

(No Model.)

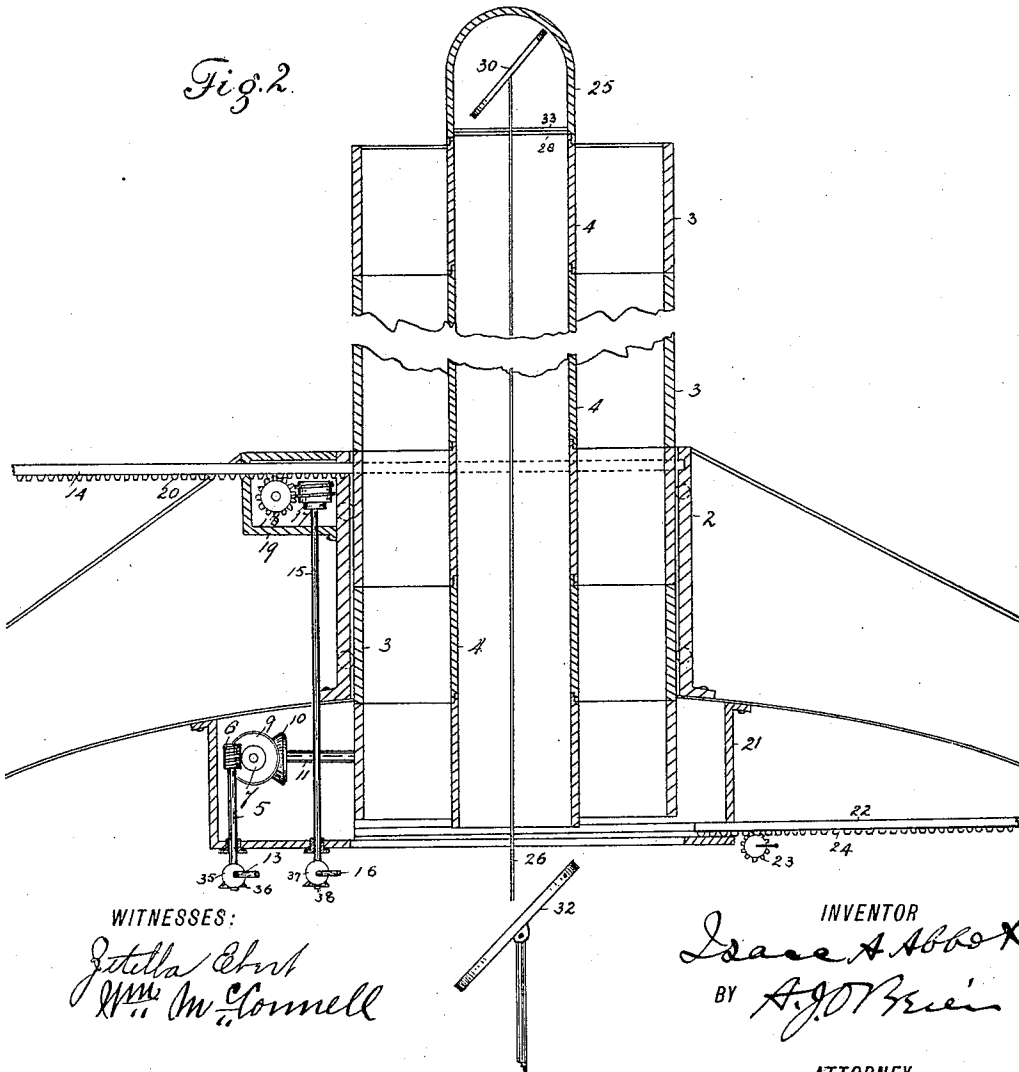
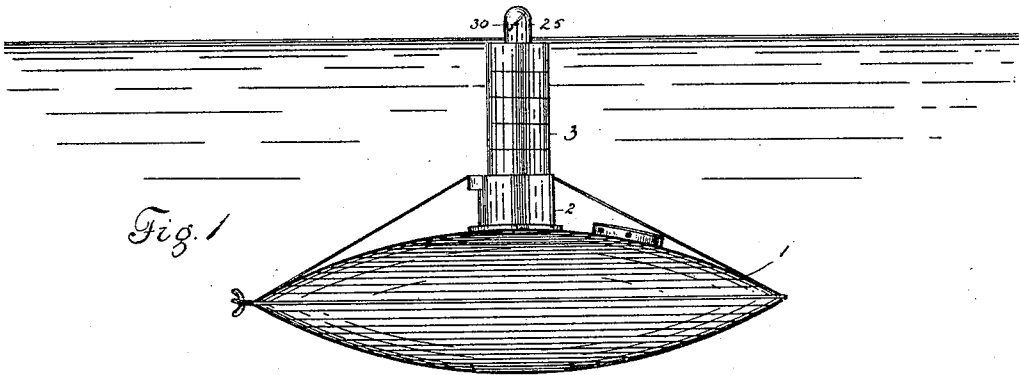
2 Sheets—Sheet 1.

I. A. ABBOT.

ATTACHMENT FOR SEEING FROM SUBMARINE BOATS.

No. 467,291.

Patented Jan. 19, 1892.



WITNESSES:

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INVENTOR

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(No Model.)

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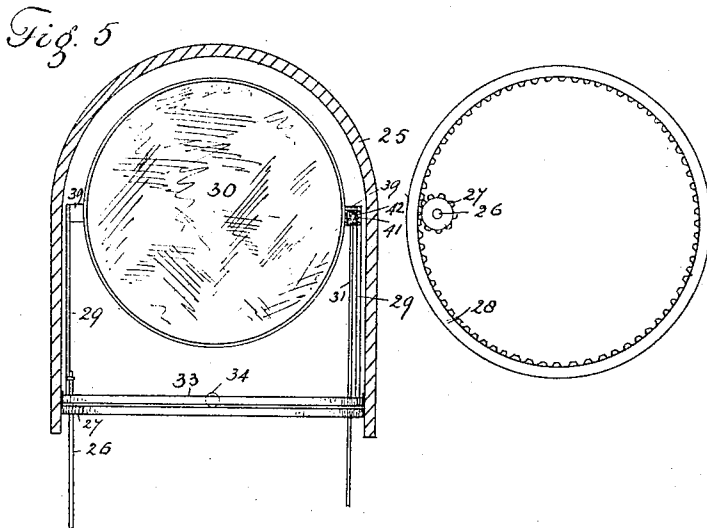
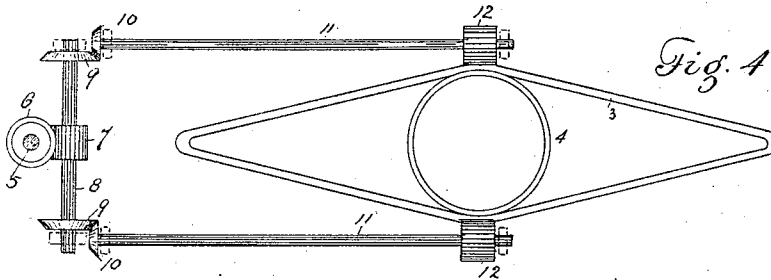
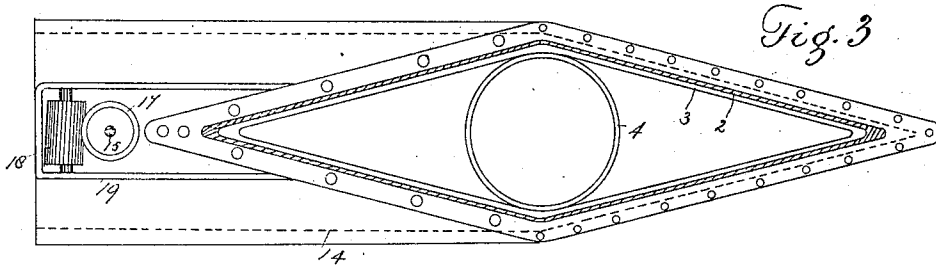


Fig. 6

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UNITED STATES PATENT OFFICE.

ISAAC A. ABBOT, OF DENVER, COLORADO.

ATTACHMENT FOR SEEING FROM SUBMARINE BOATS.

SPECIFICATION forming part of Letters Patent No. 467,291, dated January 19, 1892.

Application filed June 16, 1890. Renewed June 18, 1891. Serial No. 396,661. (No model.)

To all whom it may concern:

Be it known that I, ISAAC A. ABBOT, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Attachments for Seeing from Submarine Boats, of which the following is a specification, reference being had therein to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a new form and construction whereby it becomes practicable for those in a submarine boat to observe what is going on upon the surface of the water and view surrounding objects in any direction for a radius of several miles while the boat is located beneath the surface of the water for a sufficient distance to be out of danger from the enemy during war, whereby those provided with a boat equipped with my improvement have the advantage of watching closely and accurately every movement of the opposing party.

My object, therefore, is to produce a device of the class mentioned which shall give the party equipped therewith great and supreme advantages over the enemy, the device being at the same time of such simple construction that the movements of the boat to which it is attached shall not be materially retarded thereby, the device being also economical in cost, so that the expense of constructing a boat with this valuable equipment shall be insignificant in comparison with the advantages afforded thereby, the device being quickly and easily operated, there being no special skill or knowledge required for its successful management and ready manipulation, the improved apparatus being also reliable and durable in use and very efficient for the purpose intended.

To these ends my invention consists of the features and arrangements hereinafter described and claimed.

In the drawings is illustrated an embodiment of my invention, wherein—

Figure 1 is a side elevation of a submarine boat provided with my improvement. Fig. 2 is a vertical longitudinal section of the same enlarged. Fig. 3 is a top view, partially in section, illustrating a portion of the gearing

for manipulating the device. Fig. 4 is a top view, the deck of the boat being removed for the purpose of illustrating certain parts of the operating mechanism. Fig. 5 is an enlarged section taken through the top of the device and illustrating the mirror located within. Fig. 6 is a top view of a pinion and a cogged track for adjusting the mirror so that the same shall face in any desired direction.

In the views, wherein similar reference characters indicate corresponding parts, let the numeral 1 designate, generally, a conventional submarine boat, to the top of the deck of which is suitably secured a stationary socket-tube 2, surrounding a suitable opening in the top of the boat, for the reception of the exterior protection-tube 3, preferably lozenge-shaped in cross-section. This tube 3 surrounds and is designed to afford a suitable guard or shield for the sight-tube 4. These tubes are suitably secured together, and are adjustable vertically to any desired extent, being supported from below by a foundation located within the boat.

The adjustment of the sight-tube is accomplished by the use of suitable mechanism located within the boat and operated therefrom. As herein shown, this mechanism consists of a vertical shaft 5, provided at its upper extremity with a worm portion 6, engaging a worm-wheel 7, secured to a horizontal shaft 8, provided at each extremity with a bevel gear-wheel 9, engaging other similar wheels 10, secured to a pair of horizontal shafts 11, extending at right angles to shaft 8. The opposite extremities of shafts 11 are provided with gear-wheels 12, which are adapted to mesh in a suitable cogged track secured to the sides of the protecting-tube 3. It is thus seen that as crank 13, which is adapted by means of gear-wheels 35 and 36 to turn shaft 5, is turned a rotary motion is communicated to gear-wheels 12 and the sight-tube thus raised or lowered, as may be desired.

In order that water may not flow into the boat in case of an accident to the sight-tube, the following provision is made: At the upper extremity of the socket-tube 2 is made a valve 14, adjustable horizontally and adapted to slide in and effectually close said tube

against the water. For the adjustment and control of this valve an upright shaft 15, adapted to be turned by a crank 16 and gear-wheels 37 and 38, is suitably journaled and is provided at its upper extremity with a worm-portion 17, adapted to engage a worm or gear wheel 18, journaled in casing 19. This wheel also engages a suitable cogged rack 20, secured to or made integral with the under surface of valve 14. This valve is provided with suitable "packing," so as to prevent water from entering the tube therearound. When it is desired to open or close said valve, the crank 16 is turned in a corresponding direction.

At the base of box 21, which is secured to the under side of the deck of the boat 1, is located a valve 22 similar to valve 14, said valve being adapted to slide horizontally and close the bottom of box 21, thus offering a double assurance of safety against accidents. The operation of this valve is controlled by a suitable gear-wheel 23, which is suitably journaled in any approved support and is adapted to take in a cogged rack 24, secured to the underside of valve 22. This gear-wheel is provided with a crank or other means of imparting rotation thereto.

Sight-tube 4 is mounted by a suitable transparent dome 25, made, preferably, of glass. It will, however, be observed that I am not limited to this particular shape, as transparent covers for tube 4 may be used that will answer the purpose of the invention almost, if not quite, as well as a dome-shaped cover. In practice it is intended to regulate the depth to which the vessel shall sink in the water so that no part of the device except this dome shall be above the surface thereof, and this only while taking an observation, being immediately afterward submerged.

Extending upward through sight-tube 4 and to one side thereof is a suitable shaft 26, the upper extremity of which is provided with a suitable cogged wheel or pinion 27, rigidly secured thereto, said gear-wheel being adapted to take in a suitable interiorly-projecting circumferential cogged rack or gear 28, which is rigidly secured in the upper extremity of the sight-tube. The upper extremity of shaft 27 is journaled in a suitable ring or annular-shaped piece 33, mounted upon friction-rollers or casters 34, which rest upon track 38.

Rigidly secured to and extending upward from annular-shaped piece 33 are the standards 29, there being two in number. Said standards are located at points diametrically opposite on piece 33 and are provided at their upper extremities with suitable journal-boxes, into which the mirror or reflecting-surface 30 is poised by means of projections 39. This construction permits the mirror to be revolved about its horizontal axis.

The reference-numeral 31 designates a suitable shaft, which extends up through sight-tube 4 and to one side thereof, said shaft

being parallel to and near one of the standards 29 and suitably journaled in annular-shaped piece 33. The upper extremity of this shaft is provided with a worm portion 41, adapted to engage a worm-wheel 42, rigidly secured to or made integral with the projection 39, which corresponds with the standard 29, near which shaft 31 is located.

At the bottom of sight-tube 4 is located a mirror or reflecting-surface 32, the angle being, preferably, forty-five degrees, but which may be regulated as desired by virtue of its pivotal support 43, said mirror being adapted to catch the rays of light thrown down through tube 4 from mirror 30 and reflect the same, so that the pilot may be able to see and know the state of affairs on the surface as definitely as if he were above instead of below the water.

Friction wheels or pulleys 46 (indicated in the drawing in dotted lines) are adapted to reduce the friction of sliding or raising the sight-tube to a minimum, and are herein shown as typical of any suitable anti-frictional bearing for said tube.

It may be well to state at this stage of the specification that tube 4, with its shield, is made in sections of such length as to permit it to be easily manipulated in the limited space afforded in boats of this class, said parts being united at 47 by any suitable means, as by an interrupted screw. This construction permits the sight-tube to be run up while the boat is under the water.

If further protection against accidents may be deemed desirable, transparent partitions may be located in sight-tube 4 at suitable intervals, these partitions being made so as to render the tube water-tight, while the mirror 30, with its connected parts, may be controlled and regulated by means of a suitable electrical apparatus, while suitable electrical conductors may be passed through said partitions.

The operation of my improved device as herein disclosed will be thoroughly understood by reference to the accompanying drawings, and is as follows: When it is desired to erect sight-tube 4, the parts are secured together in the boat, and as thus joined are elevated by turning crank 13, the pinions 12 working in suitable cogged racks secured to the side of said tube. It will also be seen that a rotary motion imparted to shaft 26 causes cogged pinion 27 to take in cogged rack 28, and thus cause annular piece 33, with the mechanism supported thereon, to revolve, thereby bringing different quarters of the field in view, while a rotary motion imparted to shaft 31 causes worm portion 41 to take in worm-wheel 42, and thus causing mirror 30 to assume any desired angle with reference to the vertical plane.

Having thus described my invention, what I claim is—

1. The combination, with a submarine boat, of a vertical water-tight adjustable tube hav-

ing its base located within the boat, said tube being provided at the top with a transparent portion within which is located a suitable mirror or reflecting-surface, another mirror
5 or reflecting-surface located directly below and within the boat, the sight-tube being provided with an outer protecting-wall, preferably lozenge-shaped in cross-section, and suitable means located within the boat for ad-
10 justing the sight-tube vertically, substantially as and for the purpose set forth.

2. The combination, with a submarine torpedo-boat, of a vertical water-tight tube or conduit consisting of sections united by tight
15 joints, but readily disconnected, said tube being provided with an outer protecting-wall of suitable shape composed of sections corresponding with those of the sight-conduit proper, the upper portion of the tube being
20 transparent and provided with a mirror located directly beneath and within the boat, the lower mirror being adapted to catch the rays of light reflected through the sight-tube from the mirror above, and suitable means
25 for adjusting the sight-conduit, substantially as and for the purpose set forth.

3. The combination, with a submarine torpedo-boat, of a water-tight sight tube or conduit having its base located within the boat,
30 said conduit being provided with an outer protecting-wall of a shape adapted to reduce the resistance to a minimum, the lower portion of the outer wall being surrounded by a socket-tube secured to the boat and provided
35 with anti-frictional devices engaging the outer wall of the sight-tube, suitable means located within the boat for adjusting the sight-conduit vertically, and adjustable mirrors located within the tube and boat, sub-
40 stantially as and for the purpose set forth.

4. The combination, with a submarine boat, of a vertical water-tight sight conduit or tube having its base located within the boat, the upper portion of the tube being transparent,
45 preferably dome-shaped, and provided with a mirror located therein, another mirror located in the boat directly beneath the upper mirror, the sight-conduit being made of any desired strength and shape with a view to re-
50 ducing the resistance to a minimum, a socket-tube secured to the boat and surrounding the lower portion of the sight-tube, and a suitable valve located at the top of the socket-tube and adapted to be closed for the purpose of
55 shutting out the water in case of an accident to the sight-tube above, substantially as and for the purpose set forth.

5. The combination, with a submarine boat, of a vertical water-tight sight-tube having its base located within the boat and provided
60 with a transparent upper portion within which is located a mirror, another mirror located in the boat directly below the upper mirror, means for adjusting the sight-tube vertically, said means being located within
65 the boat, and a valve located within the boat and adapted to close the bottom of the sight-tube and prevent the water from entering the boat in case of accident to the tube above
70 the boat, substantially as and for the purpose set forth.

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

ISAAC A. ABBOT.

Witnesses:

ISHAM R. HOWZE,
WM. McCONNELL.