

No. 756,030.

PATENTED MAR. 29, 1904.

S. LAKE.
SUBMARINE BOAT.

APPLICATION FILED FEB. 15, 1902.

NO MODEL.

Fig. 1.

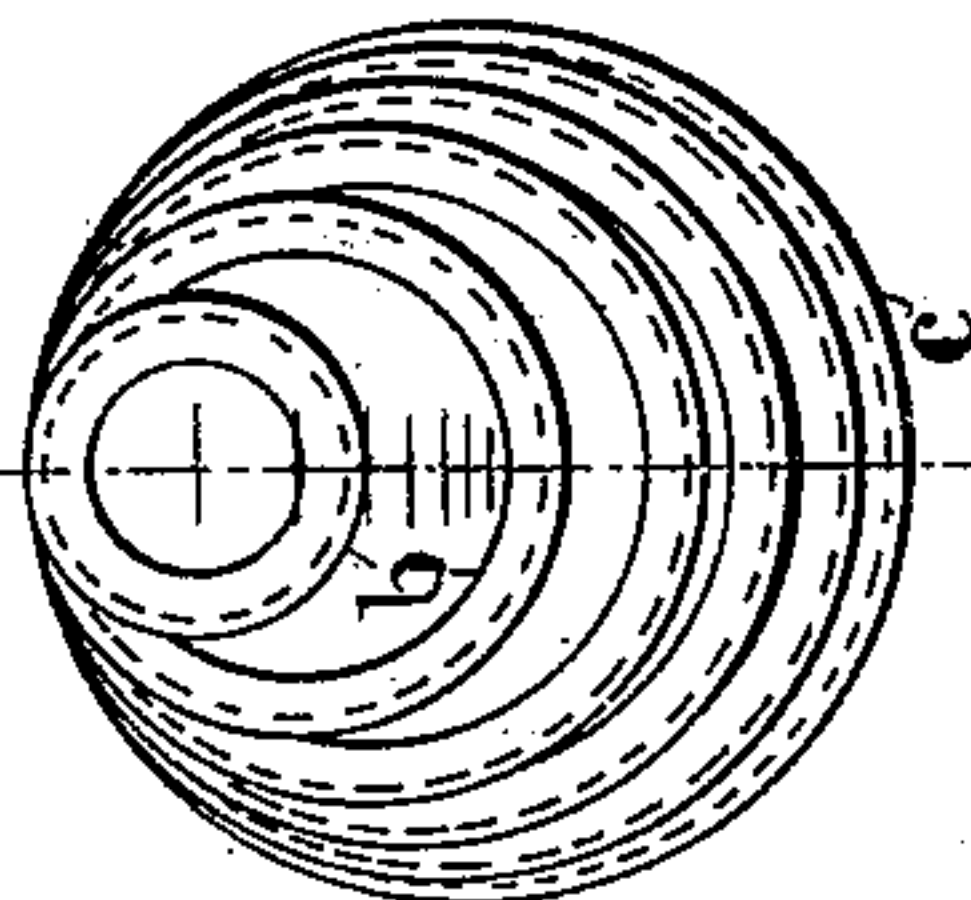
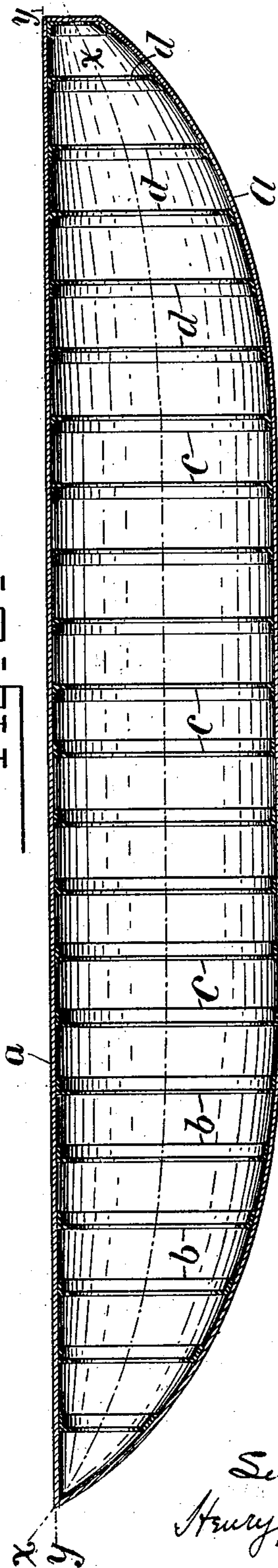


Fig. 2.



WITNESSES:

H. R. Komemann.

Joseph F. Jagwitz

INVENTOR:

S. Lake, by
Henry J. Miller,
his Attorney.

UNITED STATES PATENT OFFICE.

SIMON LAKE, OF BRIDGEPORT, CONNECTICUT.

SUBMARINE BOAT.

SPECIFICATION forming part of Letters Patent No. 756,030, dated March 29, 1904.

Application filed February 15, 1902. Serial No. 94,203. (No model.)

To all whom it may concern:

Be it known that I, SIMON LAKE, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in the Construction of Submarine Boats, of which the following is a specification.

In the construction of submarine torpedo-boats adapted for cruising in company with other war vessels designed for surface navigation only in addition to a capability to perform their normal functions when partially or wholly submerged it is of the greatest importance that the hulls be designed to afford the fine lines which are essential for speed and to afford the necessary room for the convenient manipulation of their various apparatus and for ample accommodation for their crews.

To this end the present invention relates to a novel construction of the hull, whereby without reducing its capacity to resist high external water-pressures the same is adapted to take such lines as will insure under ordinary motive powers a surface speed commensurate with that of surface-cruising naval vessels. It has been found in practice that with a boat having a hull of circular cross-section throughout its length and formed upon a straight axial line in accordance with the practice followed heretofore navigation, particularly upon the surface, was greatly retarded by the creation of "dead water" formed in eddies astern thereof tending inwardly from the sides toward the path of the screw-propeller, so that the boat has been compelled to carry with it a large volume of water in its wake in which the screw operates, and thereby surrender all possibility of the attainment of even moderate rates of speed.

By my present improvement I form the stern portion of a shape of cross-section corresponding with the midship section, but upon an upwardly-inclined center or axial line, by which this current of water may be diverted from the axial line of the screw or screws in such manner as to cause the latter to operate in practically still water, where it can attain the same degree of efficiency as the screw of a surface vessel, the lines of the hull being otherwise

more conducive to requirements as to speed. The capability of the boat for high speeds when engaged in surface cruising is still further increased by giving a similar upward inclination to the center or axial line in the forward portion of the hull.

In accordance with the present invention the vessel is constructed with series of preferably circular transverse frames comprising an intermediate series of cylindrically-arranged frames, adjoining the end members of which are series of smaller frames of gradually-diminishing sizes in upwardly-inclined conical arrangement, the usual skin plates being secured to such frames as so arranged.

The invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is an end elevation representing the forward series of transverse frames of the hull in front view; and Fig. 2 is a vertical longitudinal section representing the front, intermediate, and rear series of frames with the skin plates attached thereto.

The hull *a* is of rounded or circular cross-section throughout its length and is shown constructed with a substantially uniform series of larger circular intermediate frames *c* in cylindrical arrangement and series of smaller frames *b* and *d*, respectively, of gradually-diminishing sizes in upwardly-inclined conical arrangement adjoining the opposite end members of the series of frames *c*, the top of each frame being upon substantially the same level, while their centers are arranged in a center or axial line upwardly inclined and preferably curved, as indicated by the dotted line *x x* in Fig. 2, toward the substantially horizontal line *y y* through their uppermost points, which it intersects at the bow and stern, respectively. When viewed from either end, as in Fig. 1, the several frames present series of eccentric rings, of which the extreme upper portions have a common point of tangency, and their centers are progressively arranged in respect of that of the midship section in a vertical longitudinal plane passing through each, the center of the smallest being at the top and that of the largest at the bottom of the series. The skin or sheathing

plates are applied to these frames in the usual manner, the outer surface of the hull being shown in the drawings as terminating in a point at the bow, but having the apex of the conical stern portion cut away to form a slightly-flattened extremity, which latter slight deviation from the shape of the bow portion is obviously not material to the general form and consequent efficiency of the hull. While the boat is herein shown as constructed with series of circular frames throughout its length, it is evident that the improvement contemplates any suitable style of framing and curved cross-section adapted to resist the external water-pressure to which boats of this class are necessarily exposed.

While the claims appended hereto define the intermediate and contracted end portions of the hull as "cylindrical" and "conical," respectively, it is to be understood that such terms as herein employed are not intended to limit the scope of such claims to embrace only vessels of circular cross-section, but are designed to indicate a form comprising some regular closed figure of continuous circumferential curvature, such as an oval, which is a well-known form of cross-section for submarine boats, affording a capability of resisting great external water - pressures for which other well-known forms of hull which are frequently adopted for surface vessels are unadapted. This peculiar form of hull adapts the boat for efficient propulsion, especially when cruising upon the surface, by obviating the formation of dead water and avoiding

the suction of air downward to the path of movement of the screws and so causing an excessive slip of the latter and corresponding reduction of their efficiency.

Having thus set forth the nature of the invention, what I claim herein, and desire to secure by Letters Patent, is—

1. A hull construction for submarine boats comprising series of transverse frames each in the form of a regular closed figure of continuous circumferential curvature, and disposed with a substantially uniform series of larger intermediate frames in cylindrical arrangement and series of smaller frames of gradually-diminishing sizes in upwardly-inclined conical arrangement adjoining the opposite end members of said cylindrically-arranged series of intermediate frames.

2. A hull construction for submarine boats comprising series of circular transverse frames, disposed with a substantially uniform series of larger intermediate frames in cylindrical arrangement and series of smaller frames of gradually-diminishing sizes in upwardly-inclined conical arrangement adjoining the opposite end members of said cylindrically - arranged series of intermediate frames.

Signed at Elizabeth, in the county of Union and State of New Jersey, this 6th day of February, A. D. 1902.

SIMON LAKE.

Witnesses:

L. B. MILLER,
HENRY J. MILLER.