C. J. McHUGH.

POWER PROPELLED BOAT.

APPLICATION FILED FEB. 8, 1915.

1,200,960. Patented Oct. 10, 1916.

Fig. 1.

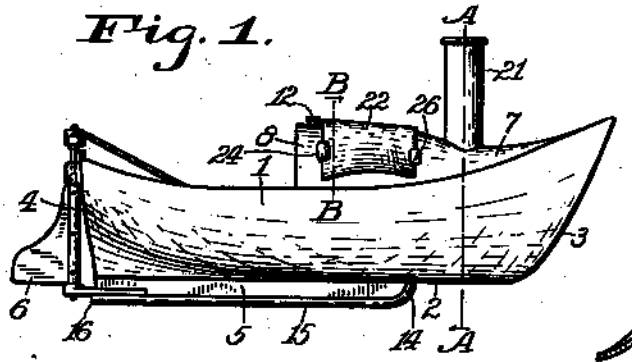


Fig. 2.

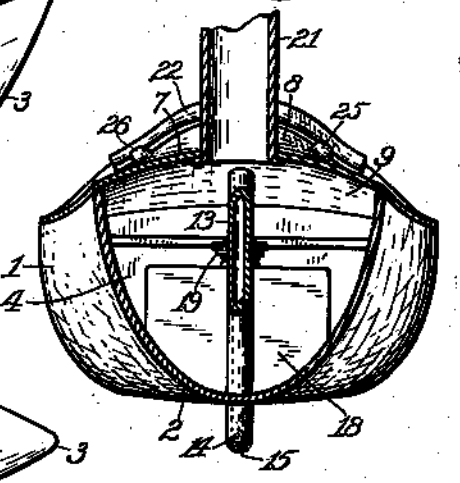


Fig. 3.

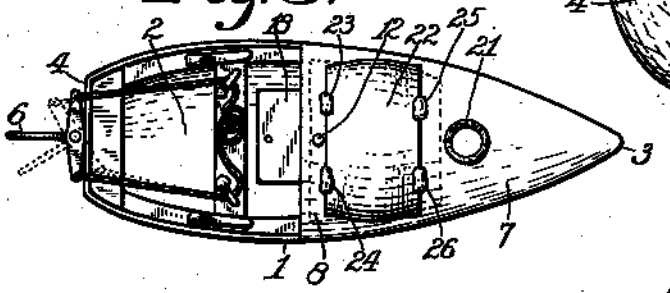


Fig. 4.

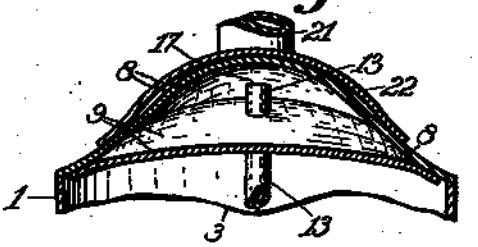
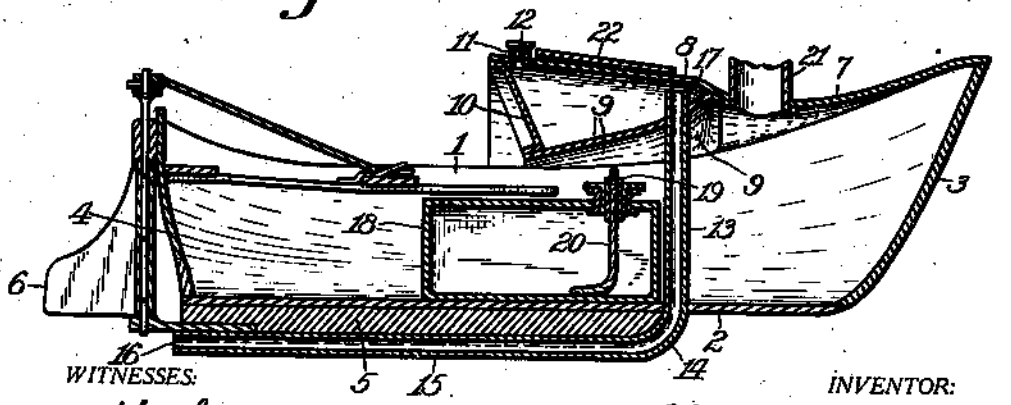


Fig. 5.



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UNITED STATES PATENT OFFICE.

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POWER-PROPELLED BOAT.

1,200,960. Specification of Letters Patent. Patented Oct. 10, 1916.

Application filed February 8, 1915. Serial No. 6,747.

To all whom it may concern:

Be it known that I, CHARLES J. McHUGH, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Power-Propelled Boat, of which the following is a specification, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon.

This invention relates to means for propelling boats, or for generating power for various purposes where water is available to contribute to the motive force, the invention having reference more particularly to a propulsion system for water-craft of various types and more especially for toy boats.

An object of the invention is to provide power-propelling apparatus that shall be so constructed as to obviate the necessity of providing engine machinery or mechanism having movable parts entailing initial cost, repairs, and frictional resistance, and which shall be suitable more especially for propelling boats or other water-craft.

A further object is to provide an improved apparatus for the propulsion of toy boats in water and of such construction as to permit of manufacture at small cost and be efficient, safe, and economical in operation.

With the above-mentioned and other objects in view, the invention consists in a conduit having one open end to be immersed in water and another open end inclosed in a steam boiler whereby the water is alternatively drawn into the conduit and forcibly expelled therefrom to produce power; and the invention consists also further in the novel parts, and combinations and arrangements of parts, as hereinafter particularly described and set forth in the accompanying claims.

Referring to the drawings,—Figure 1 is a side elevation of a boat provided with the improved propelling system; Fig. 2 is a section on the plane of the line A A on Fig. 1; Fig. 3 is a top plan of the boat; Fig. 4 is a fragmentary section on the plane of the line B B on Fig. 1; and, Fig. 5 is a longitudinal vertical section centrally of the boat and the propelling apparatus thereof.

Similar reference characters on the different figures of the drawings indicate like parts or features of construction herein referred to and described.

As illustrating the construction, application, and the mode of operation of the invention, it is shown as applied to a simple form of boat comprising a main hull portion 1, a bottom 2, a bow 3, and stern 4, and preferably a keel 5. The boat is provided at its stern with a suitable rudder 6.

For the purpose of the invention, especially when constructed as a toy, the forward portion of the hull is provided with a deck 7 which may be composed of suitable sheet metal. A boiler is provided and comprises a top sheet which may be conveniently formed of a continuation of the deck and suitably arched so as to constitute a boiler top 8 to which a metallic bottom 9 is secured, the bottom preferably being arched and inclined so that the rear end is lower than the forward end of the bottom and spaced apart from the top, the forward end of the bottom being secured directly to the boiler top, and a rear end 10 is secured to the top and also to the boiler bottom adjacent to the rear ends thereof. The boiler top is provided with a filling neck 11 provided with a closure 12.

A conduit is provided and arranged in a novel manner, being preferably composed of a single piece of pipe, especially for toy boats, and comprises an approximately vertical portion 13 that is inserted through and secured to the bottom 2 of the boat and is also inserted through and secured to the bottom 9 of the boiler. The pipe has a bent portion or elbow 14 below the boat bottom and an approximately horizontal portion 15 extending from the bent or elbow portion rearward under the boat bottom, preferably as far back as the stern of the boat and preferably beneath the keel, if a keel is provided. The conduit or pipe has an open rear or lower end 16 arranged for expelling

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water rearward into the water in which the boat floats for propelling the boat forward. The conduit or pipe has an open upper end 17 near the top 8 of the boiler with sufficient space to permit free flow of water from the conduit into the boiler.

Suitable means are provided for heating water in the boiler, and in a toy boat suitably comprise a reservoir or font 18 for holding alcohol and provided with a burner 19 having a feed-wick 20, so that a safe and economical source of heat is made available, the reservoir being placed in the hull of the boat so that the burner shall be under the bottom of the boiler. Preferably a smoke-stack 21 is inserted in and secured to the deck 7 forward of the boiler to carry off the fumes of combustion, and particularly in a toy to give a realistic impression of a steam boat.

In some cases, if the boiler top is quite thin, a sound producer is provided for creating an interesting illusion and comprises a thin sheet of metal suitably curved to constitute a diaphragm 22 which is arranged upon the boiler top 8 and secured at its forward and rearward edges to the top by means of securing devices 23, 24, 25, 26, which may be composed of solder.

In practical use the boiler is filled with water and a flame is produced under the boiler which heats the water and produces steam that passes into the upper end of the portion 13 of the pipe. The steam on coming into contact with the cold water in which the boat is floating rapidly condenses, thus causing a vacuum in the conduit with the result that water is drawn in through the pipe and meets the hot water in the boiler in which reaction occurs, so that while the partial vacuum exists the heated water expands and drives out the water from the pipe followed by hot vapor or steam which condenses when coming into contact with the water as before. This complete cycle is repeated indefinitely until the heat becomes exhausted. The water is drawn from all angles into the end 16 of the conduit and does not affect the movement of the boat but the charge of water is forced out in a solid stream with great force into the surrounding water, which forces the boat forward.

When the boiler is made of thin sheet metal the pulsations in operation cause the boiler to vibrate, as a diaphragm, producing sounds similar to the exhausting of steam from an engine which is accentuated by the diaphragm or sound producer 22 on the top of the boiler.

Having thus described the invention, what is claimed as new is—

1. A boat provided with a steam-boiler composed of thin vibratable sheet metal, and a pipe extending from the upper portion of the interior of the boiler downward through the bottom of the boiler and the bottom of the boat and thence toward the stern of the boat, the pipe having open ends.

2. Propelling means including a boiler constructed of thin vibratable sheet metal for steam generation and alternating expulsion and suction of water and having a conduit extending from the upper portion of the interior thereof downward and away from the boiler and thence along an approximately horizontal plane.

3. A boat having a pipe extending under the bottom thereof and upward into the boat and having open ends, the pipe having a terminal in proximity to the stern of the boat, a boiler in the boat constructed of thin vibratable sheet metal and receiving the upper end of the pipe, and means in the boat under the boiler for directing a flame to the bottom of the boiler.

4. A boat having propelling means including a conduit for receiving and expelling water, and a boiler connected with the conduit to receive the water constructed of thin vibratable sheet metal and provided with a heater for converting the water into vapor in the boiler to induce action and reaction of the water in the conduit and vibration of the sheet metal boiler structure.

5. Propelling apparatus including a vibratory boiler provided with a heater, and a conduit extending through and connected to the lower portion of the wall of the boiler and having open ends, the conduit extending downward from the boiler and being curved and extending thence along an approximately horizontal plane, the uppermost end of the conduit terminating in the upper portion of the boiler to discharge water into the boiler and to receive steam.

6. A boat comprising a hull, a boiler on the upper portion of the hull, a pipe having open ends and extending from the upper portion of the interior of the boiler downward through and being secured to the bottom of the boiler, the pipe extending also through and being secured to the bottom of the hull and extending thence under the hull approximately to the stern of the hull, a lamp in the hull below the boiler, and a sounding plate connected to the upper side of the top of the boiler.

7. A toy boat comprising a hull, a keel on the under side of the hull, a boiler on the upper forward portion of the hull and having an inclined bottom, a deck on the hull forward of the boiler, a smoke stack forward of the boiler connected to and supported by the deck, the stack being open below the deck, a pipe having open ends and extending from the upper portion of the interior of the boiler downward through and being secured to the higher portion of the

bottom of the boiler, the pipe extending also through and being secured to the bottom of the hull and extending thence under the keel and approximately to the stern of the hull, and a lamp in the hull below the lower portion of the bottom of the boiler.

In testimony whereof, I affix my signature in presence of two witnesses.

CHARLES J. McHUGH.

Witnesses:

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M. E. SPARROW.