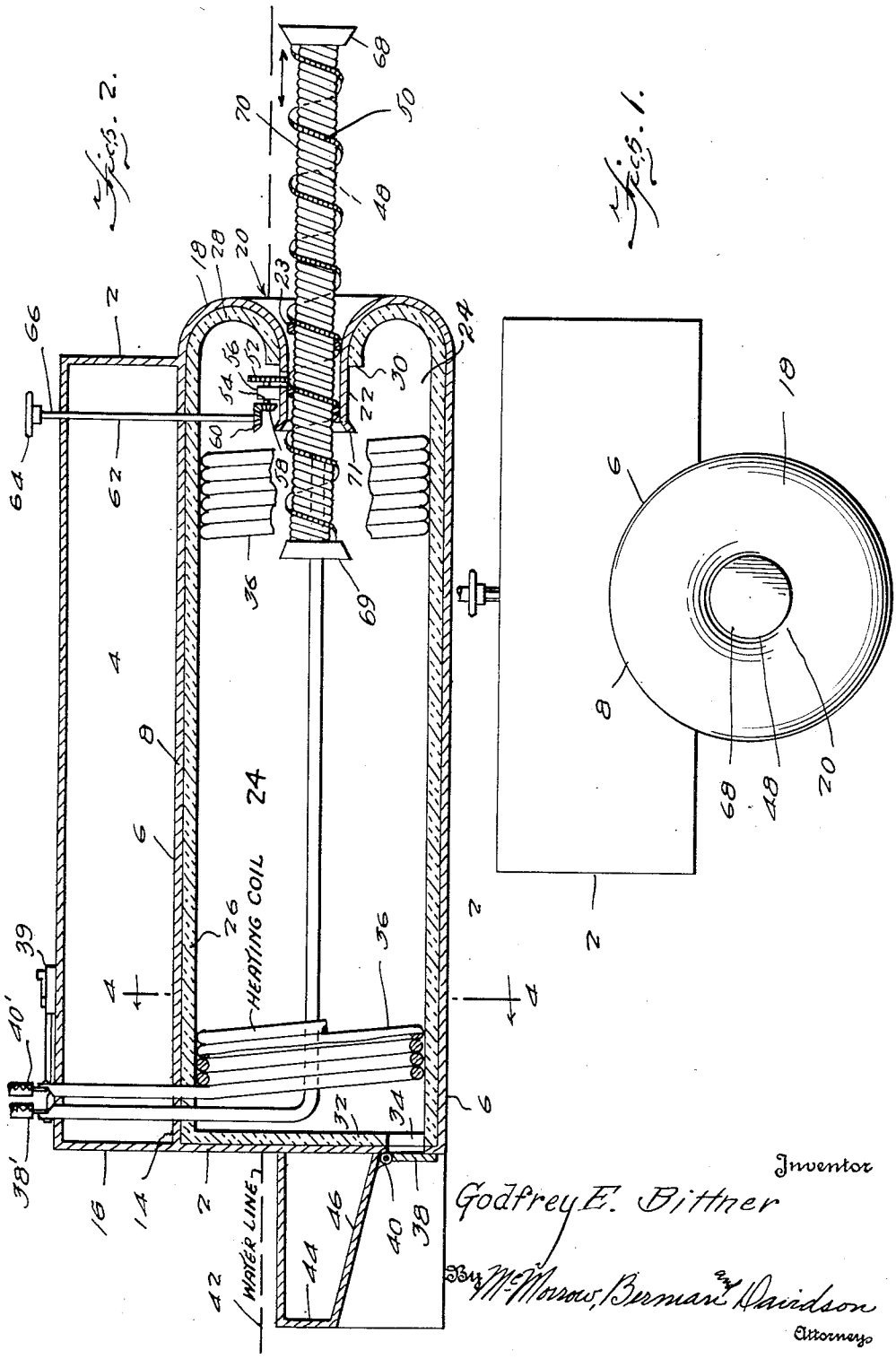
March 27, 1951 G. E. BITTNER 2,546,210

JET PROPELLED VESSEL HAVING SUBMERGED CAPILLARY FEEDING MEANS FOR THE STEAM BOILERS

Filed Nov. 22, 1946 2 Sheets-Sheet 1



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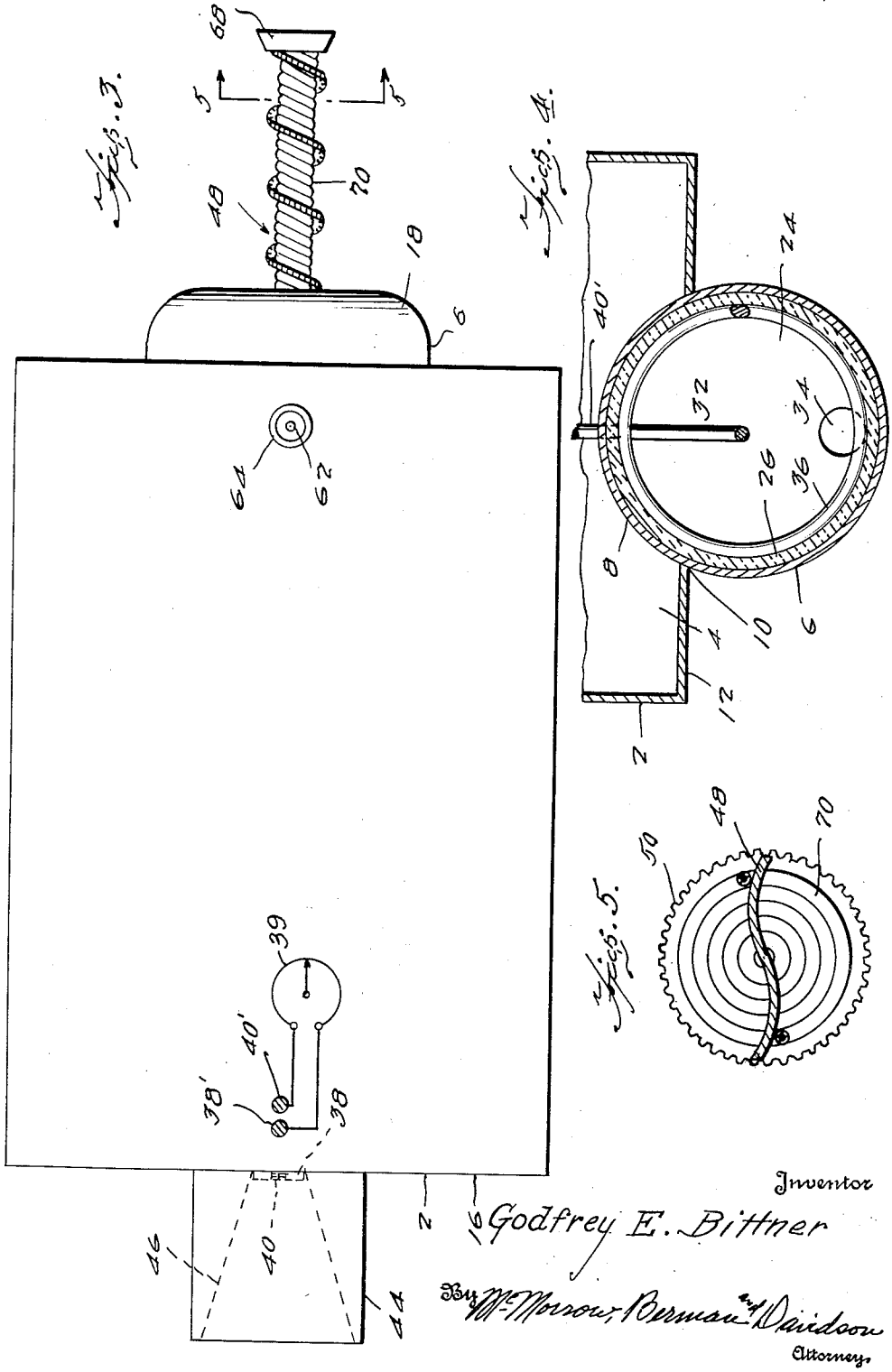

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JET PROPELLED VESSEL HAVING SUBMERGED CAPILLARY FEEDING MEANS FOR THE STEAM BOILER

Godfrey E. Bittner, Seneca, Oreg.

Application November 22, 1946, Serial No. 711,642

3 Claims. (Cl. 60—35.5)

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This invention relates to marine propulsion devices.

An object of this invention is to provide a steam generator for driving a vessel by the discharge of steam under high pressure from the vessel.

Another object of the invention is to provide a propulsion device including a steam generator, and means for discharging steam under high pressure from said steam generator whereby the vessel may be propelled by direct rocket reaction of the steam acting upon the vessel in a well known manner.

A further object of the invention is to provide a propulsion device for a vessel including a steam generator in which steam is created by injecting water onto an electrically heated element which lines a cylinder tube, and allowing the steam thus created to escape through an exhaust valve to create a reactive thrust against the cylinder tube and thus to propel the vessel.

Still another object of the invention is to provide a marine propulsion device which is simple in design, inexpensive to manufacture, and which is effective for the purpose intended.

Other objects and advantages of the invention will become apparent from the following description of a preferred embodiment thereof as illustrated in the accompanying drawings, and in which,

Figure 1 is a right end elevation of the device as seen from the right of Figure 2,

Figure 2 is a sectional side elevation of the device shown in Figure 1,

Figure 3 is a plan view of the device shown in Figure 2,

Figure 4 is a sectional view taken on line 4—4 of Figure 2, and

Figure 5 is a sectional view taken on line 5—5 of Figure 3.

Steam is a tremendous force and can be used at high pressure under water in propelling boats. My invention would reclaim the energy that now is lost by the use of the rigid propeller blade. As boats are now propelled, the energy that is generated by the boat engine loses half its power before reaching the propeller. On the other hand, my invention relates to a device which gives substantially its entire energy to the task of propelling the boat, with no long heavy drive shafts to rob its power, nor any backward drag due to frictional or water displacement, as is the case with any solid propeller attached to a hull.

Reference may now be had to the drawings, in which like reference characters denote similar parts throughout the several views. As shown, there is an upper housing 2 which is somewhat box like in shape, and forms an upper chamber 4 therein. A cylindrical outer casing 6 has an upper curved portion 8 thereof extending into the upper chamber 4 through an opening or cut out portion 10 in the lower wall 12 thereof.

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The left hand end 14 of the cylindrical outer casing 6 extends into contact with the inner surface of the left end wall 16 of the upper housing and is secured thereto in any suitable manner. The right hand end 18 of the outer casing 6 is curved as shown best in Figures 2 and 3, with its inner or central portion 20 curved back upon itself and drawn inwardly to form an axial tube 22 extending into the chamber 24 inside the cylinder 6.

A cylindrical inner casing 26 forms the lining of the cylinder 6, with its right hand end portion 28 curved back upon itself like the curvature of the outer casing at location 20 in order to form a lining thereof, as best shown in Figure 2, the bent back portion terminating at location 30. An inner casing end wall 32 closes the left hand end of the inner casing 26, as seen in Figure 2, a rounded aperture 34 being formed in the lower portion of the wall 32 to permit escape of steam therethrough toward the left.

The chamber 24 is lined with a coiled heating element 36 which is supplied with energy by means of the electrical leads 38' and 40' which extend upwards through the upper housing 2 and are connectable to a source of electrical energy, the leads 38' and 40' being connected to a rheostat 39. Steam is created by injecting water onto the electrical heating element 36 inside the steam generating chamber 24. Water enters through the water intake tube 22, and, in striking the heating element 36, the water is converted into steam almost instantaneously, raising the pressure within the chamber 24. A gate valve 38 is hinged at 40 over the opening 34 extending through the walls 32 and 16, so as so to be swingable under the influence of the steam pressure in the chamber 24 in a clockwise direction about the pivot 40, opening the exhaust valve 38 and allowing the steam to escape to the left as seen in Figure 2 to be discharged directly into the water below the water line 42. Such discharge exerts a reactive thrust on the right-hand end of chamber 24 which is effective to propel the boat to which the device is attached in a well known manner.

The discharge of the steam is guided by means of the casing extension 44 which has walls 46 which diverge as they extend away from the opening 34, as shown in Figures 2 and 3, forming a half shell. This half-shell is instrumental in straightening out the lines of secondary reactive force parallel to the ship's hull by providing balanced thrust surfaces. This is to prevent temporarily the force from following the lines of least resistance, which in this case would be towards the surface of the water.

For regulating the admittance of water into

the cylinder 24, through the entrance tube 22 in the cylinder head, I provide an auger 48 having teeth 50 formed along its outer spiral edge, as shown best in Figure 5. The inner periphery of the tube 22 is formed with a spirally disposed trackway providing means 23 complementary to the pitch of the auger and in which the latter is threaded. The auger is extensible into and out of the entrance tube 22 under the influence of the gear wheel 52, the teeth of which mesh with the teeth 50 on the auger to cause it to be moved into and through the entrance tube 22 to the right or left, as seen in Figure 2, as the gear wheel 52 turns on its horizontal axis shaft 54.

The gear wheel extends partly through an opening formed in the side of the entrance tube 22, as shown in Figure 2, and has its shaft carried in bearings 56 secured to the outer surface of the tube 22 within the cylinder 24. A bevel gear 58 on the shaft 54 meshes with a similar bevel gear 60 carried on the lower end of a valve adjusting shaft 62 extending upwards through the inner and outer casing walls and through the upper housing 2, as shown in Figure 2. A handle wheel 64 is secured to the upper end 66 of the shaft 62 to permit turning thereof by an operator to cause the auger valve 48 to be moved inward and outward in the water entrance tube 22.

The auger 48 has a closure cap or valve plug 68 secured to its outer end, which, when the auger is fully extending into the cylinder 24, tightly closes the tube 22, thus preventing further water from entering. The auger valleys 70 are completely wrapped with insulated wiring, asbestos insulated, with only the flanged toothed track of the auger exposed.

As best seen in Figure 2, the inner end of the auger is also provided with a cap 69 which seats against the flared inner end 71 of the entrance tube 22 when the auger is extended out of the cylinder to the right, thus sealing the cylinder. This permits it to be heated prior to operating by blocking entry of water or moisture into the cylinder prior to the time desired.

Water is supplied constantly to the interior of chamber 24 by the capillary attraction of the asbestos insulation aforesaid which serves as a wick. Thus, that portion of auger 48 that is within chamber 24 constantly draws in water from that portion which is outside of such chamber whereby to constantly replenish that water which has evaporated and been discharged as steam through the gate valve 38.

Control is exercised by means of an electrical rheostat or other control, and by the handle wheel 64. If desired, induction heating may be employed.

Although I have described a preferred embodiment of my invention in specific terms, it is to be understood that various changes may be made in size, shape, materials and arrangement without departing from the spirit and scope of the invention as claimed.

I claim:

1. A marine propulsion device for a vessel, said device comprising a casing having a cylindrical chamber formed therein, said chamber being adapted to be partially submerged in a body of water, capillary means for admitting water into said chamber from one end thereof, means for generating steam in said chamber from said admitted water, means for discharging a jet of steam from an opposite end of said chamber and below the water line, whereby to propel said vessel by the reaction of said jet, and means exteriorly of said chamber and partially surrounding said jet for guiding the same for most efficient transfer of energy.

2. A marine propulsion device for a vessel, said device comprising a casing having a cylindrical chamber formed therein, said chamber being adapted to be partially submerged in a body of water, capillary means for admitting water into said chamber from one end thereof and axially of said chamber, a helical heating element carried by said chamber and concentrically disposed about said capillary means for generating steam from water admitted to said chamber by said capillary means, means for discharging a jet of said steam from an opposite end of said chamber and below the water line whereby to propel said vessel by the reaction of said jet, and means for varying the volume of water admitted to said chamber by said capillary means.

3. A marine propulsion device for a vessel, said device comprising a casing having a cylindrical chamber formed therein, said chamber being adapted to be partially submerged in a body of water, said chamber including one end formed to provide a tubular passage axially of said chamber and below the water line, an auger mounted in said tubular member axially thereof, a valve plug carried by each of the ends of said auger, said auger normally extending exteriorly and interiorly of said chamber, the valleys of said auger being wrapped with fibrous material having capillarity whereby to provide means for supplying water to the interior of said chamber, said auger being formed with a spiral series of peripheral teeth, gear means carried by said chamber and engaging said teeth to cause rotation of said auger and move said valve plug axially of said tubular member whereby to vary the volume of water admitted to said chamber, a coiled heating element concentrically disposed about said auger inwardly of said chamber, said chamber including an end wall opposite to said first-named end wall and formed to provide a discharge opening therein below the water line, a normally closed flap valve hinged over the outer end of said discharge opening, said flap valve being adapted to be opened by steam pressure whereby to discharge a jet of steam from said chamber and propel said vessel by the reaction of said jet.

GODFREY E. BITTNER.

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