

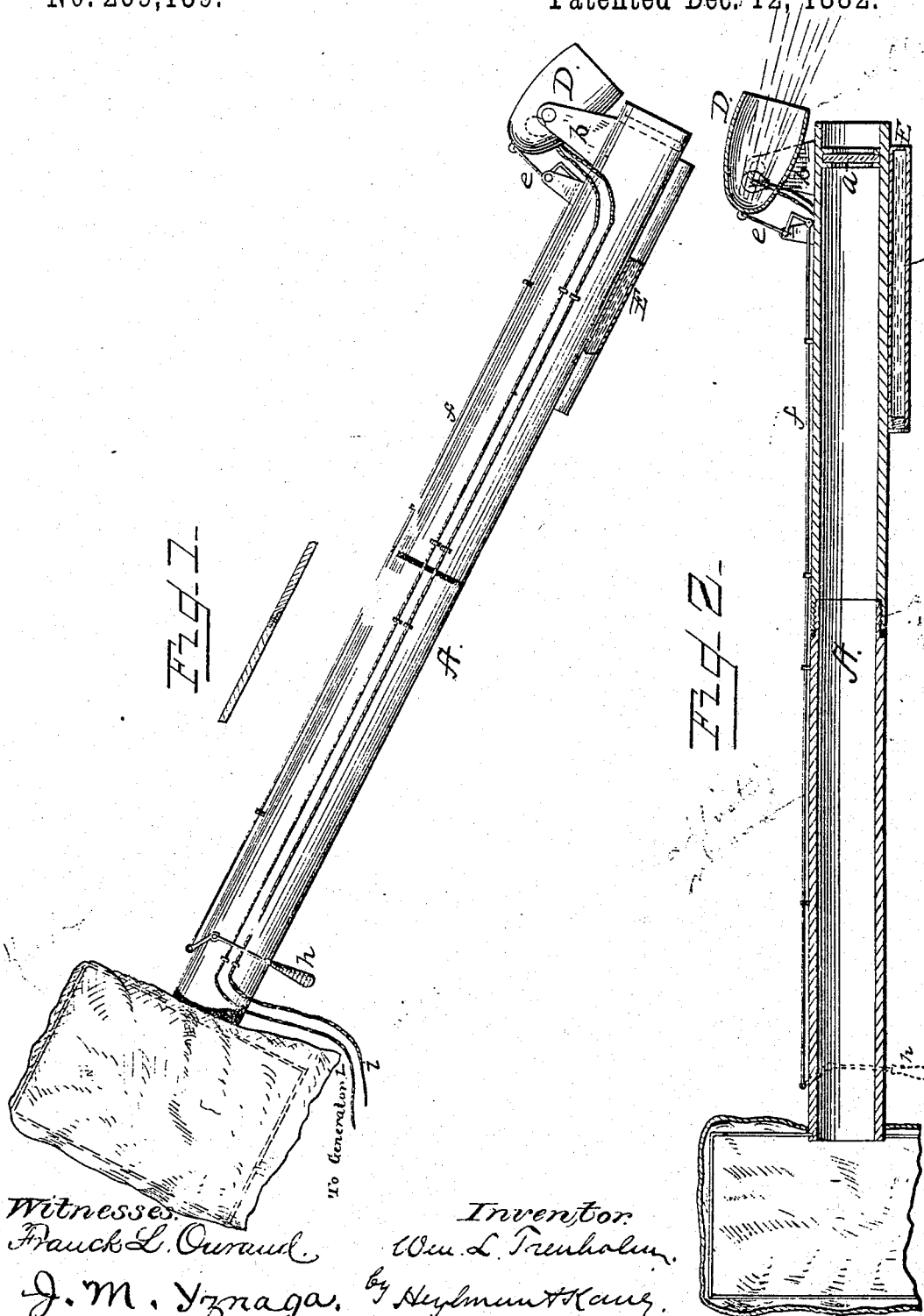
(No Model.)

W. L. TRENHOLM.

HYPOHYDROSCOPE.

No. 269,139.

Patented Dec. 12, 1882.



Witnesses
 Frank L. Ouraud.
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UNITED STATES PATENT OFFICE.

WILLIAM L. TRENHOLM, OF CHARLESTON, SOUTH CAROLINA.

HYPHYDROSCOPE.

SPECIFICATION forming part of Letters Patent No. 269,139, dated December 12, 1882.

Application filed June 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. TRENHOLM, a citizen of the United States of America, residing at Charleston, in the county of Charleston and State of South Carolina, have invented a certain new and useful instrument called "Hypohydroscope;" and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an instrument which I term a "hypohydroscope," for discovering and examining submarine objects. With an instrument of this kind divers and submarine workers are enabled to carry on repairs in harbors on the hulls of vessels and the like, and to find obstructions and objects at the bottom of streams or in sunken vessels, or to ascertain with certainty the character of any submerged object which it is desired to examine. It is specially adapted for use in connection with my system of dredging and collecting phosphates. These phosphates, it is well known, are found beneath the water, and exist in beds, layers, or strata, of indefinite location and extent, and their presence is ascertained by sounding with metal rods, which gives the fact of presence only, without affording any evidence of direction of location or extent of the deposit.

My invention therefore consists in a submarine instrument provided at its lower end with an incandescent electric light or its equivalent, and a reflector, so adjusted in a novel manner as to cast the rays of light on the object under water on or near the prolongation of the axis of the observing-tube.

My invention further consists in a tubular instrument composed of one or more sections, provided at the lower end with trunnions, supporting a reflector and carrying an electric light of the incandescent class or its equivalent.

My invention further consists in a tubular instrument provided at its lower section with trunnions, in combination with a reflector journaled to the trunnions and carrying an electric light of the incandescent class or its equivalent, and means for adjusting the inclination of the reflector.

My invention further consists in the novel

organization and construction of parts, as will be hereinafter more fully set forth.

In the annexed drawings, forming a part of this specification, Figure 1 represents an exterior view of my new instrument termed a "hypohydroscope," and Fig. 2 is a vertical sectional view of the same.

The letter A represents a tube composed of one or more sections, and of any desired length and diameter. The sections may be connected and secured together by the ordinary male and female screw-threads, with or without packing, or by means of coupling-rings, or any other means applicable for making water-tight connections. The lower end of this tube is securely closed by means of a glass plate, *a*, serving for the double purpose of preventing the water from entering the tube of the instrument, and of enabling the observer to see any submerged object toward which the instrument may be directed. This glass plate is protected by means of an extension of the tube, or by a collar or sleeve arranged to project a short distance below the lower surface of the plate. At or near the lower end of the tube are arranged a pair of trunnions, *b*, to which is journaled a reflector, D, so as to work upon the axis thereof. This reflector D is preferably made bell-shaped, and formed near its upper end with an opening for the passage of wires, as will be hereinafter described. Within this reflector D is arranged an electric light, preferably of the incandescent class, and is so adjusted in relation to the reflector that the rays will be cast from the upper portion of the reflecting-surface on the object or objects within the scope of the instrument. To the rear of the reflector D is connected the bell-crank lever *e* or its equivalent, having attached thereto a connecting-rod, *f*, extending through loops on the tube to the upper portion of the instrument, where it is connected with an actuating-lever, *h*, for the purpose of adjusting the inclination of the reflector as the observer may desire, usually casting the rays of light in the path of the axis of the tube and upon the objects to be observed and examined.

The letters *i* represent wire conductors properly insulated and secured to the exterior of the instrument, and leading from the electric generator or other source of the light to the

lamp fixed at or near the base of the instrument.

The letter E represents a holder or chamber arranged along the lower portion of the instrument, and secured thereto by any suitable means. This holder or chamber is weighted with mercury or any other substance or material having great specific gravity, the object of this being to provide certainty and facility of submersion of the tube under any circumstances of use. To the upper end of the tube is attached a wire frame or hood, of any suitable shape or form, to receive the head of the observer, and over this frame is a cloth or covering for excluding the atmospheric light.

The instrument constructed as above described may be used as follows: The observer, being in a boat or on shore at the edge of the water, having produced the light, causes the tube to be submerged with its closed end downward, placing his face under the hood at the open end of the instrument, and, grasping the handle of the actuating-lever, rectifies the adjustment of the reflector so as to illuminate the water at the submerged end of the tube; then continues the immersion of the tube, determining the depth and lateral deflection by the results of his observation until the instrument is brought to bear upon the locality or object to be examined.

The word "hypohydroscope" herein employed means an instrument to be used for viewing objects under or beneath water.

I reserve the right to vary the construction, arrangement, and adjustment of parts without departing from the spirit of my invention.

Other lights may be employed in lieu of the incandescent lights.

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

1. A submarine instrument provided at its lower end with an electric light or its equivalent and reflector, working on an axis, said light and reflector arranged on a different plane from that of the sight-tube and so adjusted as to cast rays of light upon the object under water, substantially as described.

2. In a submarine instrument, a tubular section with a glass or lens at the bottom, and provided with trunnions capable of supporting a reflector, substantially as described.

3. A submarine instrument composed essentially of one or more tubular sections, with a glass or lens at the bottom, and provided with trunnions, a reflector, and an electric light or its equivalent, substantially as described.

4. A submarine instrument composed of one or more tubular sections, with a glass or lens at the bottom, and provided with trunnions, a reflector journaled to the trunnions, an electric light or its equivalent, and means for adjusting the inclination of the reflector, substantially as described.

5. A hypohydroscope consisting essentially of a tube, an electric light or its equivalent, a journaled reflector, and means for adjusting the inclination of the reflector, substantially as described.

6. The hypohydroscope consisting of the tube, electric light or its equivalent, journaled reflector, means for adjusting the inclination of the reflector and weight-chamber, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM L. TRENHOLM.

Witnesses:

J. M. YZNAGA,
ASA WHITEHEAD.