

(No Model.)

M. HUBBE & M. A. HARDY.

SUBMARINE TORPEDO.

No. 255,386.

Patented Mar. 21, 1882.

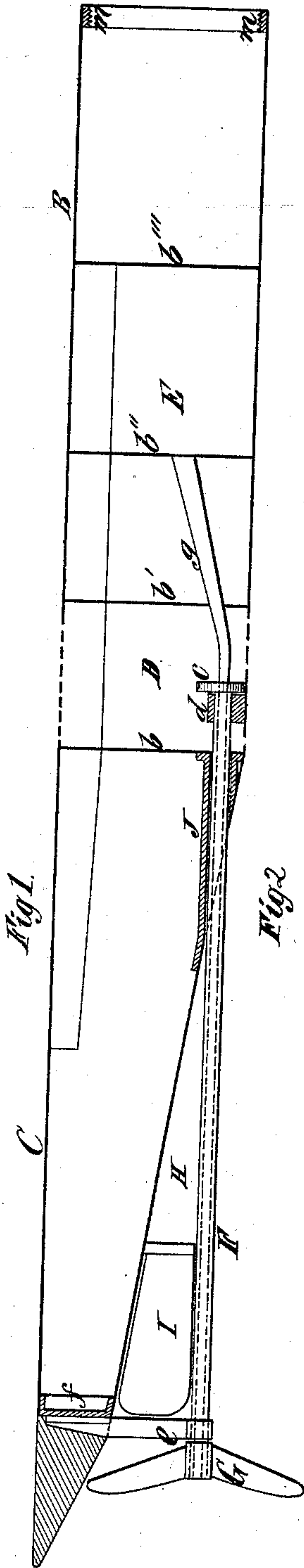


Fig. 1.

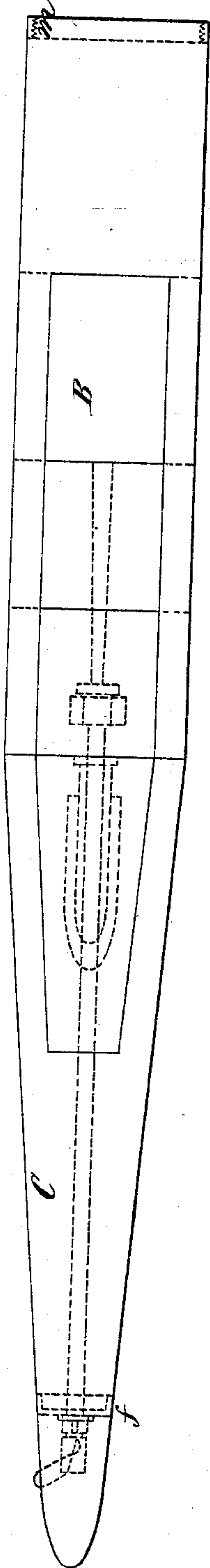


Fig. 2.

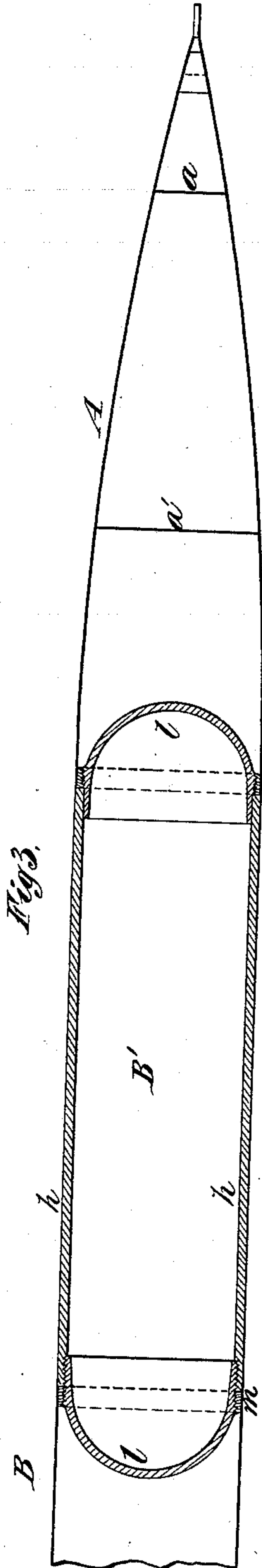


Fig. 3.

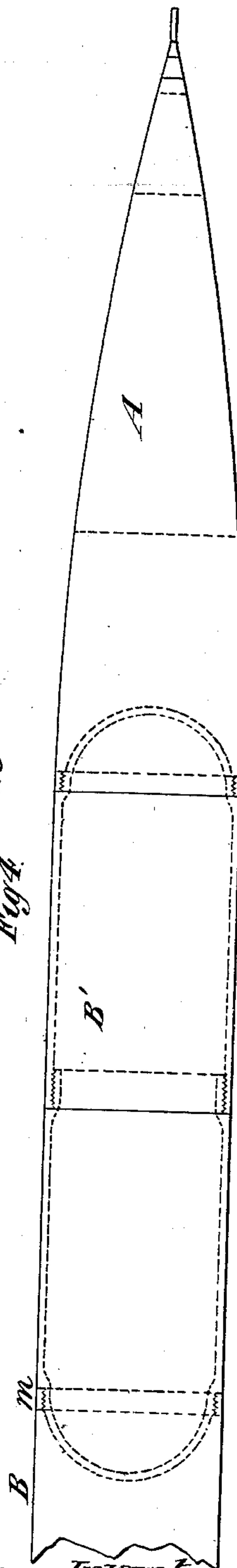


Fig. 4.

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UNITED STATES PATENT OFFICE.

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SUBMARINE TORPEDO.

SPECIFICATION forming part of Letters Patent No. 255,386, dated March 21, 1882.

Application filed July 21, 1881. (No model.)

To all whom it may concern:

Be it known that we, MARTIN HUBBE, of Bayonne, in the county of Hudson and State of New Jersey, and MARCUS A. HARDY, of Newport, in the county of Newport and State of Rhode Island, have invented certain new and useful Improvements in Submarine Torpedoes, of which the following is a specification.

Our invention principally relates to self-propelling torpedoes in which the motive power is furnished by compressing air or gas in a reservoir in said torpedo.

One feature of our invention is applicable only to torpedoes in which the engine is contained in a compartment which is filled with water and in communication with the surrounding element; and it consists in the combination, in a torpedo, of a water-compartment for an engine having holes for the entrance of water, a screw-shaft extending therefrom, and a tube leading aft from said compartment to the exterior of the hull and loosely surrounding the screw-shaft, whereby the necessity of any stuffing-box for the said shaft is obviated and power which has been heretofore consumed by friction is saved.

Other features of our invention consist in certain novel details in the construction of the flask or reservoir in which air or gas is to be compressed to serve as a motive power, and in the manner of securing the said flask or reservoir in the torpedo so that it forms a portion of the hull thereof.

In the accompanying drawings we have divided the hull, showing only one-half the length in each figure, on account of its great length and comparatively small diameter.

Figures 1 and 3 together represent a central longitudinal section of the whole torpedo, and Figs. 2 and 4 represent a plan thereof, with a flask or reservoir for gas or air, of slightly-modified construction, which, however, forms no part of our present invention.

Similar letters of reference designate corresponding parts in all the figures.

The hull of the torpedo is composed entirely, or nearly entirely, of sheet metal, and comprises a spindle or cigar shaped bow-section, A, a cylindric middle section, B, and a conical stern or after section, C. The bow or forward

section, A, comprises a magazine for the explosive charge, formed by bulk-heads *a a'*, and possesses in itself no novel features. The cylindric middle section, B, comprises a flask or reservoir, *B'*, and may be divided into as many separate compartments as may be desirable. As here represented, it is divided back of the flask or reservoir *B'* by bulk-heads *b b'*, *b'' b'''*, to form four compartments, in one of which, D, may be contained the propelling-engine, another, E, of which may be used as a coil-chamber, from which an electric cable is paid out as the torpedo moves forward, and the other two of which may serve for any other useful purpose.

F designates a screw-shaft, which is provided at its inner end with a spur-gear, *c*, through which motion may be imparted to it, and G designates an ordinary screw-propeller mounted upon said shaft. The shaft F is mounted in a suitable inboard bearing, *d*, in the engine-compartment D, and a stem-bearing supported by a hanger, *e*, which is shown as secured to and depending from a bulk-head, *f*, near the end of the conical stern or after section C. The said shaft extends rearward from the engine-compartment through the conical section C and out upon the under side thereof.

From Fig. 1 it will be clearly seen that the conical stern or after section C, is connected to the middle section, B, so that the upper sides of the two sections are in line, or nearly in line, and that the under side of the after or stern section C tapers quickly rearwardly and upwardly from its union with said middle section. This mode of construction is very advantageous, because the buoyancy of the hull at the top is much increased, because the screw G may be arranged beneath and under cover of the hull, and because said screw projects so much below the bottom of the hull that it may work in solid water, thus greatly increasing the speed of the torpedo and effecting a saving of power, which in a boat of this kind is of the utmost importance.

Between the under side of the conical stern or after section C and the screw-shaft F is arranged a triangular skag or keel, H, and back of this is arranged the rudder I, which is thereby greatly protected from injury.

The sides of the compartment D which con-

tains the engine are perforated; or the said compartment is otherwise constructed so as to afford communication with the surrounding element and permit a free circulation of water through the compartment, thus cooling all parts of the engine and effectually preventing the heating of all the movable parts. From the said engine-compartment D rearwardly to the exterior of the hull extends a tube, J, open at its inner and outer ends and of sufficient size to allow the screw-shaft F to pass through it, thus forming a water-tight passage for the shaft through the conical after section C. Inasmuch as the said compartment D is always full of water, no stuffing-boxes are needed at the ends of said tubes, and the power ordinarily consumed by the friction of the screw-shaft in its stuffing box is saved, while water can pass through the tube around the shaft.

In order to prevent any lines, cables, weeds, or grass from being wound around the shaft F and fouling it, we may inclose the shaft within a stationary tube extending from the end of the tube J to the stern-bearing *e*.

From the compartment E a tube, *g*, extends rearwardly, preferably through the propeller-shaft, which is hollow for its reception, and through this tube the cable from the coil-chamber is paid out, and the entanglement or fouling of said cable in the screw or by the rudder is prevented.

We will now describe the construction of the flask or reservoir B' for air or gas. It is composed of a cylindric body portion, *h*, and separate heads *l l*, preferably convex or hemispherical, secured therein, as shown in Fig. 3. Where the flask or reservoir is composed of the straight cylindric body *h* and the separate heads *l l* the heads may be secured in the body in any suitable manner. Two methods of making this connection or joint are shown in Fig. 3, one end of the cylindric body *h* being internally screw-threaded and the head being externally screw-threaded to engage therewith, while the other end of said body is made slightly flaring or taper internally, and the head is made with a corresponding external taper fitting in said internal taper, and secured therein by brazing or soldering.

In order to provide for securing the flask or reservoir B' to the portions of the hull upon each side thereof, we insert in the ends of the

portions of the hull to which the flask or reservoir is to be connected rings *m*, which are internally screw-threaded, and we construct the heads *l* of the flask or reservoir B' with external screw-threads to engage with said internal screw-threads. This method of connecting the flask or reservoir with the sections of the hull upon each side thereof is very desirable, inasmuch as it provides for removing the flask or reservoir and replacing it with another, if necessary.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in a movable torpedo, of a water-compartment for an engine, having openings for the admission of water to it, a screw-shaft extending therefrom, and a tube leading aft from said compartment to the exterior of the hull and loosely surrounding said screw-shaft, substantially as specified.

2. The combination of the middle section, B, comprising a water-compartment, D, for an engine, the conical after or stern section C, arranged with its upper side in line with the upper side of the section B, the screw-shaft F, and the tube J, affording provision for the circulation of water from said compartment D around the screw-shaft, substantially as specified.

3. The combination, in the hull of a movable torpedo, of two cylindric or annular sections and an interposed flask or reservoir having heads made separate from its body and inserted into its body, the said heads being also inserted into the sections between which the flask or reservoir is placed, and secured therein at the circumference, substantially as specified.

4. The combination, in the hull of a torpedo, of two cylindric or annular sections, A B, each having in its end an internally screw-threaded ring, *m*, and the interposed flask or reservoir B', composed of the body *h* and separate heads *l l*, provided with external screw-threads for engaging with the internally screw-threaded rings *m*, substantially as specified.

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