Jan. 15 , 1924. **1,480,836**

W. F. PURCELL

PROPELLING DEVICE

Filed March 1, 1920

Fig. 1.

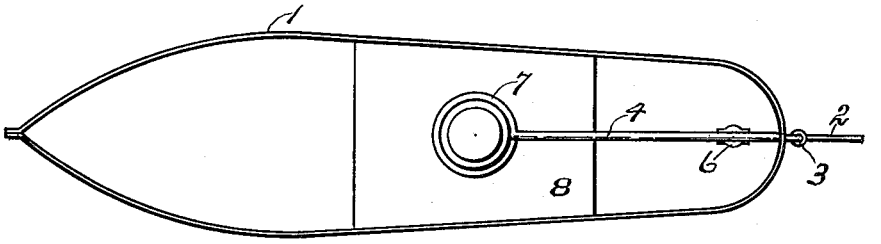
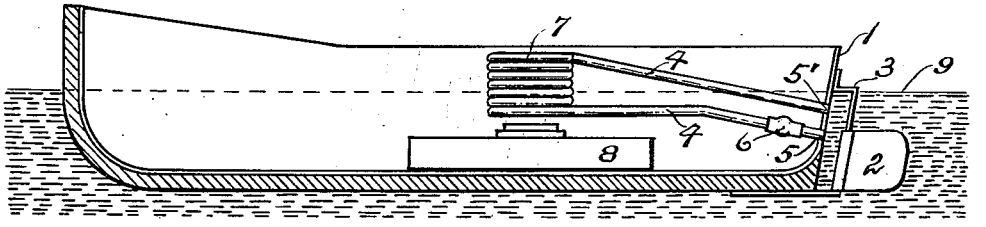


Fig. 2.



William F. Purcell INVENTOR

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UNITED STATES PATENT OFFICE.

WILLIAM F. PURCELL OF HOBOKEN, NEW JERSEY, ASSIGNOR TO HYDROMOTOR COMPANY, INC., A CORPORATION OF NEW YORK.

PROPELLING DEVICE.

Application filed March 1, 1920. Serial No. 362,209.

To all whom it may concern:

Be it known that I, WILLIAM F. PURCELL, a citizen of the United States, and a resident of the city of Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Propelling Devices, of which the following is a full, clear, and exact specification.

My invention relates to propelling devices, and refers particularly to devices for propelling boats.

One object of the invention is a propelling device occupying a minimum of space and having a minimum of weight.

Another object of the invention is a propelling device for steamboats, free from danger of explosion or burning out of the steam-generating element, and which requires no lubrication.

Another object of the invention is a propelling device for steamboats in which the steaming radius is limited only by the amount of fuel employed and is not dependent on the capacity of a water tank carried by the boat.

Another object of the invention is a propelling device, simple, durable and efficient, which can be applied to a very small toy boat where it would be impracticable to use motive mechanism such as is now commonly used.

The above and other objects of my invention will be evident upon a consideration of the drawings and specifications.

All of the above described objects are valuable properties of a propelling device in that they lead to cheapness, simplicity and effectiveness, and the incorporation of one or more of these elements in the device of my invention renders it a new, novel and useful means for the propelling of boats.

While my propelling device can be successfully incorporated and advantageously used in the propelling of vessels of considerable size, it has peculiar and particular value for use in toy boats on account of its simplicity, non-liability to get out of order, absence of danger of explosion, and small size.

In a broad way my device takes water from the water in which the vessel floats, converts it into steam and uses the steam as a direct impact means for propelling the vessel.

While numerous and varying combinations and arrangements of parts may be employed in the construction of my device, I have shown and described one such device, although not limiting myself to the particular construction shown and described.

In the accompanying drawings similar parts are designated by similar reference characters.

Figure 1 is a top plan view of a boat equipped with one form of my device.

Figure 2 is a vertical mid-section of Figure 1 showing the boat afloat.

The numeral 1 indicates the hull of a boat preferably formed of sheet metal and of conventional shape; 2 the rudder, which is pivotally mounted on the rudder-post 3 and is capable of being turned thereon to steer the boat, and 4 a tube, the open ends 5 5′ of which extend through the hull of the boat and are soldered or otherwise connected thereto in a water-tight manner. Adjacent to the end 5 is placed a check-valve 6, which is arranged to permit the entrance of water through the end 5 of the tube, but to prevent its discharge from said end. This valve is of a well-known type, and description of its construction is thought unnecessary. The tube is formed in a coil at 7 and an alcohol lamp or other means of generating heat 8 is located under the coil.

In small boats where a low steam pressure is used the valve 6 may be dispensed with, as the greater quantity of water in the end 5 of the tube acts as a check-valve.

The operation of the device is as follows:

By reference to Figure 2, it will be seen that when the boat is placed in the water, both ends of the tube are below the surface of the water, indicated by the numeral 9 while part of the tube within the boat is above the water-line. Therefore the water will enter and partially fill the tube, and upon heat being applied to the latter, steam will be generated which will forcibly eject the water from the end 5′ of the tube. This discharge will create a partial vacuum in the coil and water will enter through the end 5 which, when it enters the hot tube will be converted into steam and discharged through the end 5′ as before. This operation will continue as long as the boat is in the water and the lamp 8 continues to produce heat, the result being a rapid succession of pressure impacts against the water at the stern of the

boat, which will propel the latter through the water at high speed.

The simplicity, durability and effectiveness of my device will be evident upon a consideration of the above explanation of its construction and means of operation.

While I have shown and described in my particular example, a coiled pipe, or fluid container, partly above and partly below the water-line, I do not limit myself to this particular arrangement of parts.

I do not limit myself to a coiled pipe as the heater element, as any fluid container capable of employment with the other elements of my invention for the production of the desired results, may be employed; nor do I limit myself to the particular size, shape, number or arrangement of the parts shown and described, all of which may be varied without going beyond the scope of my invention as shown, described and claimed.

What I claim is:—

1. In combination with a boat, a continuous conduit, the extremities of which are in vertical alignment with each other and open into and below the surface of a liquid body upon which the boat is floated and means for heating a portion of the conduit whereby a succession of impacts of the conduit contents will be produced against the liquid body through one extremity of the conduit.

2. In combination with a boat, a continuous conduit, the extremities of which are in vertical alignment with each other and open into and below the surface of a liquid body upon which the boat is floated, an inwardly opening check valve within one extremity of the pipe and means for heating a portion of the conduit whereby a succession of impacts of the conduit contents will be produced against the liquid body.

3. In combination with a boat, a continuous conduit, the extremities of which are in vertical alignment with each other and open into and below the surface of a liquid body upon which the boat is floated and means for heating a portion of the conduit whereby the liquid will pass inwardly through one conduit extremity and outwardly in impulse movements through the other extremity.

4. In combination with a boat, a continuous conduit the extremities of which are in vertical alignment with each other and open into and below the surface of a liquid body upon which the boat is floated and means for heating a portion of the conduit within the boat producing a practically uniform succession of outwardly exerted impacts of the conduit contents against the liquid body.

5. In combination with a boat, a coiled conduit within the boat the extremities of which are in vertical alignment with each other and open into and below the surface of a liquid body upon which the boat is floated and means for heating the coiled portion producing a practically uniform reciprocating movement to the liquid contents of the conduit.

Signed at New York, in the county of New York, and State of New York, this 27th day of February, 1920.

WILLIAM F. PURCELL.