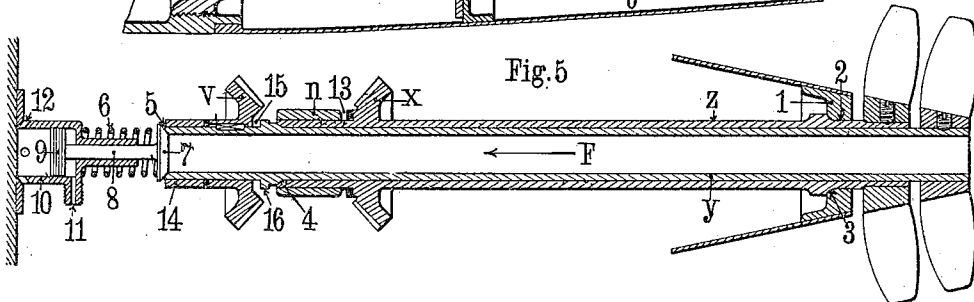
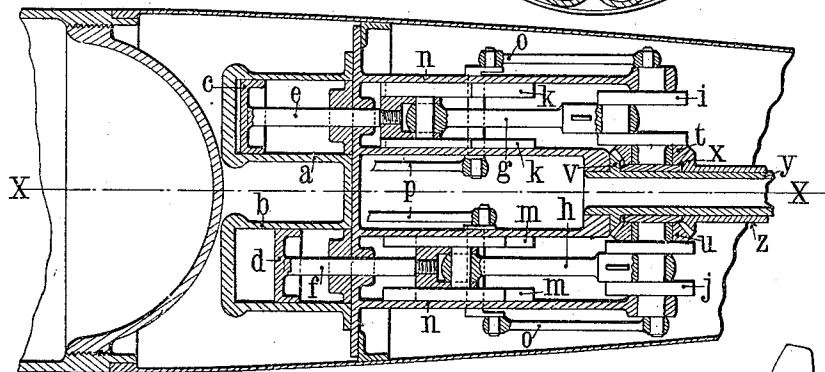
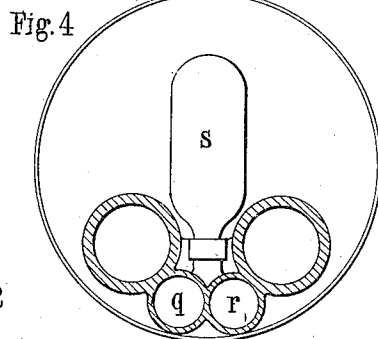
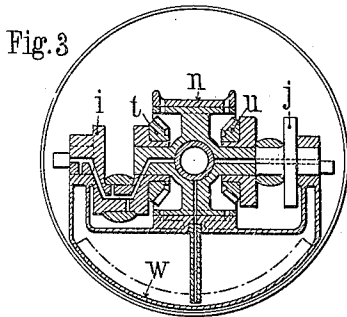
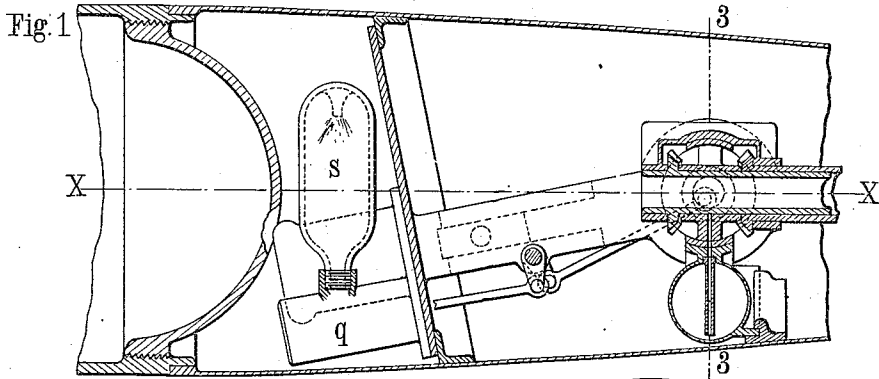


A. E. JONES.
 MEANS FOR THE PROPULSION OF AUTOMOBILE TORPEDOES.
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WITNESSES
E. E. Nolske
J. P. Davis

INVENTOR
Albert E. Jones
 BY *Munn & Co.*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

ALBERT EDWARD JONES, OF FIUME, AUSTRIA-HUNGARY, ASSIGNOR TO MESSRS.
WHITEHEAD AND COMPANY, OF FIUME, AUSTRIA-HUNGARY, A CORPORATION.

MEANS FOR THE PROPULSION OF AUTOMOBILE TORPEDOES.

1,005,647.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT EDWARD JONES, of Fiume, Austria-Hungary, have invented certain new and useful Improvements in and Relating to Improvements in the Means for the Propulsion of Automobile Torpedoes, of which the following is a specification.

This invention has for its object improvements in the means for the propulsion of automobile torpedoes.

Existing motors comprise a group of cylinders arranged radially around the axis of propulsion, the axes of these cylinders being in a plane at right angles to the longitudinal axis of the torpedo. This arrangement presents in particular the two following inconveniences which impair the stability and the efficient running of the torpedo. The uniform distribution of the weight of the motors around the axis of propulsion does not of itself impart to the torpedo an adequate degree of stability and necessitates the employment of ballast. In addition, as the space in which the cylinders are mounted must necessarily be very restricted, in practice it is only possible to employ single-acting cylinders of no great length with a short stroke for the pistons and short connecting rods. The fact that the connecting rod is necessarily very short causes considerable side-thrust on the piston, which, as in all single acting engines, has to serve as the cross-head; further, the piston being also very short, gives very little bearing surface for adequately supporting this thrust; in addition, the shortness of the piston allows it to be easily canted in the cylinder, causing undue wear and abnormal strain.

The present invention has for its object a means of propulsion specially adapted for obviating the defects referred to above while at the same time diminishing the friction due to the passage of the shafts through stuffing boxes. This result is obtained by arranging the axes of the motor cylinders of the group in planes parallel with the longitudinal axis of the torpedo and below the axis of propulsion, with the object of bringing all the reactions of the moving parts into these planes, that is to say in the direction of running, and also of increasing the stability of the torpedo by lowering its center of gravity. This construction allows

of connecting rods and crossheads of normal length. The invention likewise permits of obtaining without the assistance of any stuffing box, particularly when the torpedo is stationary, a hermetic sealing of all the parts.

In the accompanying drawing: Figure 1 is a vertical axial section of the motor chamber of a torpedo embodying the present invention. Fig. 2 is a section on planes at right angles to that in Fig. 1. Fig. 3 is a cross section on the line 3—3 in Fig. 1. Fig. 4 is a section transversely of the motor cylinders. Fig. 5 is an axial longitudinal section of the propeller shafts.

The motor comprises two double acting cylinders *a, b* the axes of which are in symmetrical planes parallel with the longitudinal axis *x—x* of the torpedo below the axis of propulsion and horizontally inclined thereto while their pistons *c, d* transmit the movement by the intermediary of their rods *e, f* and of the connecting rods *g, h* to the cranks *i, j* arranged at the level of the propulsion axis. The connecting rods *g, h* and the piston rods *e, f* are guided by the slide-ways *k, m* formed on the framework *n*.

The drawing shows the eccentric rods *o*, the connecting rods *p* and the valve chests *q, r* and likewise the device *s* for reheating the air. The cranks *i, j* disposed at an angle of 90° one to the other are respectively rigid with two toothed pinions *t, u* which simultaneously transmit the movement to the toothed pinions *v, x* of which the pinion *v* is rigid with the shaft *y* of the rear propeller and the pinion *x* with the shaft *z* of the front propeller of the torpedo.

The lubrication of the engine is effected with oil under pressure contained in a reservoir *w* integral with the framework of the machine, symmetrical relatively to the plane of the vertical axis of the torpedo while its bottom is parallel with the lower part of the hull or shell. A feed pipe *w'* projects from the bottom of the reservoir *w* into the mechanism.

The stern-post 1 of the torpedo is formed with a cylindrical bearing 2 which ends internally in a seating 3, which is preferably conical. The outer shaft *z* carrying the propeller (which shaft passes through this bore) presents a shoulder corresponding to the seating 3 and ends at its inner end in a

seating 4 which is preferably conical. The inner shaft y which is tubular as usual in order to serve as a passage for the discharge of the exhaust air of the motor presents a shoulder which corresponds to the bearing 4 of the shaft z and it ends inside the torpedo in a seat 5 which is preferably conical. A spring 6 applies a valve 7 to this seat, the stem 8 of this valve ending in a piston 9 located inside a chamber 10 provided on one side of this piston with an air admission socket 11 connected with the high pressure air socket of the motor and on the other side with air discharge apertures 12.

The shaft z is adapted to slide in its fixed bearing n to an extent determined by the space 13 separating the pinion x from the bearing n . The shaft y is adapted to slide in the pinion v and in a bearing 14 to an extent determined by the vacant space existing between the pinion v and an annular projection 16 upon the shaft y .

The operation is as follows: When stationary the two shafts z and y are subjected to the thrust of the spring 6; the valve 7 is applied against the seat 5, the shafts y and z bear one against the other by means of the bearing surface 4 and finally the shaft z is applied to the seat 3 in the stern post. These three joints 3, 4 and 5 prevent the admission of water into the torpedo and provide quite as good joints as stuffing boxes. When the torpedo is running, the air under pressure coming from the high pressure socket of the motor passes through the connection 11 into the chamber 10 and forces the piston 9 back which separates the conical valve 7 from its seat 5. At the same time the longitudinal thrust produced by the rotation of the propellers causes the shafts z and y to slide in the direction indicated by the arrow F; in such a manner that the shaft z bears against its bearing n , and the shaft y bears against its bearing 14 and the surfaces forming joints at 3 and 4 separate. The exhaust air from the motor then issues freely through the shaft y and forces back the water which would have a tendency to enter the torpedo. At the same time any binding or undue friction between the shafts z and y and between the shaft z and the stern post disappears automatically owing to the simultaneous release of the joints 3 and 4. There is therefore no unnecessary friction to impede the rotation and the shafts z and y can rotate with perfect freedom.

The bearing face of the bore 2 and the cylindrical joint formed between the two shafts and the pressure of the exhaust air are sufficient to prevent the infiltration of the water during running.

Care must of course be taken to give the space 15 a width rather greater than the space 13 so that the separation can actually

take place at 4; similarly, the pressure of the compressed air entering through 11 into the chamber 10 should be greater than the ambient pressure of the exhaust air and the chamber 10 should be provided with holes such as 12 for the escape of the air forced by the piston 9.

The advantages are as follows:—When the motor is in movement, all the reactions resulting from the displacement of the moving parts are comprised in vertical planes parallel with the vertical plane passing through the longitudinal axis of propulsion, in other words in planes parallel with the direction of running of the torpedo. From this arises the important advantage that all tendency to gyratory movement is eliminated and the movement of the motor does not affect the efficient operation of the torpedo. The arrangement of the motors in longitudinal planes enables them to be better proportioned to requirements, that is to say double acting cylinders can be used which are more powerful cylinder for cylinder than single acting motors and which run more uniformly. The inclination of the motors and of the axis of propulsion toward the bottom of the torpedo brings their weight below this axis and consequently increases the stability of the torpedo in lowering its center of gravity. The special form and arrangement of the oil reservoir likewise assist in insuring this stability, in particular because the center of gravity of the mass of oil remains constantly in the vertical axial plane of the torpedo for all degrees of consumption. These arrangements as a whole almost permit of dispensing with the ballast generally necessary and of utilizing the space left free above the motor for the reception of other parts. Finally Figs. 1 and 4 show that the air reheater s is in very direct communication with the distributing chests q and r which avoids leakage and provides a more efficient distribution of the heat. In repose the means for forming a tight joint around the line of shafts provides a joint which is quite as perfect as when stuffing boxes are used. In running an equally good joint is formed with the additional advantage that the frictional pressures which cannot be avoided with stuffing boxes are completely obviated.

The valve 7 may serve as a sinking valve if a hook is fitted to it in order to prevent it from returning to its seat when once it has been opened.

It will of course be understood that motors of any kind capable of being arranged in planes parallel with the longitudinal axis of the torpedo and below the propulsion axis may be employed.

Having now particularly described and ascertained the nature of my said invention

and in what manner the same is to be performed, I declare that what I claim is:—

1. A torpedo having propeller shafts arranged one about the other, and each provided with a propeller, the inner shaft having an exhaust passage extending there-through, and a spring-pressed valve normally closing the inner end of the exhaust passage, the propeller shafts having a limited sliding movement and provided with shoulders forming water-tight joints under the spring pressure of the valve, respectively located between each other and between the outer shaft and torpedo, the valve having a fluid-actuated piston arranged to withdraw it from the exhaust port, whereby said joints are free to be broken by the propeller thrust.

2. A torpedo having a propeller shaft provided with a propeller, a motor, a driving mechanism connecting the motor to the shaft, and an oil reservoir symmetrically disposed at each side of and below the propeller shaft and having a feed pipe leading to the said mechanism.

3. A torpedo having two motors with cylinders and connecting rods inclined below and lying in planes parallel to the axis of the torpedo.

4. A torpedo having two motors with inclined cylinders and connecting rods, a lubricating oil reservoir integral with the framework, arranged below the propulsion axis, a bottom for the reservoir to suit the contour of the torpedo and means for operating the propeller shafts.

5. A device of the character described, comprising a pair of tubular shafts concentric to each other and each provided with a propeller and mounted to move longitudinally in the direction of its axis of rotation, a bearing mounted upon the stern post of a torpedo for supporting the outer shaft, the inner shaft and the outer shaft being connected by a conical bearing which forms a water tight joint when said inner shaft is moved to its limit in one direction relatively to the outer shaft, a valve for closing the inner shaft, said valve being closed when the torpedo is stationary but free to open in order to permit the flow of a medium through said inner shaft while the torpedo is running.

6. A device of the character described, comprising a tubular shaft, a propeller mounted upon each shaft, a valve for normally closing said inner shaft, said valve

being movable in order to permit a fluid medium to pass through said inner shaft, and mechanism connected with said valve and controllable by air pressure for shifting said valve in order to open said inner shaft.

7. A torpedo having a body portion, and a propeller shaft revoluble relatively thereto, said shaft having generally a tubular form and provided with a joint normally water tight, said joint being controllable by the forward thrust of the propeller for the purpose of separating the parts normally forming the joint and thus avoiding injurious friction during running.

8. In a torpedo, the combination of a body portion, a plurality of propeller shafts revolubly mounted therein, said shafts having when at rest a water joint between them, said water joint being controllable by the forward thrust of said propeller shafts for the purpose of separating the parts normally forming the joint and thus avoiding injurious friction during running.

9. A torpedo comprising a body portion, and a pair of propeller shafts disposed one within the other and each provided with a propeller, said shafts being connected together by the joint which is normally water tight, outermost said shaft being connected with said body portion by a joint which is also normally water tight, both of said joints being controllable by the forward motion of the propellers for the purpose of separating the parts normally forming the joints and thus avoiding injurious friction during running.

10. A torpedo comprising a body portion, and a pair of shafts revolubly mounted upon said body portion, one of said shafts having a bearing upon the other, each of said shafts being provided with a propeller and with shoulders, and a spring for pressing said shafts in a direction to form water tight joints located respectively between said shafts and between the outer shaft and the body portion, said joints being controllable by the propeller thrust for the purpose of separating the parts normally forming the joints and thus avoiding injurious friction during running.

In testimony whereof I have hereunto placed my hand at Fiume, Hungary, this tenth day of August 1910.

ALBERT EDWARD JONES.

In the presence of two witnesses:

MACEO CLEMENTS,
AINGURDIN JÓZSEF.