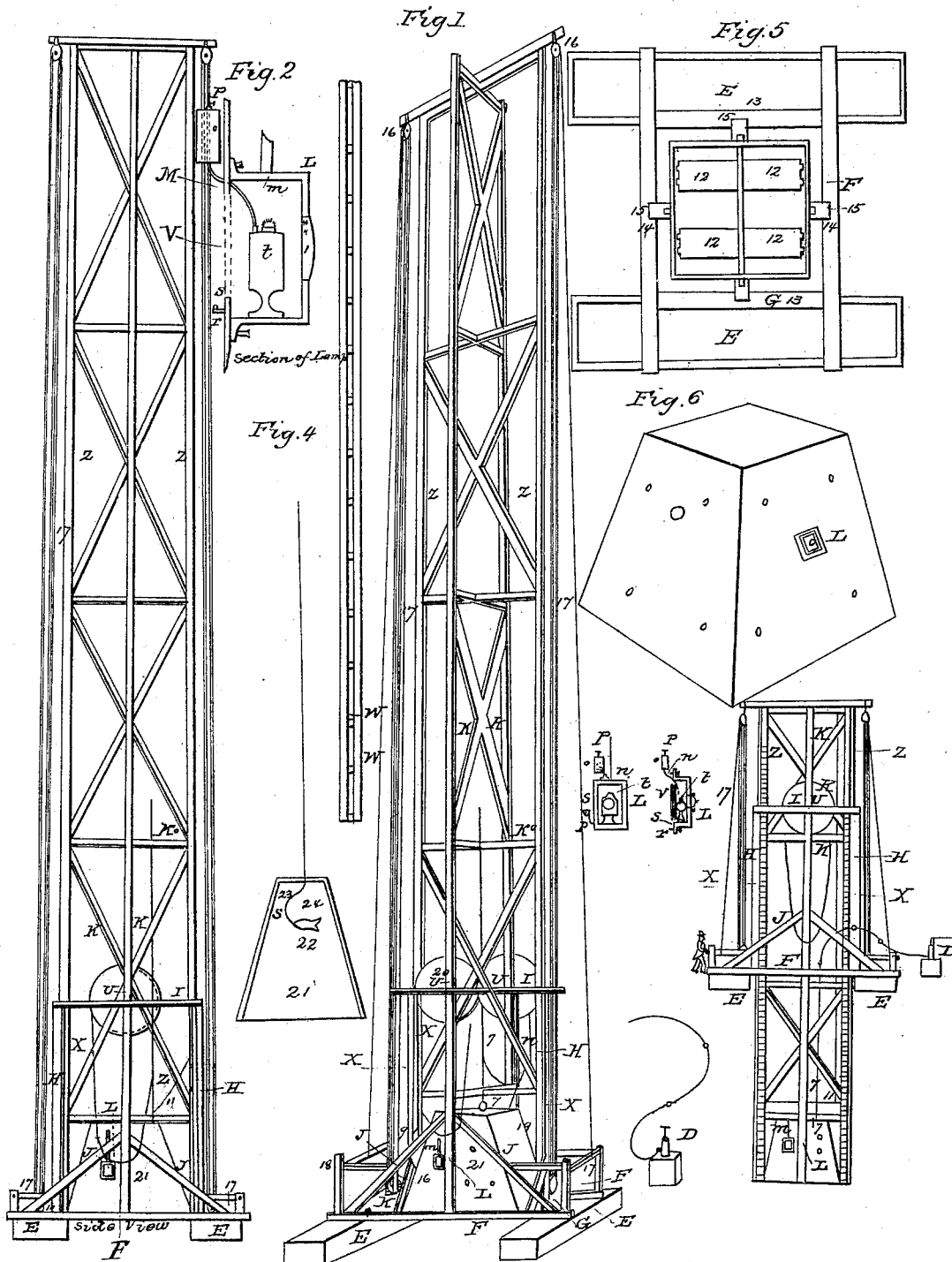
J. R. WORSTER.

2 Sheets—Sheet 1.

Diving Apparatus.

No. 6,397.

Patented April 24, 1849.

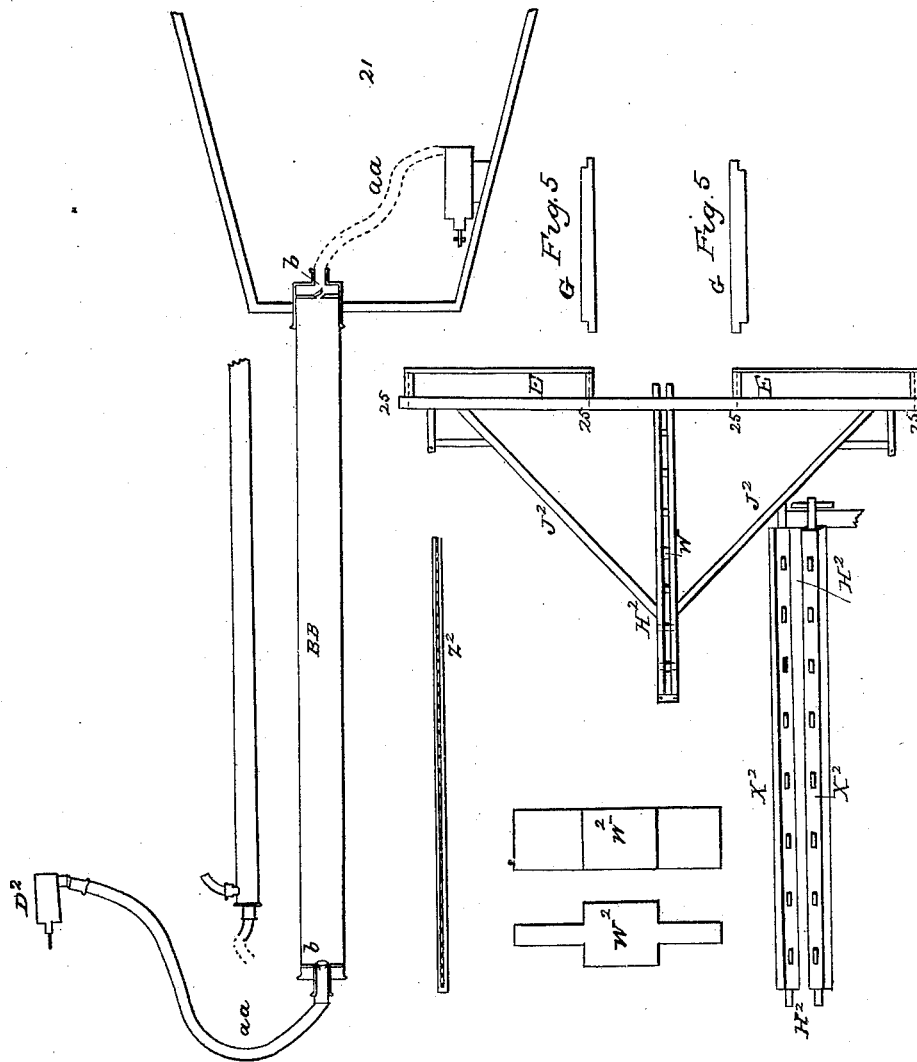


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Diving Apparatus.

No. 6,397.

Patented April 24, 1849.



UNITED STATES PATENT OFFICE.

JAS. R. WORSTER, OF BALTIMORE, MARYLAND.

DIVING-BELL.

Specification of Letters Patent No. 6,397, dated April 24, 1849.

To all whom it may concern:

Be it known that I, J. RUTHERFORD WORSTER, of the city of Baltimore, in the State of Maryland, have discovered and invented a new and useful mode and apparatus for submarine explorations, called a "stationary diving and exploring canopy," particularly adapted to searching the beds of rivers and streams, for removing obstacles to navigation and for working where there is a current.

By this mode and apparatus, we can descend and return with great rapidity, and most perfect safety, or remain any length of time under water, without inconvenience, retaining a perfect light by night or by day.

In order to enable others to make and use my invention, I will proceed to describe its construction and operation, reference being had to the annexed drawings, they being a part of this specification.

Two flat-boats E, are first constructed, about 30 feet long and 9 ft. wide, and from 2½ to 3 ft. deep, the sides of which, should be from 5 to 5½ inches thick, in order to bear more firmly, the superincumbent weight and for receiving large, iron bolts, E²⁵ which pass through, into the cross-timbers, F next described. These flats are decked or planked over, and finished, in other respects, like other boats of that class. Across those flats E are placed two pieces of timber F about 8 inches square, secured to the sides of the flats by four stout iron bolts, 25 which pass up from the bottom, and secure to the top, by a screw forelock and tap 25; the flats E being placed the distance from each other required, and the timbers an equal distance apart, to leave an aperture, to admit the canopy 21 a free passage through. Between the last named cross-timbers F is inserted two inter-ties G, Fig. 5, of equal size, which run along the sides of the flats, E at right angles with the cross-timbers, F and framed thereto. On this foundation is erected 4 double posts H and H² about 20 ft. long. They are constructed of two pieces of timber H² and Fig. 4, the required length, 5 by 10 inches, the wide sides facing each other, and tied or framed together by timber W², in such a manner, as to leave a lip X and X² on the inside of the post H and H² of about 4 inches, through which the sliding frame Z works up and down and is kept stationary. The tops of the posts H and H² are framed together I, to correspond with

the bottom, and secure stability, and the posts, H and H² are attached to the bed pieces F and F² by substantial braces, J and J² to give stability to the whole structure.

The canopy, Fig. 6, may be made of wood or iron, of size and form, most convenient, for the service intended, and is connected by its sides to the lower part of the sliding frame Z which frame is made of scantling, of strength, corresponding to the other parts, the length of which, must be governed by the depth of water, in which it is to be employed, due allowance being made for the part, which must always occupy the stationary frame, H and H².

The sliding parts Z are tied, or framed together, by cross-timbers, K^o and cross, or reversed braces, K, sufficiently close to prevent springing and twisting, under the greatest pressure required.

In the bottom of the canopy, Fig. 5, there are two platforms, 12 which fall on a cross-bar 16 each way, from the sides opposite, fixed by hinges, to the sides, and fastened by hooks to the same when they are raised up. The small canopy may be worked by pullies, 17 but, to the large size, the rack and pinion, U is applied, by placing the rack on the back part of the slides, Z² and cutting a groove on the inside of the cross-ties, W and W² any additional power may be applied.

Lamps *t* are placed on the sides of the canopy 21, in cast-iron boxes, L of suitable dimensions, screwed firmly over a clear glass V from 4 to 6 inches square, set in the sides, which throws the light in; and another glass * * is set in a metal screw-socket, inserted in an aperture, on the outside of the iron box, L which illuminates without. Out of the top of the box, L passes a tube *m* about one inch in diameter, to which, the smoke-pipe 7 and B B attaches, reaching to the top of the slides Z. A small tube *r*, passes from the inside of the canopy to the inside of the iron box, L having a stop-cock *s* by which the stream of air is regulated, necessary to sustain the lamps *t*.

The oil is contained in a reservoir *o* on the inside, and suspended under a vacuum, by a stop-cock, P and conveyed by a curved tube, *n* into the lamp, *t* when required, by turning the stop-cock, P and allowing a portion of air to pass in, to force down the oil.

In the top of the canopy 21 is inserted a

tube, 7 and B B in which is a valve *q* placed near each extreme, to which, the air-pumps, D are attached, by fixed B B and flexible *a a* joints. The air tube, 7 and B B is put on, 5 by detached pieces, as the canopy 21 descends, and coupled to the outside-air-pump, D² as it rests on the bottom, and again uncoupled, when about to be elevated, and readily adjusted to any depth of water. The 10 communication with the outside, is through a small tube, 11 which passes through the top of the canopy 21, a few inches, to which is attached a piece of flexible tube 23 of sufficient length to reach the operators; on 15 the end of which is a mouth-piece, 22 in which is a stop-cock 24.

Balls 19 are secured to one or more of the short cross-ties W² of the double posts H² in such a manner, as to act against the 20 pressure, upward and downward, as the slides Z are moved.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The stationary mode of descent, by 25 slides Z attached to the canopy 21 corresponding in length to the depth of water,

and which slides Z pass through long, upright grooves, H and H² attached to the scows E, the slides Z and canopy 21 attached being forced down together by the 30 rack and pinion I or other mechanical equivalents; the whole constructed substantially as herein described.

2. The mode of supplying and using the light, by a lamp *t* secured to the sides of 35 the canopy 21 having a chimney *m* passing out from the top, and a tube *r* and stop-cock *s* from the inside to admit a current of air of sufficient volume to sustain the lamps *t* with two glasses, one *v* of which throws 40 the light inside and the other * * out, the oil being kept in sufficient quantity in a holder *o* on the inside, suspended under a vacuum and regulated by a stop-cock P.

3. For the novel mode of communication, 45 through a tube 11, reaching to the top of the slides Z with the mouth pieces 22 and stop-cocks 24 attached.

J. RUTHERFORD WORSTER.

Witnesses:

D. W. HUDWELL,
JAMES LEAGUE.