P. J. HEDLUND.

TORPEDO.

APPLICATION FILED DEC. 21, 1907.

906,133. Patented Dec. 8, 1908.

Fig. 1.

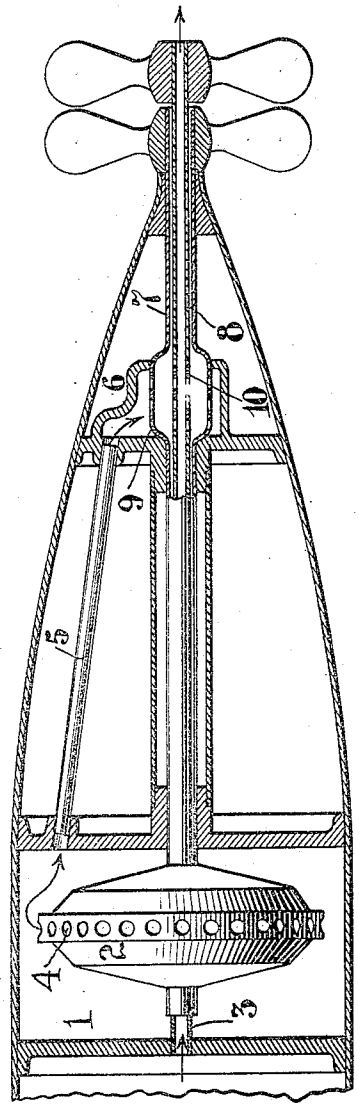
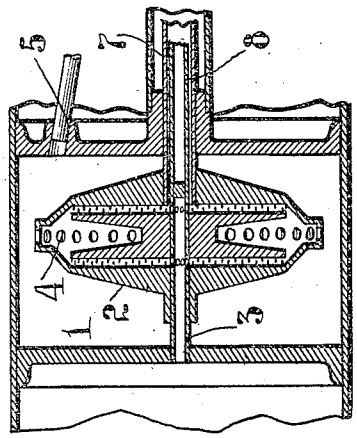


Fig. 2.



Attest:

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UNITED STATES PATENT OFFICE.

PER JOHAN HEDLUND, OF STOCKHOLM, SWEDEN.

TORPEDO.

No. 906,133. Specification of Letters Patent. Patented Dec. 8, 1908.

Application filed December 21, 1907. Serial No. 407,592.

To all whom it may concern:

Be it known that I, PER JOHAN HEDLUND, engineer, subject of Sweden, residing at Jarla, Stockholm, Sweden, have invented new and useful Improvements in Torpedoes, of which the following is a specification.

This invention relates to torpedoes driven by elastic fluid turbines, and particularly to torpedoes employing turbines having two rotating driving members, for example, a wheel and a casing, each driving a propeller shaft. Such a turbine is shown for example in the patent to Dalen No. 888,390, dated May 19, 1908. In such turbines the motive fluid is usually exhausted directly to the outside, it being inconvenient to connect exhaust pipes directly to such turbines, and the object of my invention is to provide means for discharging the exhaust from such turbines outside the torpedo without providing valves to permit such discharge while preventing entrance of water.

According to my invention I inclose the turbine within a chamber of its own inside the torpedo and separate from the air tanks of the torpedo, the turbine exhausting directly into this chamber; and I connect this chamber by a suitable duct to a chamber surrounding a perforated portion of the two concentric propeller shafts, the inner of which as well as the outer, is tubular, the exhaust being conveyed therefore to the inner of the two propeller shafts and discharged therethrough.

The accompanying drawing illustrates a torpedo such as referred to.

In said drawings: Figure 1 shows a longitudinal section of the rear portion of a torpedo embodying my invention; and Fig. 2 is a similar fragmentary section showing in section a turbine such as may be used in my torpedo.

In said drawing, 1 designates the turbine compartment of the torpedo and 2 a turbine of the class described, that is to say, a turbine the casing of which, as well as the interior rotor of which, rotates.

3 designates a hollow trunnion shaft forming one of the supports of the turbine and through which motive fluid is conducted into the turbine.

7 and 8 designate respectively, the outer and the inner propeller shafts, both hollow as shown, the outer shaft 7 likewise serving as a support for the turbine.

The turbine casing is provided with a number of exhaust holes 4; through which the motor fluid is exhausted into compartment 1.

In Fig. 2 I have illustrated more or less diagrammatically a turbine such as may be used in this torpedo, though it is to be understood that I do not limit myself to any particular turbine since the turbine itself forms no portion of this invention.

A chamber 6 surrounds a portion of the propeller shafts 7 and 8, the portions of said shafts lying within this chamber having in them perforations 9 and 10; and this chamber 6 in connected to the turbine compartment 1 by a duct 5 serving to convey the exhaust from the turbine compartment 1 to the perforations 9 and 10 of the propeller shafts, the exhaust therefore passing out through the inner shaft 8.

With the construction shown it will be clear that the turbine casing is as free to rotate as if it were rotating in the external air, the exhaust passing freely into chamber 1 and thence through duct 5 to propeller shaft 8 and so out. At the same time no check valve to prevent entrance of water is required in this propeller shaft or duct 5 or at the discharge opening of the chamber 1; because since the turbine compartment is entirely isolated from the main portion of the torpedo, water can do no harm even if it does enter this compartment. In general water can never enter this compartment until the torpedo has run its course, because the air pressure in compartment 1 would be sufficient to exclude water.

What I claim is:—

A torpedo comprising in combination a hull, concentric hollow propeller shafts, a fluid pressure turbine directly connected to both of said shafts and having a rotary casing connected to the outer of said shafts to drive the same, said hull having a closed compartment containing this turbine, the turbine arranged to exhaust directly into said compartment, a chamber inclosing a

portion of said propeller shafts, and a duct connecting said chamber to the turbine compartment of the hull, the portions of said shafts within said chamber being perforated whereby the exhaust from the turbine passes to the inner propeller shaft and is discharged therethrough.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PER JOHAN HEDLUND

Witnesses:

WALDEMAR BOMAN,

HJALMAR ZETERSTROM.