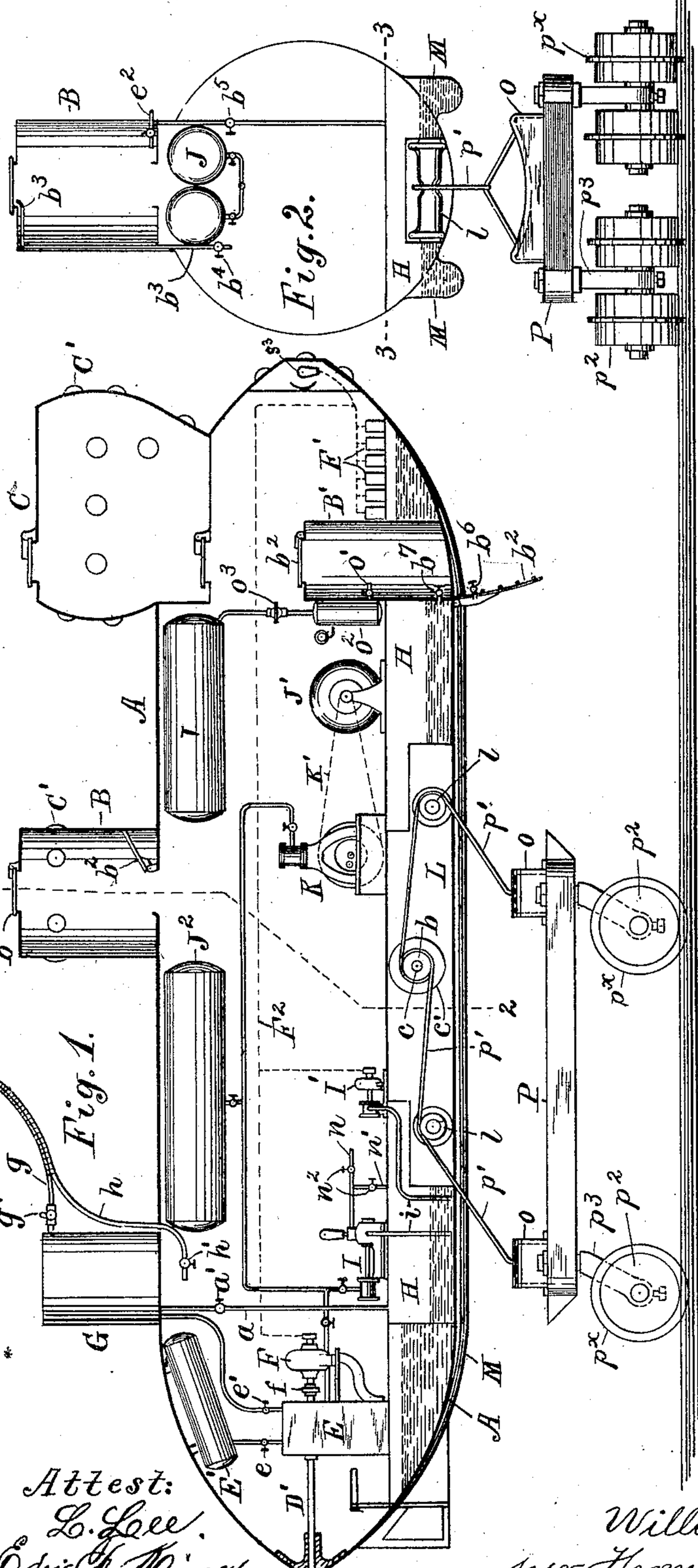
(No Model.) 2 Sheets—Sheet 1.

W. R. HINSDALE.

SUBMARINE WRECKING BOAT.

No. 575,890. Patented Jan. 26, 1897.



Attest:
L. Lee.
Edw. F. Kinsey.

Inventor.
William R. Hinsdale,
per Thomas S. Crane, Atty.

(No Model.) 2 Sheets—Sheet 2.

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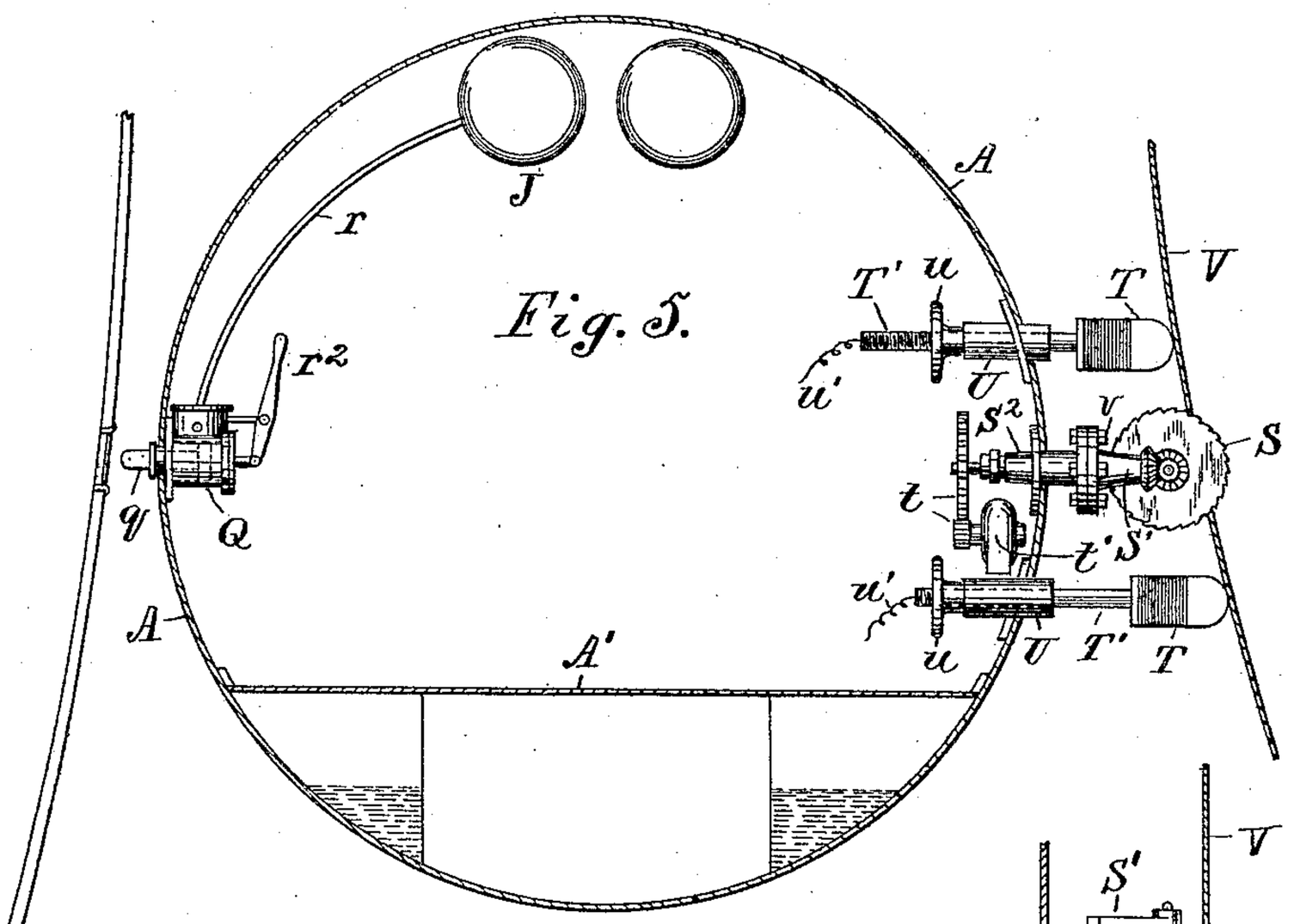


Fig. 5.

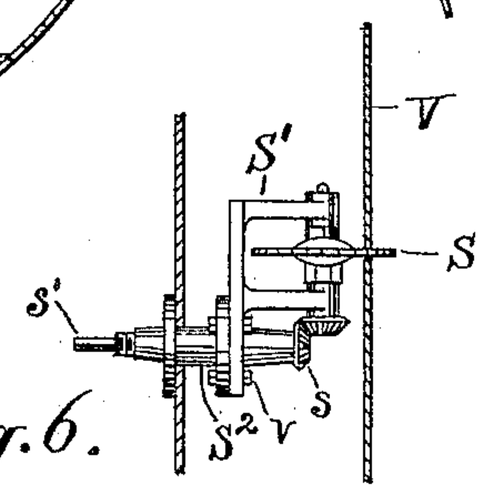
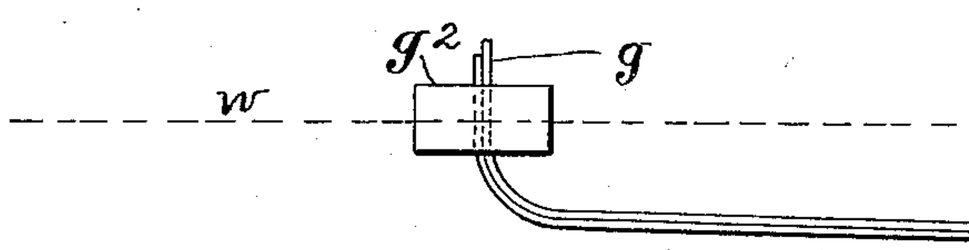


Fig. 6.



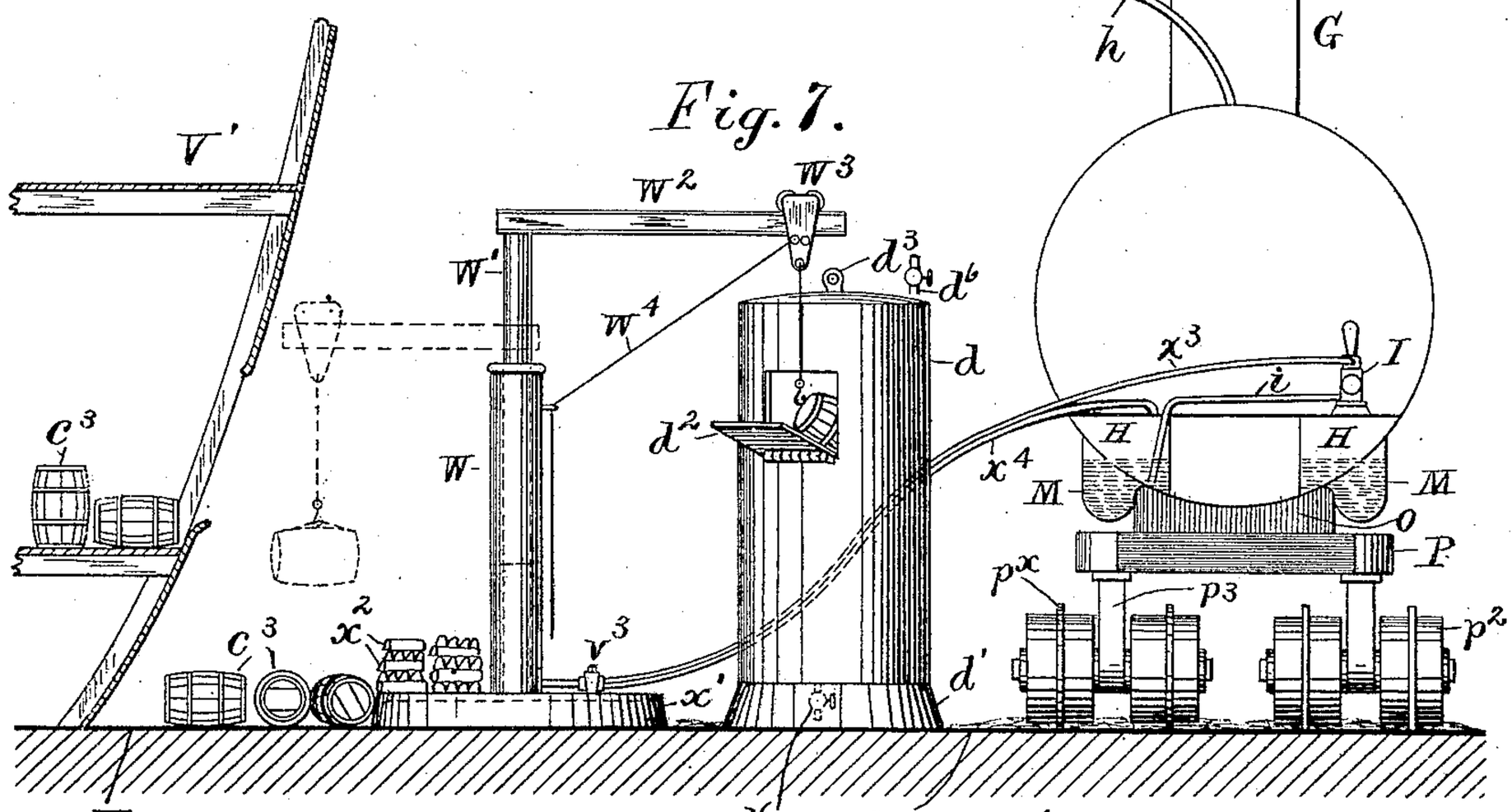


Fig. 7.

Attest:
L. Lee.
Edw. F. Kinsey

Inventor.
William R. Hinsdale,
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UNITED STATES PATENT OFFICE.

WILLIAM R. HINSDALE, OF ORANGE, NEW JERSEY, ASSIGNOR TO CARROLL P. BASSETT, OF SUMMIT, NEW JERSEY.

SUBMARINE WRECKING-BOAT.

SPECIFICATION forming part of Letters Patent No. 575,890, dated January 26, 1897.

Application filed April 15, 1896. Serial No. 587,711. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. HINSDALE, a citizen of the United States, residing at Orange, Essex county, State of New Jersey, have invented certain new and useful Improvements in Submarine Wrecking-Boats and Attachments, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to that class of submarine boats in which a weight is suspended by a rope below the boat and provided with means for winding and unwinding the rope at pleasure, so as to hold the boat at any desired level above the bottom. Heretofore in such constructions the weight has served merely as an anchor, but in the present invention I provide a weight having an oblong body, with caster-wheels at opposite ends, so that when the propeller of the boat is rotated the weight may travel along the bottom and retain the boat at a uniform distance from the same. Such construction enables the operator to explore the bottom from a uniform distance, and prevents the concussion of the boat with irregularities of the bottom and its entanglement with submarine vegetation. To operate the propeller, I provide an oil-engine for regular use, as such motive agent is more economical than electricity, but connect the propeller-shaft detachably with an electric motor, so that it may be driven thereby in emergencies. A reservoir of compressed gas is provided to start the oil-motor. An oil-engine is used to operate an electric dynamo within the boat to actuate various electric motors required in wrecking operations, and storage batteries are also provided to operate such motors in emergencies. Oil is also used for operating a pump for filling and emptying the ballast-tanks and for analogous purposes, the exhaust from such pump and engine being discharged within an exhaust-tank upon the boat, so that the air may not be fouled.

My invention includes various details of construction which will be fully understood by reference to the annexed drawings, in which—

Figure 1 is a vertical section of the boat with the shell in section at the center line to expose the internal fixtures and the traveling weight dragging toward the rear of the boat. Fig. 2 is a transverse section of the boat on line 2 2 in Fig. 1, the traveling weight not being shown in section. Fig. 3 is a plan taken in section on line 3 3 in Fig. 2, with the floor broken away to expose the hoisting-drum and rolls and the ends of the boat broken away for want of room upon the sheet. Fig. 4 is a plan of the traveling weight. Fig. 5 is a transverse section of the boat-shell on line 5 5 in Fig. 3, with the skin of a wreck and a sawing attachment operating upon the same at the right-hand side and the skin of a vessel with a dead-light at the left-hand side and a pneumatic plunger arranged for breaking the dead-light. Fig. 6 is a plan of the sawing fixtures with the adjacent shell of the boat and skin of the wreck. Fig. 7 is a diagram showing a hydraulic derrick and a freight-box operating conjunctively with the boat to remove freight from a wreck.

A is the shell of the boat, B an air-lock upon the top of the same, and B′ an air-lock opening through the bottom of the same.

A′ designates a floor across the shell near the bottom, below which the ballast-tanks are located, and the space above which constitutes the living-room and also contains the machinery for propelling the boat and various wrecking operations.

C is a pilot-house, D the propeller-wheel, and E a casing containing an oil-engine to rotate the propeller-shaft D′. The oil-engine is connected with an oil-tank J^2.

An electric motor F is shown connected with the inner end of the propeller-shaft by a detachable coupling *f*.

A gas-tank E′ is shown connected with the casing E by a pipe with cock *e*, and an exhaust-pipe with cock *e′* is shown extended from the casing to a closed exhaust-chamber G upon the top of the boat. A vent-pipe *g*, containing a check-valve *g′*, is extended from the upper part of the exhaust-chamber and is in practice connected with a float g^2, which is indicated in the diagram Fig. 7 with a water-line *w*.

The gas in tank E′ would be used to start the motor in casing E, the exhaust from the

motor being discharged into the tank G, from which it would be led to the surface by the pipe g and float g^2, the check-valve g' opening upwardly, so that it may prevent any access of water to the exhaust-chamber or oil-engine if the pipe g be broken. The pipe g and its float may be hauled down to the boat when the latter is traveling and used chiefly when the boat is located for some time by a wreck or other submarine object.

An air-equalizing pipe h is shown extended through the shell adjacent to the exhaust-chamber and secured to the vent-pipe q, so as to be supported by the same float, and is provided within the boat with a cock h' to place the living-room of the boat when at rest in communication with the atmosphere.

Compressed-air tanks J are provided to furnish air to divers and to renovate the atmosphere for breathing, but their use for the latter purpose is superseded by the pipe h when the same can be used, as the discharge of the vitiated air by means of a pump serves to draw a supply of the fresh air into the boat.

Water-ballast tanks H are disposed at opposite sides and ends of the boat, and pumps I I' are provided, which may be used to pump out the vitiated air and also for shifting the water in the ballast-tanks to vary the position of the boat in the water at pleasure or to discharge such water to increase the buoyancy of the boat when desired. The suction-pipes of the pumps are shown connected with one of the tanks and the discharge-pipe provided with branches n and n' with cocks n^2 to illustrate the means for connecting the pump with other tanks. A drain-pipe a, with cock a', connects the bottom of the exhaust-tank G with one of the ballast-tanks to relieve the exhaust-chamber of condensed water. Water-keels M are shown at opposite sides of the center line upon the bottom of the shell A and connected with the adjacent ballast-tanks H, such keels being projected into line with the bottom of the shell, so as to furnish a stable support for the same when it rests upon the bottom of the ocean. The keels also furnish guides to engage saddles o upon the opposite ends of the traveling weight P, which is suspended from the boat by ropes p'. The ropes are attached to drums b b', which are mounted upon a shaft c, extended across an open pocket L in the bottom of the boat, the drums being separated by a flange c'. The ropes are extended from the drums over guide-rolls l, which are set in the pocket L at the same distance apart as the saddles o, so that the weight hangs normally below the rolls. An electric motor c^2 is shown applied to the shaft c, and the drums b and b' may be clutched thereto by any suitable means, so as to be rotated together or independently. The ropes p' are fastened to the ends of the drums so as to wind toward the middle at the flange c', and thus bring both ropes upon the center line of the boat when the traveling weight is hoisted against the bottom of the same, as shown in Fig. 7. The saddles o are then drawn into contact with the bottom of the boat between the two keels, thus holding the weight steady upon the bottom of the boat when the latter is in motion or holding the boat steadily upon the weight when at rest, as shown in Fig. 7.

By winding either of the ropes p' when the weight is suspended below the boat in motion the load is transferred to the roll over which such rope passes, and the pitch of the boat upward or downward may thus be varied at pleasure by the winding of the ropes.

The air-lock B is provided with the usual doors b^2 at the top and bottom and is arranged to be filled with water while occupied by a diver before making his exit. A pipe b^3 with cock b^4 is shown in Fig. 2 extended from the interior of the boat to the top of the air-chamber to facilitate the filling of the air-lock with water from the pipe e^2 when occupied by the diver, (who would already have his air-hose suitably connected for him to leave the submarine boat,) both doors of the air-lock being closed and the water entering the bottom of the lock, while the pipe b^3 discharges the air from the top of the same into the living-apartment of the boat. When the air-lock is thus filled with water, the diver opens the upper door and passes out.

Upon the diver's return to the air-lock the water is drawn from the same by a pipe with cock b^5 connected with a ballast-tank, as shown in Fig. 2, the place of the water being supplied with air through pipe b^3, after which the lower door of the air-lock may be opened for the diver to pass into the boat. The lower air-lock B' has an aperture in the lower door provided with cock b^6, by which the water may be admitted and the pressure equalized with the ocean, for the diver to pass out of the lock. Upon his return and the closing of the lower door and valve b^6 a cock b^7 is opened to one of the ballast-tanks to discharge the water from the air-lock thereto and to equalize the pressure with that in the boat, after which the operator may open the upper door of the air-lock. An air-supply pipe o' is shown extended into the same to supply the diver's hose with air, and an air-reservoir o^3 is shown connected with such pipe and with the compressed-air drum J by the reducing-valve o^3.

An electric motor I' is shown connected with a pump for use in emergencies in place of the pump driven by the oil-engine, and an electric dynamo J' is shown connected to an oil-engine K by belt K', the current from the dynamo being used for lighting and for driving the motors referred to herein.

A series of storage batteries F' is shown at one end of the boat and connected to the propeller-motor F and the pump-motor by conductor F^2 for use in emergencies.

The boat is rendered sufficiently buoyant to lift and carry the traveling weight by discharging the water from the ballast-tanks,

and the ballast may be so adjusted as to float the boat independently of the traveling weight, and under such conditions the boat may be moved at a uniform distance from the bottom of the ocean with the traveling weight resting thereon.

To drag the traveling weight with facility, it is provided with caster-brackets p^3, having broad bearing-wheels p^2 with flanges $p^\times$, which enable the wheels to follow the lead of the boat, and the bottom may thus be explored with the boat moving at a regulated distance above the same by inspection through the windows C′ upon various parts of the boat.

The boat is especially designed for submarine wrecking, and Fig. 5 shows means for penetrating the skin of a wreck to grapple the same or to remove the cargo. For grappling the same I provide a pneumatic plunger to break through the dead-lights upon the wreck. The plunger q is projected through a stuffing-box upon the shell of the boat and operated by a piston within a pneumatic cylinder Q, the valve-chest of the cylinder being connected by pipe r with a compressed-air tank J, and the chest being provided with a suitable valve to reverse the motion of the plunger by means of a hand-lever r^2, the exhaust discharging into the living-room of the boat. The air-pressure operates within the valve-chest and the plunger is actuated by moving the hand-lever back and forth to reverse the motions of the plunger, or its motion is stopped by shifting the handle to its mid-position, as is common in actuating ordinary slide-valves. By adjusting the boat with the plunger in proximity to the dead-light, as shown in Fig. 5, the latter may be broken by the blows of the plunger and grappling-hooks inserted through such dead-lights.

For cutting through the skin of a vessel to gain access to the cargo I provide a circular saw S, mounted in a swiveling bracket S′ upon a bearing S^2 on the outer side of the boat, and connect the saw by gears s, shaft s', and cog-wheels t with an electric motor t', adapted to rotate the saw. The swiveling bracket S′ is provided with journals to support the saw-mandrel parallel with the side of the boat, and the saw is made of disk form, so that its edge projects outwardly at right angles from the side of the boat and thus intersects any object which may be pressed or drawn toward the boat. With this arrangement the saw is adapted to cut a slit in such object at the point of contact.

Electromagnets T are shown mounted upon the ends of spindles T′ at opposite sides of the saw, which spindles are projected through bearings U upon the shell of the boat and provided inside with screw-threads and hand-wheels u to draw the magnets toward the shell. Electric conductors u' are shown extended from the inner ends of the spindles T′, and would be insulated and properly extended through the spindles to operate upon the coils of the magnets T, the conductors being connected with the dynamo J′ or batteries F′. When the boat is in proximity to the iron or steel hull of a wreck, the hand-wheels u may be slackened and the spindles pushed outward until the magnets touch the iron hull, to which they would become attached by magnetic attraction, and the boat, floating in the water, may then be drawn toward the hull of the vessel to force the saw through the skin V of the same by screwing the hand-wheels upon the spindles T′. The saw-bracket S′ is shown in Figs. 5 and 6 adjusted horizontally, so that the saw may make a vertical cut in the skin V. When such cut is completed, the current would be cut off from the magnets, the boat pushed away from the skin V, and then lowered sufficiently for the magnets to reëngage the skin at an adjacent point to form another cut. Horizontal cuts are made by turning the bracket S′ above or below the spindle s', which may be done from the inside of the boat by providing suitable means or by a diver operating upon the outside of the boat through the agency of the bolts v. (Shown in Figs. 5 and 6.)

In the diagram shown in Fig. 7 the bottom of the ocean is designated X, with part of a hull V′ resting upon the same and its skin broken through to reach the cargo, consisting of barrels c^3. A hydraulic wrecking-crane is erected adjacent to the hull, with a freight-tank d set adjacent to the crane. The tank has a hollow pan-shaped foot d' at the lower end to engage the soft bottom of the ocean and a door d^2 in one side below the top to admit the freight.

By making the door d^2 in the side of the freight-tank below the top the tank may be used to receive buoyant articles, which when inserted through the doorway would rise to the top of the tank and be retained therein before the door was closed and during the introduction of other articles. To facilitate such use of the tank, it is provided with the foot d' at one end, adapted to hold it upright upon the ocean-bottom.

When loaded, the freight-tank would be lifted to a barge or float by a hoist-rope attached to an eye d^3 upon the top of the tank. To drain the water from the freight-tank when it is lifted above the surface of the ocean, cocks d^6 are provided at the top and bottom, and the tanks may thus be greatly lightened before they are lifted from the water.

The crane consists of a vertical cylinder W with ram W′, having a boom W^2 at the top, upon which a movable carriage W^3 is mounted. A rope W^4 is provided to adjust the carriage upon the boom and to turn the boom around with the ram, as indicated by dotted lines at the left side of the cylinder. The cylinder W is attached to a broad hollow foot x', adapted to engage the soft bottom of the ocean, and which would in practice be steadied or weighted by stones or bars of pig-iron

x^2. The cylinder is connected by pipe x^3 and three-way cock v^3 with the pressure-pipe from the pump I inside the boat, and the cock is also connected by an exhaust-pipe x^4 with one of the tanks H inside the boat, to which the suction-pipe i of the pump is connected. The cock v^3 may be turned to admit fluid under pressure and raise the ram W′, or to discharge the fluid to the tank II to lower the ram, as is common in hydraulic cranes.

The coöperation of the hydraulic crane with the pump inside the boat secures the use of power to lift and handle heavy loads with great facility adjacent to a wreck.

The oil-engine K may be used to drive an air-compressor, if required.

The boat would be provided with an electric search-light s^3 at the bow of the boat, which is shown connected with the storage batteries F′. Only a single dotted line F^2 designates the circuit from the storage batteries, as such dotted line may properly represent a cable containing two conductors to complete the circuit.

From the above description it will be understood that the boat may be propelled and operated with great economy by oil-engines for working the propeller, the ballast-pumps, and dynamo, reserving the storage batteries for furnishing an electric power in emergencies. The provision of the traveling weight with caster-wheels enables the boat to travel at a uniform distance from the bottom, and to thus explore the bottom without the unsteady motion which is produced by contact with the same. The progress of the boat adjacent to the bottom is thus made much more rapid and comfortable than where the wheels are placed upon the boat to support the same directly upon the bottom.

The provision of the double water-keels permits the water ballast to operate more effectively upon opposite sides of the boat, as it is farther from the center than that which is contained in tanks within the shell, while the keels furnish the boat with a more steady base whenever it is rested directly upon the bottom. The circular saw and pneumatic plunger furnish means for operating with great facility upon a wreck, while the crane and freight-tank enable the operators to handle and remove with great rapidity the objects which may be found upon the wreck.

The boat may, if desired, be provided with a torpedo-tube and used for placing and discharging torpedoes in the usual manner.

Hydroplanes may be affixed to the side of the boat to be operated from the inside and inclined either upward or downward, if it should become necessary to disconnect the hoist-ropes from the traveling weight, in case the latter is fouled with obstructions, or when used as a torpedo-boat.

Having thus set forth the nature of my invention, what I claim herein is—

1. The combination, with a submarine boat, of a traveling weight provided with wheels to run upon the bottom of the ocean, and connected with the boat by two hoist-ropes, the boat being adapted to lift and carry the weight when required, and provided with mechanism for winding and unwinding the ropes at pleasure, substantially as herein set forth.

2. The combination, with a buoyant submarine boat, of a traveling weight provided with wheels to run upon the bottom of the ocean, and connected with the boat by two hoist-ropes having their ends forked and connected each at two points with the weight as described, and the boat being provided with mechanism for winding the ropes and holding the weight at an adjusted distance from the bottom of the boat, as and for the purpose set forth.

3. The combination, with a buoyant submarine boat, of a movable or traveling weight attached to the boat and provided with caster-wheels, to support the weight movably upon the ocean-bottom, substantially as herein set forth.

4. The combination, with a submarine boat having cylindrical body, of a movable or traveling weight connected with the boat by two hoist-ropes, and provided with concave saddles adapted to fit the bottom of the boat and support the same, as and for the purpose set forth.

5. A submarine boat having cylindrical body, with a hollow longitudinal keel adapted to carry water ballast, at each side of the center line, the keels also serving to steady the boat when resting upon the bottom, substantially as herein set forth.

6. The submarine boat having cylindrical body, with a hollow longitudinal keel adapted to carry water ballast, at each side of the center line, a longitudinal water-tank within the shell above each of the said keels and communication between each of the said tanks and the keel below it, as and for the purpose set forth.

7. The combination, with a submarine boat having cylindrical body, with a hollow keel projected downwardly at each side of the center, of a traveling weight connected with the boat by two hoist-ropes, and provided with concave saddles of suitable length to fit endwise between the keels and support the boat, as and for the purpose set forth.

8. The combination, with a submarine boat, of journals upon its outer side, with a mandrel supported in said journals parallel to the side of the boat, a disk saw secured upon such mandrel with its edge projected outwardly from the boat, and means for rotating the saw at pleasure, substantially as herein set forth.

9. A submarine boat having a circular saw supported in bearings upon its outer side, means for rotating the saw, and means adjacent to the saw for grappling a wreck and pressing the saw into the same, substantially as set forth.

10. A submarine boat having a circular saw

supported in bearings upon its outer side, means for rotating the saw, and electromagnets supported adjustably, adjacent to the saw, for magnetically grappling an iron wreck and pressing the saw thereinto, substantially as herein set forth.

11. A submarine boat having a circular saw supported in bearings upon its outer side, with means for adjusting the saw in various positions, a motor within the boat and gearing connecting the saw through the shell of the boat, with said motor, substantially as set forth.

12. In a submarine boat, the combination, with the shell and an engine for generating power within the same, of an exhaust-tank attached to the shell, with connection to the exhaust-pipe of the engine, and a hose extended upward from such exhaust-tank, and provided with a float to support the end upon the water, substantially as herein set forth.

13. In a submarine boat, the combination, with the shell and an engine for generating power within the same, of an exhaust-tank attached to the shell, with connection to the exhaust-pipe of the engine, an exhaust-hose extended upward from such exhaust-tank, with a float to support the end upon the water, and said hose being provided with a check-valve to prevent the accidental entrance of water, substantially as set forth.

14. In a submarine boat, the combination, with the shell and an engine for generating power within the same, of an exhaust-tank attached to the shell, with connection to the exhaust-pipe of the engine, an exhaust-hose extended upward from such exhaust-tank, with a float to support the end upon the water, and a ventilating-hose extended upward from the shell with the exhaust-hose, with its end supported by the same float, as and for the purpose set forth.

15. In a submarine boat, the combination, with the shell and an engine for generating power within the same, of an exhaust-tank attached to the shell, with connection to the exhaust-pipe of the engine, a hose extended upward from such exhaust-tank to the surface of the water, a drainage-pipe connecting the lower part of the tank with a ballast-tank, and a pump to discharge the excess of water from such ballast-tank, the whole arranged and operated substantially as set forth.

16. The combination, with a submarine boat, of an oblong weight connected near its opposite ends with two hoist-ropes, supporting-rolls for such ropes at different distances from the bow of the boat, and means for winding the ropes independently and throwing the whole or any desired portion of the said weight upon one of the rolls, to vary the inclination of the boat, substantially as herein set forth.

17. The combination, with a submarine boat, of an oblong weight connected near its opposite ends with two hoist-ropes, supporting-rolls in the bottom of the boat for such ropes, and two drums upon the same shaft with central dividing-flange and having the ropes secured to their outer ends so as to wind toward such flange, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM R. HINSDALE.

Witnesses:
L. LEE,
THOMAS S. CRANE.