

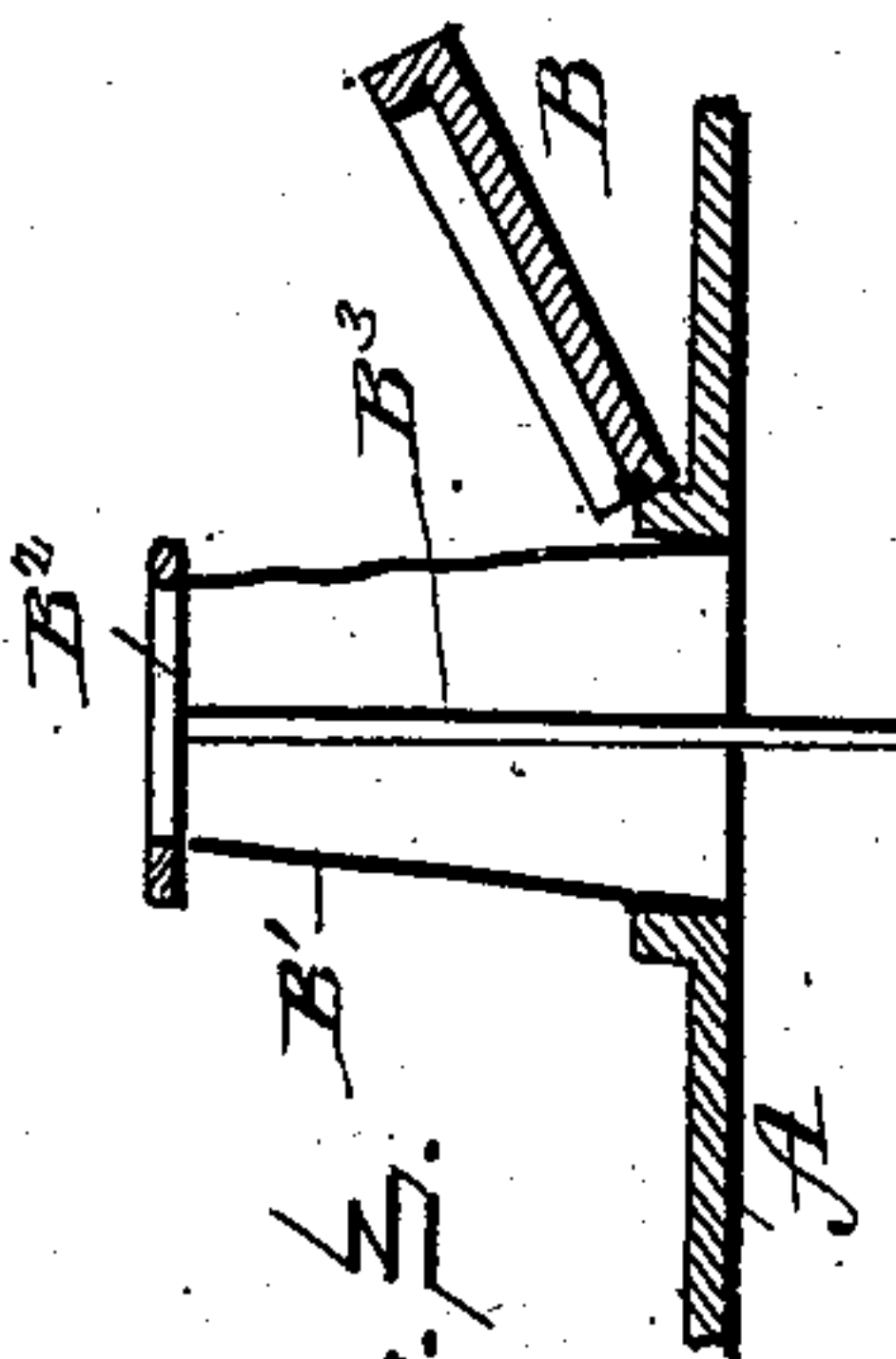
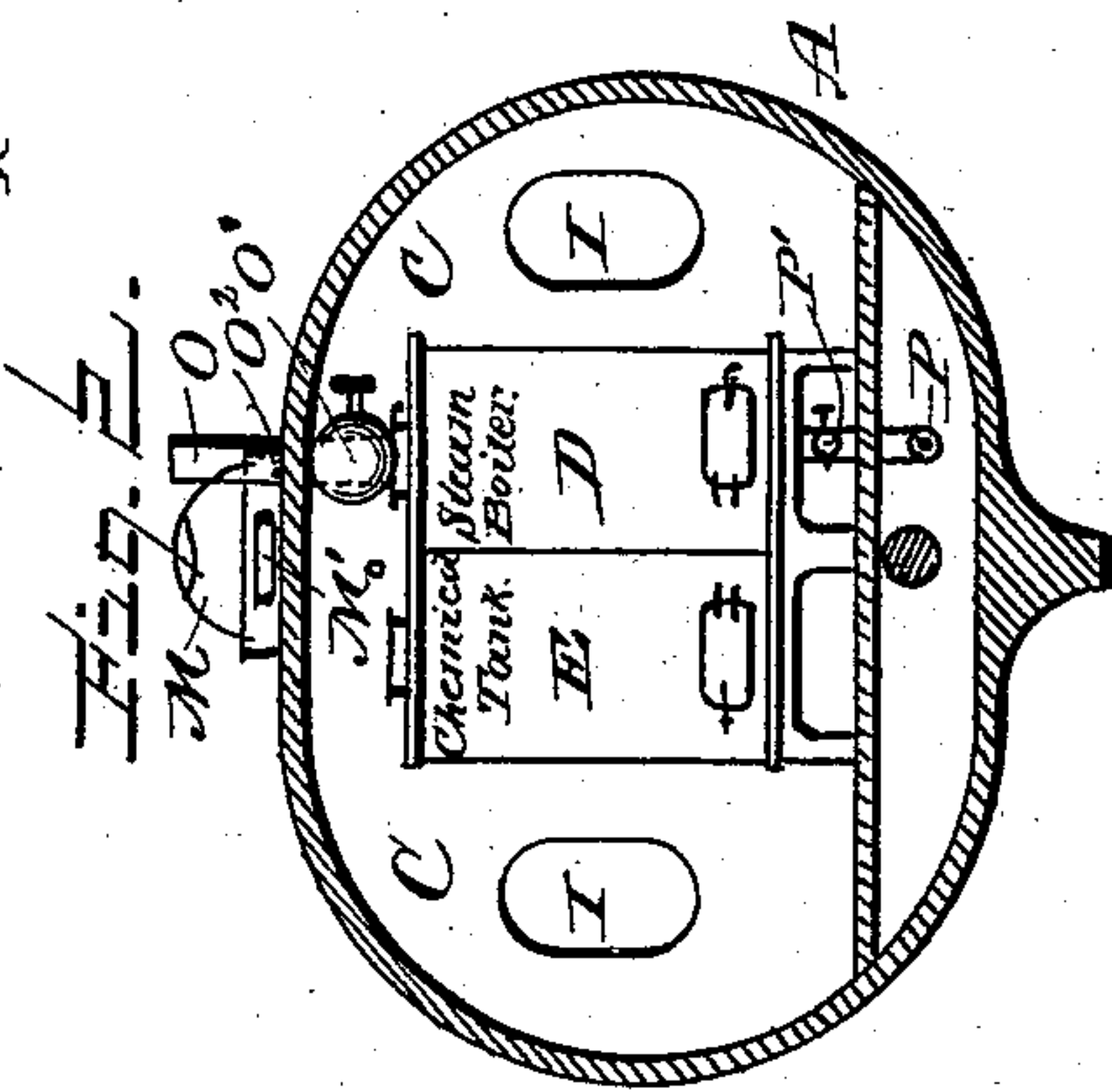
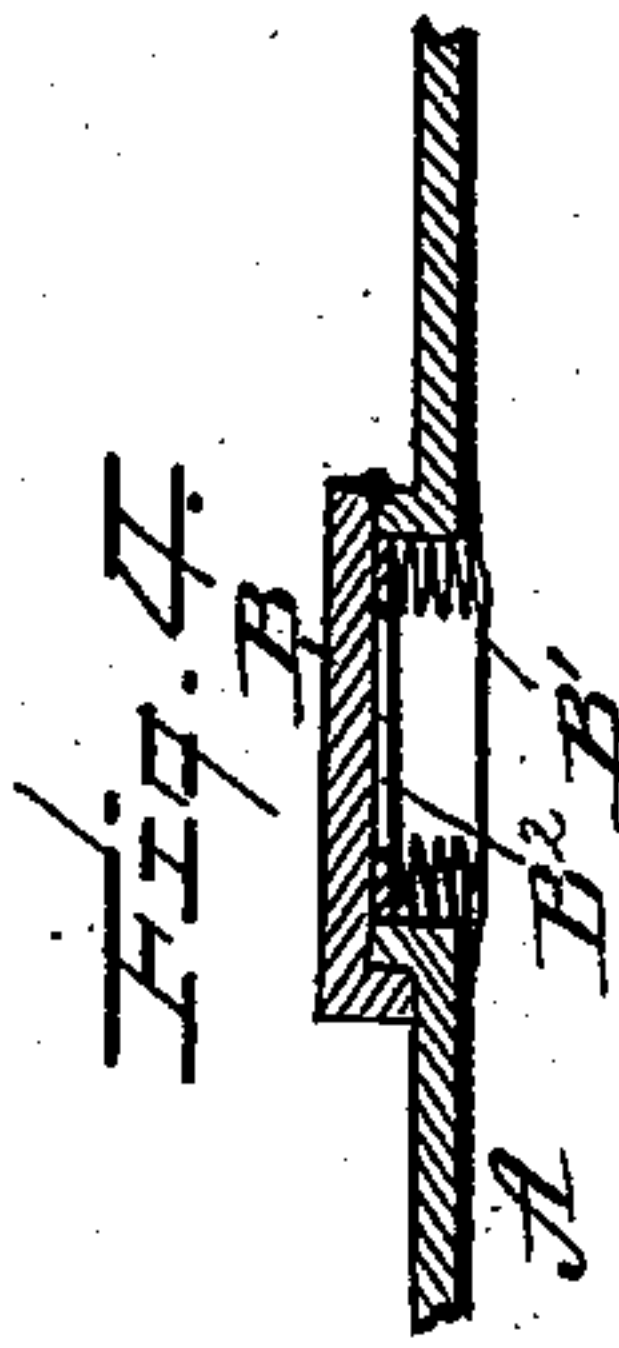
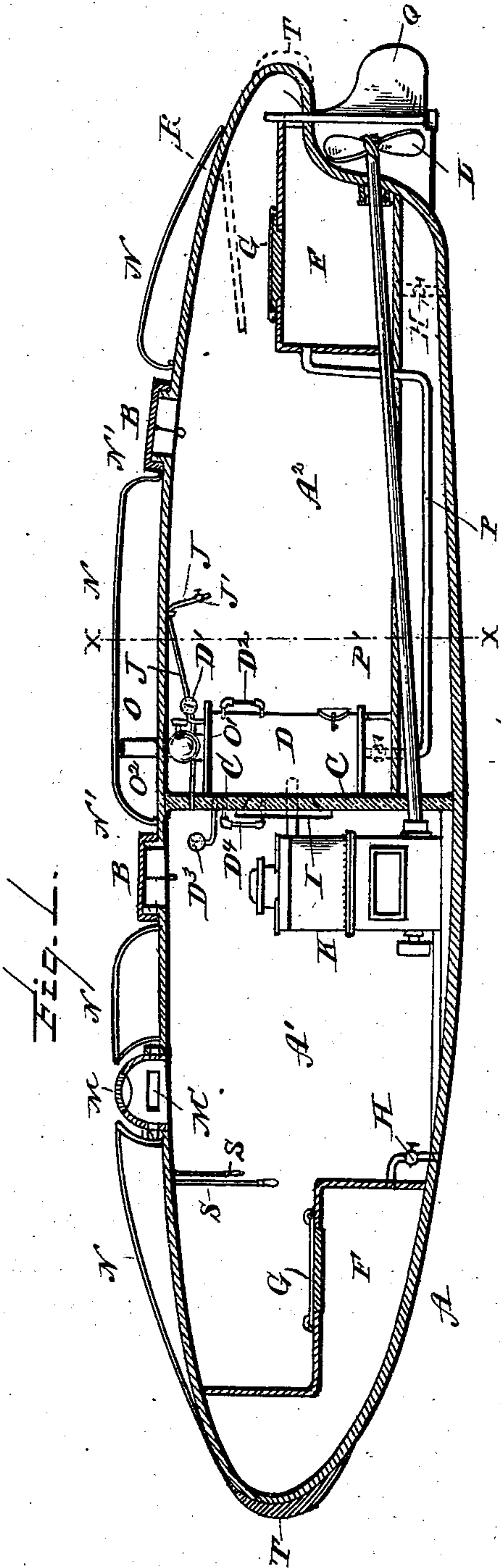
(No Model.)

C. DE B. SHEPARD.

SUBMARINE VESSEL.

No. 379,992.

Patented Mar. 27, 1888.



WITNESSES
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UNITED STATES PATENT OFFICE.

CHARLES DE B. SHEPARD, OF MAMARONECK, NEW YORK.

SUBMARINE VESSEL.

SPECIFICATION forming part of Letters Patent No. 379,992, dated March 27, 1888.

Application filed September 18, 1886. Serial No. 213,922. (No model.)

To all whom it may concern:

Be it known that I, CHARLES DE B. SHEPARD, a citizen of the United States, residing at Mamaroneck, in the county of Westchester, State of New York, have invented certain new and useful Improvements in Submarine Vessels, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has relation to submarine vessels of that class which are adapted to travel upon and beneath the water, and, as will hereinafter appear, to that special class which is propelled by means of chemical agents, such
15 as caustic soda. My invention is, however, applicable to vessels of the classes mentioned whatever means are employed for propelling and controlling the same.

In the use of caustic soda and other chemical
20 motive agents there is great danger to the life of the crew, in that when submerged a leakage at any point of the chemical apparatus lets the poisonous gases escape into the hold of the vessel, which when under water is air-tight,
25 and consequently produces fatal results. In the use of steam as a motive agent the heat produced is in a short time excessively oppressive and destroys the vitality of the air in the hold, so that it is impossible for the crew
30 to remain therein or the vessel to remain submerged for but comparatively short periods.

One of the principal objects of my invention is to so construct a submarine vessel that the above disadvantages are overcome.

35 Another of the principal advantages of my invention, and one of its principal objects, is to so construct a submarine vessel that it may be used upon the surface of the water for cruising and other purposes and at a moment's notice be adapted for diving beneath and traveling
40 along under the water for the purpose of eluding an enemy or to place and discharge torpedoes against and under the water-line of his vessel.

45 To accomplish the first above-mentioned object, I provide what I term a "life-partition," separating the vessel into two principal compartments, in one of which is located and properly arranged the propelling apparatus and
50 in the other the controlling devices. The life-partition is provided with a suitable door or doors closing a passage or passages in such a

manner that neither air, gas, steam, nor heat can escape from one compartment to the other when said door or doors are closed. By the
55 same construction not only is the contamination of the air in the controlling-compartment (by poisonous gases escaping from a leak in the chemical apparatus employed or by excessive heat from any other motive agent) prevented,
60 but when cruising upon the water coal, petroleum, or other hydrocarbon fuel may be employed, as in ordinary surface-vessels, (both compartments being open to the atmosphere.) Any engine of approved form or type may be
65 employed, and hence the capacity for traveling long distances is given to submarine vessels—a matter of vast importance.

To attain the second above-mentioned object of my invention, I provide, in addition to
70 my life-partition, bunkers for coal or tanks for oil, which are adapted to be filled with water, so that when the coal is exhausted from a bunker, and as the oil or other hydrocarbon fuel is drawn from said tank or tanks, water
75 may be let, or, if desired, forced by any suitable means, into said bunker or tank, whereby the ballast of the vessel is substantially maintained as a uniform quantity. In this manner,
80 instead of carrying an otherwise useless ballast, I utilize the usually limited capacity of a submarine vessel for storage of fuel, and, although such expediences are not broadly new with me, I have herein shown, described,
85 and claimed a novel construction whereby are availed advantages thereof in a submarine vessel, said advantages being secured without depreciating its diving and submerged traveling capacities, and also its adaptability to be
90 quickly transformed for travel either upon or beneath the water.

No claim is made herein to either the chemical or steam motive apparatus shown, as they may be of any approved type.

In using the steam it is produced by the
95 combustion of coal, taken from any of the bunkers provided, or of oil or other liquid fuel, taken from one or more of the tanks. Now, when occasion requires a dive or a run under water, the fire is left as it is in case coal is
100 used, and in case a liquid fuel is employed it is extinguished or shut off and the exhaust-steam is directed into the jacket surrounding the boiler, and into said jacket the chemical

employed is conducted to continue the production of steam. The engineer, who has hitherto occupied the propelling compartment, now shuts off his smoke-stack, closes down his hatch, and then passes from the propelling-compartment through one of the doors of the partition into the controlling-compartment and closes the door, (thus shutting out all heat and all poisonous gases which by accident or otherwise might escape into the propelling-compartment,) when, by reason of the arrangement of the engine and steam and water gages, he is enabled to control said engine and the supply of steam thereto free from contaminated atmosphere. After a dive and run under the surface the vessel is aired by first opening the hatch of the controlling-compartment, and then the engineer passes through the door of the partition out to the propelling-compartment and again starts his fire.

The further details of the operation and the means employed by me in an embodiment of my invention are hereinafter more particularly described in connection with the drawings, in which—

Figure 1 is a longitudinal vertical section of a submarine vessel constructed in accordance with my invention. Fig. 2 is a transverse vertical section taken on the line X X of Fig. 1. Fig. 3 is a sectional view of my hatch open, and Fig. 4 a like view of the hatch closed.

Like letters refer to like parts in all the figures.

A represents the hull of the vessel, which hull may be designated as fish-shaped, and B represents the hatches, around the rim of each of which I secure a flexible rubber or other collapsible tube, B', which has at its upper end a frame, B², which serves to keep the tube in form when elevated or distended, as shown in Fig. 3, by means of a brace or rod, B³, which is retained in position by resting upon the floor of the hold, or in any other desired manner. The object of the tube or guard B' is to prevent the water from flowing down the hatchway when open. When closed, the guard is folded upon itself, as shown in Fig. 4.

C represents what I have termed a "life-partition," and it may be made of any suitable material, and, if desired, of a heat-non-conducting material. The partition C divides the hull into compartments, in one of which is arranged the steam-boiler D, provided with a steam-gage, D', and a water-gage, D², and also with like gages, D³ D⁴, which are located in the other or vessel and motor controlling compartment, A'. In the propelling-compartment A² is also arranged the chemical-tank E. Bunkers or tanks F are provided at such parts of the vessel as are suitable for ballasting-chambers.

G represents doors for putting solid fuel into the tanks, and H represents pipes having suitable cocks for letting water into said tanks when drawing, or during the withdrawal of the fuel therefrom.

I represents doors for closing passages in the partition C.

J represents a breathing-pipe leading from the compartment A² to the compartment A', which pipe is provided with a stop-cock, J', whereby the engineer may at will obtain fresh air from the compartment A'.

K represents any suitable engine or motor for running the propeller.

M is the turret or outlook, provided with sight-glasses M'. The partition C prevents collapsing when at low depths.

A fin or guard, N, is arranged along the upper deck from nose to stern and has depressions N', which will take onto the keel of a vessel. The fin is made in sections, and serves to protect the turret smoke-stack and hatches when they approach the bottom of a vessel.

The smoke-stack O is provided with a stop-cock, O', and with a drain-vent, O², for letting all water above the cock out of the stack.

The operation of the invention will be readily understood from the description already given. The fuel, if liquid, is supplied to the boiler by the pipe P, provided with a stop-cock, P', and when ignited serves to produce steam, which runs the motor, while the rudders Q and horizontal blades R are operated by the tiller-ropes S S to guide and otherwise control the vessel.

T is a rubber or other bumper arranged at the nose or stern to prevent shocks in case of a collision.

No claim is herein made to the fin N herein shown and described, as it forms the subject-matter of a companion application, No. 212,061, filed August 28, 1886.

What I claim is—

1. A submarine vessel constructed for the accommodation of a crew and provided with a motor-operating-fluid generator, controlling devices for the same, a propelling mechanism operated by the motor, and with an air-tight partition separating the generator from its controlling devices and having a passage and a door for closing the same, whereby the deleterious effect of the generator upon the air within a portion of the vessel occupied by the crew is prevented, and whereby, also, direct access is had to the generator without the necessity of bringing the vessel to the surface, substantially as specified.

2. In a submarine vessel, a partition provided with a door, and located and arranged to divide the same into two principal compartments, one having therein the heat, steam, and gas producing apparatus, and the other having therein the controlling devices of said apparatus and the motor and vessel controlling mechanisms, whereby the latter compartment is separated from the air-contaminating effects of the apparatus in the former, substantially as specified.

3. In a submarine vessel, a partition provided with a door and forming two separate compartments, and having in one of said compartments the vessel-controlling appliances,

the engine or motor controlling devices, steam and water gages connected with the boiler, and in the other of said compartments the boiler and its remaining appliances, substantially as specified.

4. In a submarine vessel, a liquid-fuel tank, a pipe for conducting said fuel to the boiler, and a pipe passing through the hull for admitting water into said fuel-tank, substantially as specified.

5. In a submarine vessel, a fuel-tank provided with a water-tight trap or door, and with a pipe passing through the hull for admitting water therein, whereby said tank is adapted to store either solid or liquid fuel, and to also serve as a water-ballast chamber, substantially as specified.

6. In a submarine vessel, a hatchway provided with a collapsible water-guard and a movable rigid device for maintaining the same in an elevated position, in combination with

a hatch for inclosing the guard, substantially as specified.

7. In a submarine vessel constructed for the accommodation of a crew therein, a motor-operating-fluid generator, a motor and propelling mechanism connected therewith, and an air-tight partition arranged between the generator and motor and provided with a breathing-pipe, whereby the better air of one compartment may be inhaled by an occupant of the other, substantially as specified.

8. In a submarine vessel, a smoke-stack provided with a stop-cock and with a drain-vent, substantially as specified.

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

CHAS. DE B. SHEPARD.

Witnesses:

E. B. STOCKING,
L. C. HILLS.