T. KENDALL.

Apparatus for Submarine Operations.

No. 6,313. Patented April 17, 1849.

Fig: 1.

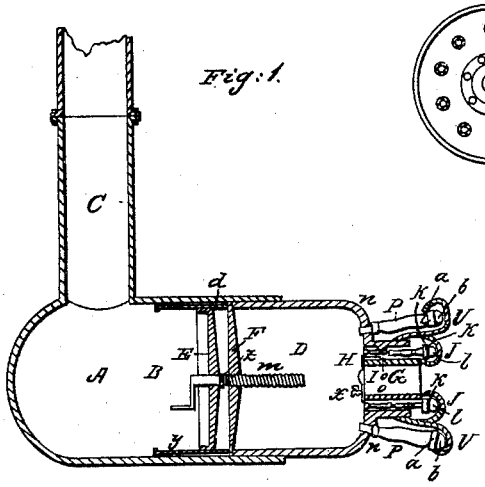


Fig: 2.

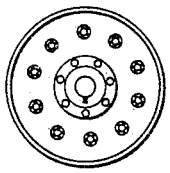


Fig: 3.

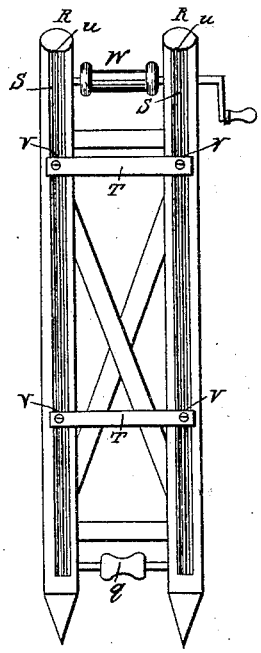


Fig: 4.

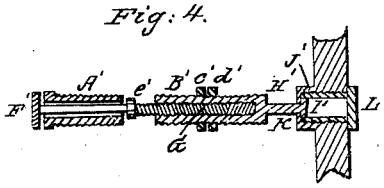
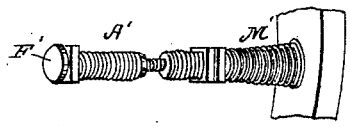


Fig: 5.



UNITED STATES PATENT OFFICE.

THOMAS KENDALL, OF NEW YORK, N. Y.

APPARATUS FOR DRILLING SUBMARINE ROCK.

Specification of Letters Patent No. 6,313, dated April 17, 1849.

To all whom it may concern:

Be it known that I, THOMAS KENDALL, of the city, county, and State of New York, have invented a new and useful Apparatus for the Purpose of Examining, Drilling, and Blasting Submarine Rocks; and I hereby declare that the following is a full and exact description of the construction and operation of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a longitudinal section of the chamber, funnel and adjuster. Fig. 2 is a transverse section of the adjuster showing the adjusting pins. Fig. 3 represents the guide posts and windlass. Fig. 4 is a longitudinal section of an adjusting pin; and Fig. 5 is a perspective view of the same.

A cylindrical chamber A B five feet in diameter and seven feet long convexly closed at one end, but open at the other, is made of cast iron of sufficient thickness to be secure against collapsing by the pressure of the water; and to the upper side of this chamber near the closed end thereof, is attached a vertical funnel C, two feet in diameter, and of such length as may be required to extend from the bottom to the surface of the water wherever the apparatus may be employed. This funnel is made of malleable or other iron, and is constructed in sections each of which has a flange at each end, and the sections are connected to each other by screws so that any portion of the funnel may be removed as occasion may require. To the open end of the chamber is fitted another cylinder D of less caliber than the chamber, and made to slide inside thereof. The forward or outward end of this adjustable cylinder (which is denominated the adjuster) is furnished with apparatus consisting of metallic screws, and india rubber, susceptible of being so closely adjusted to the vertical side of a submarine rock, as to prevent the water from penetrating to the interior of the cylinder. The forward end (the right in Fig. 1) of the chamber is furnished with a strong central cross or cross bar E and the adjuster is furnished with a corresponding cross or cross bar F and a central screw *m* is adjusted in the cross E by a collar Z and extends through the cross F to which its power is applied for the purpose of forcing the adjuster forward as occasion may require. The front end of the adjuster is reduced to the diameter of two feet, the reduction of diameter being made by a round shoulder *n*, *n*. Within this cylinder is another cylindrical tube G one foot in diameter the forward end of which extends a little beyond that of the cylinder, and the rear end thereof extends back to the rear of the shoulder *n*, *n* and this tube is connected and united to the adjuster by a circular rim or flange *o o*. The rear end of the tube is furnished with a screw cap H in the center of which is fixed a strong lens I plane or slightly convex through which the operators can examine the rock. A circular series of adjusting pins J, J, extend from the interior through the flange *o*, *o* and terminate in an elastic circle of metallized india rubber *k*, *k*. Attached to the front of this elastic circle, is a circular pad *l*. A circular sheet of thin india rubber is attached to the outside of the adjuster in front of the shoulder, and passing over the elastic circle and pad, the centerward edge is attached to the outside of the tube G. Another circular series of adjusting pins P, P extend from the interior of the chamber through the round shoulder *n*, *n* and these pins are also furnished with an elastic circle *a* pad *b* and waterproof covering similar to those above described, one edge of the india rubber covering being attached to the adjuster, forward of the shoulder *n n* and the outward edge is attached to the outside of the outward elastic circle (*a*).

Each adjusting pin (Fig. 1) is composed of several parts, as represented sectionally in Fig. 4, and perspectively in Fig. 5. A hollow screw A′, is inserted in and extends through the shoulder flange or plate O, O. B′ is a hollow screw having a thread within and without and upon the outside are fitted two screw nuts *c*, *d*, and to the inside is fitted and inserted a central screw F′, G′, which also passes through the hollow screw A′, which is free or loose thereon between the milled head F′ and the nut *e*′. From the front end of the hollow screw B′ a neck H′ projects forward and terminates in a rivet head I′ within another hollow screw K′, L′, after passing through the center of a screw cap J′, which is fitted to and adjusted upon the end of the hollow screw K′, L′, this screw passes through one of the elastic circles which is firmly held or compressed between the head L′ and the cap J′. The neck H′ and its head I′ have a free play within the hollow screw K′ L′. A tubical spring

M′, Fig. 5, is adjusted between the elastic circle and the screw nut *d*, being attached to each by its two ends. The nut *c* serves to bind and confine the nut *d* in its proper position. The central screw F′, G′, serves to project or force forward a portion of the elastic circle with its elastic covering. The tubical spring and other parts of this compound adjusting pin are protected from water by a tube or casing of india rubber one end of which is attached to the hollow screw A′ and the other end to the cap J′.

Two vertical and parallel guide posts R R are connected by cross bars and to the front of these posts are attached two metallic guides S S in each of which is a groove *u u*. Two or more sliding cross bars T T extend horizontally from one guide to the other, and to each end of each cross bar is attached a sliding dovetail V V, which slides within the groove *u u*. To the front of these cross bars the vertical funnel B is secured by metallic straps or otherwise. A crank windlass W is mounted upon the posts near the heads thereof, and a rope or chain being attached to the upper cross bar T extends up to the windlass, and passing several times round the shaft thereof, descends to a pulley *q* near the bottom, and thence to the rear end of the chamber A B to which it is also attached, so that by turning the windlass, the chamber and funnel may be either elevated or depressed as occasion may require. These guide posts are to be placed in a vertical position near the rock that is to be operated upon and secured in their vertical position by guys or braces. The chamber is to be furnished with weights or heavy materials nearly equal to its buoyancy and depressed to the depth required. The operators descend the funnel and examine the side of the rock through the lens. They then force forward the adjuster by means of the central screw *m* till the adjuster comes in contact with the rock. It is then secured in its projected position by means of four or more other screws *y*, *y*, which pass through an internal flange *d*. The two central crosses or cross bars and the central screw are then removed and the several adjusting pins are projected forward till the elastic coverings U and J, over the two circular pads *l* and *b*, comes in contact with the face of the rock. The water within the tube G is then withdrawn by means of a faucet *x* which is attached to the cap H. The cap is then removed and the operators have an opportunity to drill and charge the rocks and adjust a fuse tube or electric wires whereby the blasting charge is to be exploded.

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

1. The adjuster D, with its cap, lens, adjusting screws, elastic circles, and circular pads.

2. I also claim the combination of the chamber A B with the adjuster D, tube G, adjusting pins J, and with the guide posts R R, constructed and arranged substantially as herein described.

THOMAS KENDALL.

Witnesses:
RUFUS PORTER,
ROBERT F. WILLIAMS.