Nov. 3, 1959 H. E. KARIG 2,910,953

JET DRIVEN TORPEDOES

Filed July 20, 1950

Fig.1.

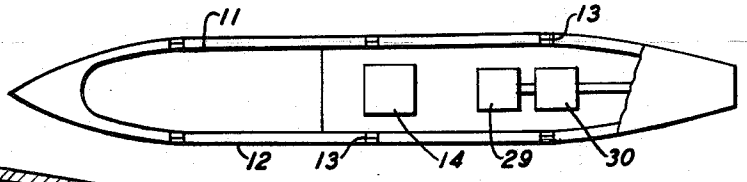


Fig.2.

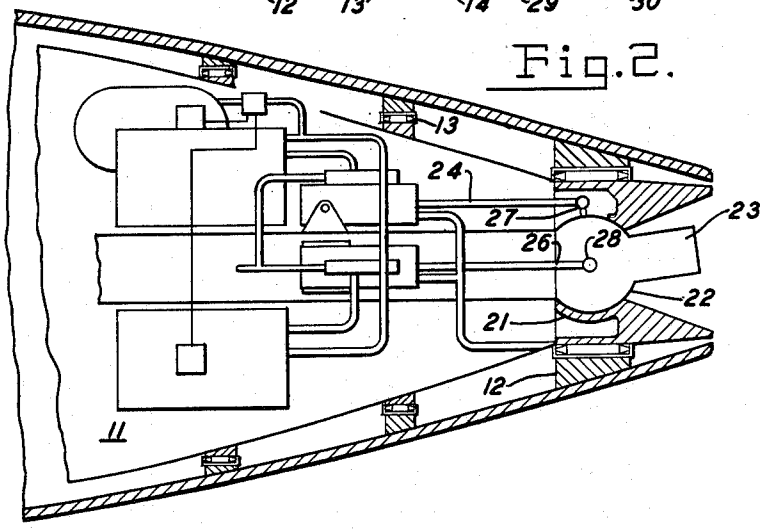
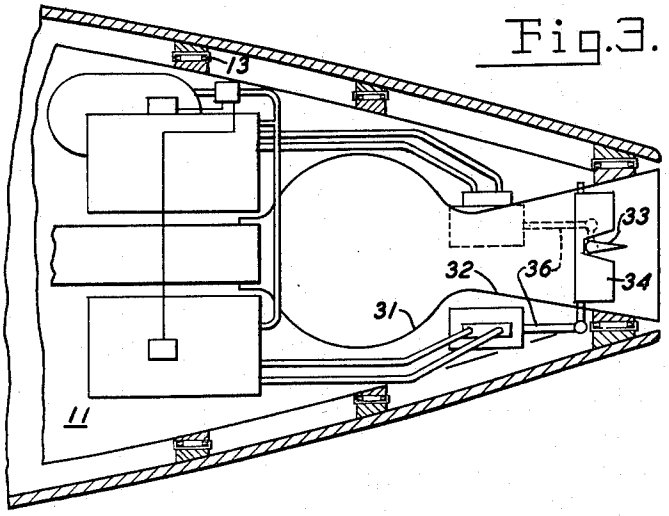


Fig.3.



INVENTOR.
HORACE E. KARIG
BY O. B. Hayden
Warren T. Jessup
ATTORNEYS

United States Patent Office

2,910,953

Patented Nov. 3, 1959

2,910,953

JET DRIVEN TORPEDOES

Horace E. Karig, Pasadena, Calif.

Application July 20, 1950, Serial No. 174,981

2 Claims. (Cl. 114—23)

(Granted under Title 35, U.S. Code (1952), sec. 266)

This invention relates to control and guiding apparatus for fluid borne vehicles and particularly to the guiding of a submersible, such as a torpedo.

It is an object of this invention to provide improved control means for a torpedo which may experience considerable rolling forces.

It is another object of this invention to provide control for a torpedo without requiring that the shell of the torpedo be prevented from rolling.

It is a further object of this invention to provide a torpedo, the shell of which will freely roll with application thereto of rolling forces such as rough water, but the control means of which will nonetheless be quite unaffected by the rolling of the torpedo.

In the past it has been necessary to compensate for the roll of a torpedo by injecting suitable stabilizing signals into the control means of the rudder. The instant invention precludes the necessity for stabilizing the shell of the torpedo, but allows the shell to roll freely while still stabilizing the interior carriage of the torpedo.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following description.

In accordance with the instant invention, there is provided a control carriage which is roll stabilized and substantially surrounded by an elongate casing or shell. The casing is rotatably mounted on the carriage for rolling around the axis of the casing. Rudder control means are mounted on the carriage for determining the direction of the torpedo. Guide means connected to and responsive to the control means are provided on the carriage so as to be effective outside the region of the casing to control the line of direction of the torpedo, irrespective of the rolling of the casing about the carriage.

Two specific embodiments of the instant invention will be described hereinafter to illustrate the principles thereof.

Referring to the drawings, Fig. 1 is a longitudinal sectional view of a torpedo constructed in accordance with the principles of the instant invention; and

Figs. 2 and 3 are detailed longitudinal sections illustrating alternative forms of the guiding means which may be employed at the stern of the torpedo.

In Fig. 1, 11 designates a torpedo carriage surrounded by an elongate casing or shell 12. Casing 12 is mounted over the carriage 11 by means of a series of roller bearings 13, which allow the casing 12 to freely roll about the carriage 11, on the axis of the casing.

The carriage 11 is stabilized in space by a stabilizing gyro 14, mounted thereto. It is a function of the gyro 14 to restrain the carriage 11 from rolling.

As the torpedo proceeds through the water, it is subjected to the buffeting of rolling forces which act on the exterior of the casing 12. The rotatable mounting of the casing 12 on the carriage 11 prevents these rolling forces from being transmitted to the carriage 11, the

casing being free to spin about its axis without affecting the stabilized carriage 11.

It is now necessary to transmit the driving force and also the guiding force from the carriage to the exterior of the torpedo without destroying the rolling relation between the carriage 11 and the casing 12. This may be done in a number of ways, one of which is exemplified in Fig. 2, wherein a universal joint 21 is shown supporting a hollow spherical housing 22 into which fluid under pressure is fed from a suitable source mounted to the carriage 11. From the periphery of the sphere 22 emerges a jet-forming nozzle 23 directed sternwardly of the torpedo through an opening in the casing 12. The driving fluid ejected from the jet nozzle 23 serves to impel the torpedo through the water.

By means of a pair of arms 24 and 26 connected by universal joints 27 and 28, respectively, to the housing 22, nozzle 23 may be swivelled in the universal joint 21, within a limited angle, so as to direct the jet rearwardly in any desired direction. In this way, the jet serves both to drive and to steer the torpedo.

The control arms 24 and 26 are controlled in response to signals from a control gyro 30 which is in turn controlled from any suitable source of signals 29 such as a preset control, or a radio or sonic sensitive control.

An alternative method of driving and controlling the torpedo is illustrated in Fig. 3, wherein 31 designates a reaction chamber for the jet motor terminating in a jet-forming nozzle 32, the whole assembly being fixedly secured to the carriage 11 and directed sternwardly, as in the case of Fig. 1.

In the Fig. 3 example, the rearward direction of the jet is controlled by a pair of vanes 33 and 34 disposed crosswise across the nozzle 32. The vanes are controlled by the arm and crank arrangement 36 illustrated, which, like the arms 24 and 26 of Fig. 2, is operated by a suitable control gyro.

In the embodiments shown, the stabilized carriage 11 carries all parts of the torpedo except the shell which rolls around the carriage. It will be readily understood that the line of demarcation between the rolling parts and the stabilized parts may be made at any point up to the control gyros. That is to say, the warhead and even the propulsive engine may be either stabilized as shown, or mounted to roll with the casing. In the event the propulsive engine is mounted to roll with the casing, a suitable slip joint conveys the motive fluid from the rolling engine to the stabilized carriage.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

1. A self-propelled torpedo comprising a carriage, gyroscopic means for preventing rolling motion of said carriage, a torpedo casing completely surrounding said carriage and rotatably mounted thereon for rolling thereabout, said casing being formed at the torpedo stern with an opening, a jet-forming nozzle movably connected to said carriage at the stern thereof and directed sternwardly through said opening, means within said carriage for supplying driving fluid to said nozzle and movable means mounted in said carriage and connecting with said nozzle to control the direction of the jet with respect to said carriage and thereby control the direction of the torpedo irrespective of the rolling of said casing around said carriage.

2. A self-propelled torpedo comprising a carriage, gyroscopic means for preventing rolling motion of said carriage, an elongate torpedo shell completely surrounding said carriage and rotatably mounted thereon for rolling about the axis of the shell, a source of fluid under pressure mounted within said carriage, jet-forming means movably connected to said carriage connected by fluid conduit to said source and directed sternwardly of the torpedo, and jet directing means mounted to react upon said jet forming means so as to control the jet direction with respect to said carriage and thereby guide the torpedo irrespective of the rolling of said shell about said carriage.

References Cited in the file of this patent

UNITED STATES PATENTS

502,168	Battey	July 25, 1893
1,028,644	Van Viersen	June 4, 1912
1,577,475	Liska	Mar. 23, 1926
1,838,354	Baver	Dec. 29, 1931
1,879,187	Goddard	Sept. 27, 1932
2,526,510	Smith	Oct. 17, 1950
2,537,487	Stone	Jan. 9, 1951
2,557,401	Agins et al.	June 19, 1951

FOREIGN PATENTS

18,228	Germany	May 19, 1882
657,557	France	Jan. 16, 1929