No. 732,920. PATENTED JULY 7, 1903.

F. T. CABLE.

SUBMARINE BOAT.

APPLICATION FILED NOV. 7, 1902.

NO MODEL.

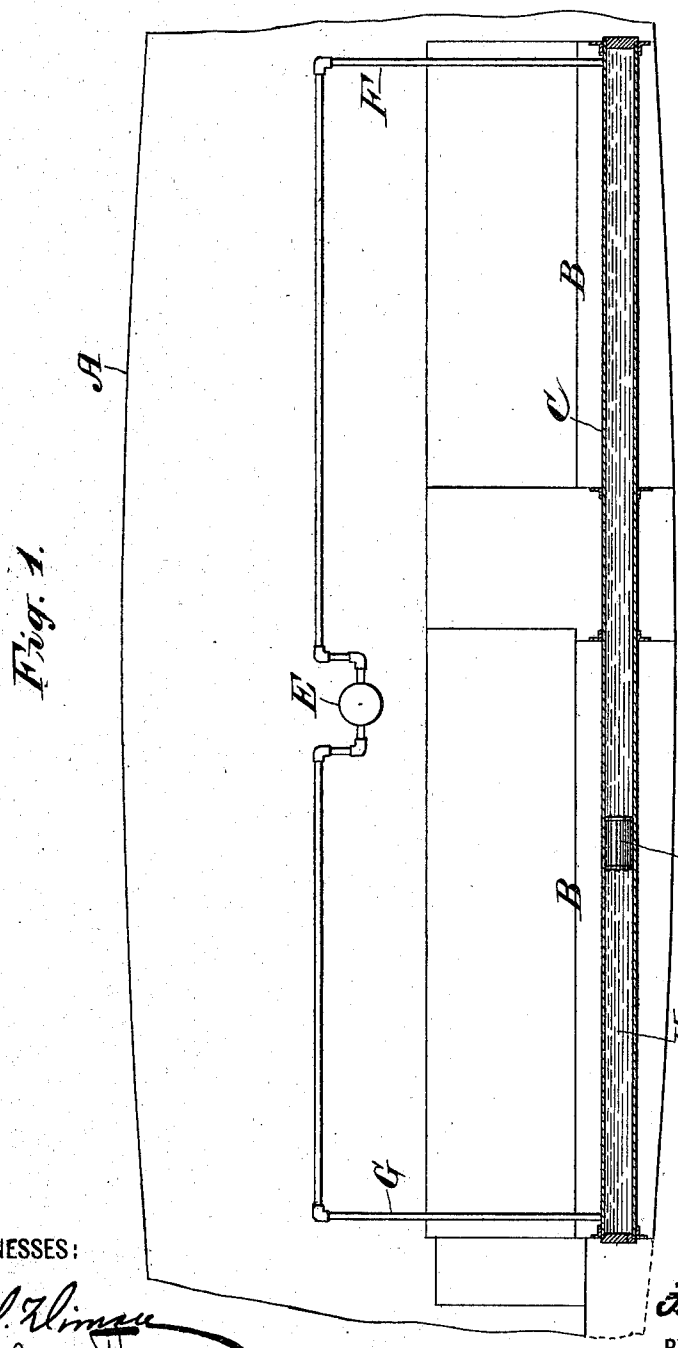


Fig. 1.

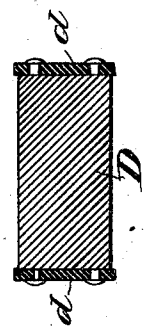


Fig. 2.

WITNESSES:

F. H. Klinge

H. C. Dominick

INVENTOR

Frank T. Cable

BY

Henry Cannon

ATTORNEY

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 732,920. Patented July 7, 1903.

UNITED STATES PATENT OFFICE.

FRANK T. CABLE, OF NEW SUFFOLK, NEW YORK, ASSIGNOR TO ELECTRIC BOAT COMPANY, A CORPORATION OF NEW JERSEY.

SUBMARINE BOAT.

SPECIFICATION forming part of Letters Patent No. 732,920, dated July 7, 1903.

Application filed November 7, 1902. Serial No. 130,368. (No model.)

To all whom it may concern:

Be it known that I, FRANK T. CABLE, a citizen of the United States, residing in New Suffolk, in the county of Suffolk and State of New York, have invented certain Improvements in Submarine Boats, of which the following is a specification.

This invention relates to the class of submarine boats or vessels, and has for its object to provide a simple and efficient means for controlling the trim of the boat.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a longitudinal vertical section of the middle portion of a submarine boat or vessel, illustrating the application of the invention thereto. The figure is somewhat diagrammatic, as the features of the boat, which have no relation to my invention and which are well known, have been omitted. Fig. 2 shows the piston-weight detached and in section.

A designates the hull of the boat, and B the ballast-tanks therein. Extending through the ballast-tanks fore and aft and in a vertical plane passing through the boat's axis is a tube or cylinder C, which is closed at its ends, and in this tube is a piston-weight D, having a snug sliding fit in the tube, so that liquids cannot leak past it.

E is a pump of any kind, herein represented diagrammatically, as any pump capable of pumping a liquid will serve. This pump is connected on its induction side with one end of the tube C by a pipe F and on its eduction side with the other end of the tube C by a pipe G. The tubes C, the pipes F and G, and the chamber of the pump are filled with some suitable liquid H, preferably oil.

When it is desired, in order to control or change the trim of the boat, to shift the piston-weight D along the tube C fore or aft, the pump E is set in motion, transferring the oil or liquid from one side of the piston-weight to the other. The effect of this is to shift the weight along the tube more or less, as may be desired, and thus alter the trim of the boat. When the pump is stopped, the weight is held in the position set, as the liquid cannot flow through the pump, and the body of liquid on the respective sides of the weight hold it fixedly in position.

Usually the tube C will extend fore and aft and the weight be employed to control the longitudinal trim; but the invention is not limited in this respect. The weight may be arranged for shifting transversely of the axis of the boat.

Any suitable fluid or liquid may be employed for moving or shifting the weight; but a non-compressible liquid, such as oil, is preferred. Of course there may be more than one of these devices in the boat for controlling the trim.

The piston-weight may be constructed in any suitable manner. In Fig. 2 it is shown as a heavy body with packing-disks *d* at its ends to prevent leakage of the liquid past it.

Having thus described my invention, I claim—

1. The combination with a boat, of a tube in the same containing a slidable piston-weight, a fluid in said tube and filling the same, and means for shifting said fluid from one side of said weight to the other proportionately for shifting the position of the weight along the tube, for the purpose specified.

2. As a means of controlling the trim of a boat, an elongated cylinder or tube in the boat, a piston-weight slidable in said tube, a fluid in and filling said tube, and a pump connected on its eduction side with one end of said tube and on its induction side with the other end of said tube, for shifting said fluid from one side of the said weight to the other and thus shifting the latter, substantially as set forth.

3. The combination with a submarine boat, of means for controlling the longitudinal trim of the same, said means comprising a tube extending lengthwise of the boat, a piston-weight slidably mounted in the same, a pump, pipes connecting the induction and eduction sides of the pump with the respective ends of said tube, and a liquid in and filling the said tube and pipes and the chamber of the pump, substantially as set forth.

In witness whereof I have hereunto signed my name this 1st day of November, 1902, in the presence of two subscribing witnesses.

FRANK T. CABLE.

Witnesses:

HOWARD G. TUTHILL,

FRANK L. BRAKE.