To all whom it may concern:

Be it known that I, JOSEPH BARRAJA-FRAUENFELDER, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented new and useful Improvements in Submarine Torpedo-Boats, of which the following is a specification.

Heretofore, in the construction of submarine torpedo boats installed with after or stern torpedo tubes, it has been the practice to provide fairwater doors for controlling the torpedo exits in the hull so as to provide smooth water surfaces on the sides of the boat. In the constructions wherein the torpedo tubes are arranged in vertical alignment with the longitudinal axis of the boat so as to discharge directly through the stern, two fairwater doors are employed and are arranged to open outwardly prior to the discharge of a torpedo. Such construction, however, has been found objectionable, since eddies are immediately formed the moment the doors are opened which tend to retard the speed of the boat and to disturb the course of the torpedo since the water will back up into the recess formed by the open doors in an agitated condition.

The object of the invention is to provide a construction to avoid the above stated objections and one in which greater strength of the stern is provided, and greater protection is given the outboard or muzzle ends of the tubes, their covers and their operating gear than in the constructions now employed, the construction and arrangement being such that all gears and other operating mechanism employed for opening and closing the fairwater doors are dispensed with.

The invention comprises certain novel features of construction, and novel combinations and arrangement of parts as will be hereinafter fully described and claimed.

In the drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1, is a diagrammatic side elevation of the after end of a submarine torpedo boat embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is an end view. Fig. 4 is a transverse section drawn on the line 4—4 of Fig. 5. Fig. 5 is a vertical longitudinal section drawn on the line 5—5 of Fig. 6, 55 the torpedo tube and its outboard or muzzle cover and its operating gear being shown in elevation. Fig. 6 is a horizontal section drawn on the line 6—6 of Fig. 5, the tube being shown in elevation. Fig. 7 is a transverse section drawn on the line 7—7 of Fig. 5. Fig. 8 is a diagrammatic sectional elevation illustrating a slightly modified construction. Fig. 9 is a diagrammatic sectional elevation illustrating the arrangement of fairwater doors now employed for incasing the breech ends of the tubes, the doors being shown open in dotted lines illustrating the formation of eddies that are set up when the doors are open.

1 designates the after end of the main hull of a submarine or submersible torpedo boat which is constructed as usual, of shell plating 2 and ribs 3, which are of sufficient strength to withstand the external pressure incident to submergence. 4 designates the stern section of the boat, likewise constructed of shell plating 5 and ribs 6, but since this section of the boat will be open to the surrounding body of water, as will be hereinafter described, and hence not subjected to external pressure, the plating and ribs are preferably of lighter weight material than that of the main hull. The end of the main hull 1, is closed by a bulk-head 7, through which is extended the muzzle end of a torpedo tube 8, the said muzzle end being controlled by a cover 9, hinged to an arm 10, carried by a transverse shaft 11 mounted in brackets 12 extending from the outer end of the tube. One end of the shaft 11, is provided with a segmental worm wheel 13 which is meshed by a worm 14 carried at the outer end of an operating shaft 15 extended through the bulk-head 7, and operable from the breech end of the tube. The worm-wheel and worm are shown in dotted lines in Fig. 5 of the drawings, and are enclosed in a water tight casing 16 to prevent the introduction of any foreign matter which would tend to clog them.

The stern section 4, in addition to the plating 5 and ribs 6, is constructed with a casing 17, comprising a vertical post 17 to which the outer ends of the platings 5 are connected, said post having inwardly extending diverging arms 18, to which the ribs are also connected, the said arms having recesses in
which the ribs are seated. The stern post 17 is formed with a cylindrical flanged opening 18 of substantially the diameter of the periphery of the torpedo tube and having its center located in longitudinal alinement with the longitudinal center of said tube. The platings 5 between the post 17 and the after rib 6, and also the said rib, are bowed outwardly as at 5' to conform to the radius of the opening 18', thus providing a cylindrical section in the stern as shown, and between the said rib 6' and its adjacent rib 6, the side plates are cut out as at 19 so as to permit water to flow into and through the said cylindrical section when the boat is in motion either upon or below the surface of the water.

In Fig. 8, of the drawings I show a slight modification of construction in which the stern post is dispensed with but the side plates are bowed outwardly as at 20 in the same manner as that described with reference to the construction shown in the main figures of the drawings, the forward ends of the bowed sections being open to the water as at 20'.

From the foregoing it will be seen that during the forward movement of the boat water will enter through the openings 19 or 20' and run out through the cylindrical exit of the post 17 hence avoiding the formation of eddies as in the constructions employing fairwater doors or in constructions wherein recesses or pockets are formed in the sides of the hull or stern of the boat at the muzzle ends of the torpedo tubes so that speed resisting tendencies and possible deflection of the direction of course of a torpedo when fired from a tube is avoided.

By my construction of the stern of a boat with a stern post and its forwardly extended arms, I provide a more rigid structure than has heretofore been devised, and by providing the sides of the stern with openings there is added the further advantage of permitting ready access to the outboard or muzzle ends of the tubes, their covers and operating gear. Furthermore by my construction I avoid the employment of operating mechanism for opening and closing the fairwater doors and hence the possible danger of discharging a torpedo when said doors are closed, since the torpedo will have free exit when the outboard or muzzle cover of the tube is opened.

In order to prevent the formation of eddies at the end of the torpedo tube when the door is closed I arrange a substantially cone-shaped fairwater shell or casing 22 upon the outer face of the cover or door 9 so as to direct the water through the opening 18' and to prevent its backing up against the cover or door. The shell or casing is provided with an opening to receive the arm 10 of the cover.

What I claim is—

1. A submarine torpedo boat, having a torpedo tube opening through the stern thereof, a closure for the muzzle end of the tube, and a cylindrical tubular section 70 formed in the stern section of the boat and open at both ends to the surrounding body of water.

2. A submarine torpedo boat, a torpedo tube arranged in the main hull of the boat 75 and opening through the stern thereof, a closure controlling the muzzle end of the tube, means operable from within the main hull for opening and closing the closure, and a tubular section formed in the stern 80 in alinement with said torpedo tube, said tubular section being open at both ends to the surrounding body of water, substantially as and for the purpose specified.

3. A submarine torpedo boat, comprising a main hull constructed to withstand the pressure incident to submergence and having a stern section open to the water of flotation, said stern section having a cylindrical section open at both ends to the surrounding body of water and serving as a torpedo exit, and a torpedo tube arranged in the main hull in alinement with said cylindrical section and opening within said stern section.

4. A submarine torpedo boat, comprising a main hull constructed to withstand the pressure incident to submergence and having a stern section open to the water of flotation, a cylindrical section formed in said stern providing a torpedo exit, the sides of said stern section having openings arranged therein in advance of said cylindrical section, and a torpedo tube arranged in the main hull of the boat in longitudinal alinement with said cylindrical section and opening into the stern section, a closure for the muzzle end of said tube, and means operable from within the main hull for controlling the position of said closure.

5. A submarine torpedo boat, having a torpedo tube opening through the stern thereof, a cylindrical section formed in said stern in longitudinal alinement with said tube, said cylindrical section being open at both ends to the surrounding body of water, a closure for the muzzle end of the tube, and means operable from within the boat for controlling the position of said closure.

6. In a submarine torpedo boat, a main hull constructed to withstand the pressure incident to submergence, and a stern section formed integral therewith and open to the surrounding body of water, said stern section comprising a stern post provided with forwardly extending arms, ribs carried by said arms, and shell platings connected to said stern post, to said arms, and to said ribs.

7. A submarine torpedo boat, comprising
a main hull constructed to withstand pressure incident to submergence, a stern section of relatively light weight material formed on the end of the main hull and open to the surrounding body of water, a torpedo tube arranged in said main hull and opening into said stern section, a cylindrical section formed in said stern in longitudinal alignment with said torpedo tube, said cylindrical section being open at both ends to the surrounding body of water, a closure for the muzzle end of the torpedo tube, and means for operating said closure.

8. A submarine torpedo boat, comprising a main hull section constructed to withstand pressure incident to submergence, and a stern section open to the surrounding body of water, said stern section comprising a stern post having a cylindrical opening and forwardly extending arms, ribs connected to said arms, and shell platings connected to said stern post, arms and ribs, said shell platings having bowed sides conforming to the shape of said stern post opening and having openings in advance of said bowed portions, a torpedo tube arranged in the main hull section in longitudinal alignment with said stern post opening, a door for closing the muzzle end of said torpedo tube, and means operable from within the main hull for opening and closing said door.

9. A submarine torpedo boat, having a torpedo tube opening through the stern thereof, a closure for the muzzle end of the tube, a cylindrical torpedo exit formed in the stern section of the boat and open at both ends to the surrounding body of water, and a fairwater shell or casing carried by the torpedo tube closure.

10. A submarine torpedo boat, having a torpedo tube opening through the stern thereof, a closure for the muzzle end of the tube, a cylindrical torpedo exit formed in the stern of the boat and open at both ends to the surrounding body of water, and a substantially cone-shape fairwater casing or shell carried by the torpedo tube closure.

In testimony whereof I have hereunto set my hand this 22nd day of August, A. D. 1919.

JOSEPH BARRAJA-FRAUENFELDER.

Witnesses:
F. S. GOODELL.
EMERY W. EATON.