Feb. 27, 1951 D. W. HUMPHREY 2,543,024

JET EJECTION PROPULSION

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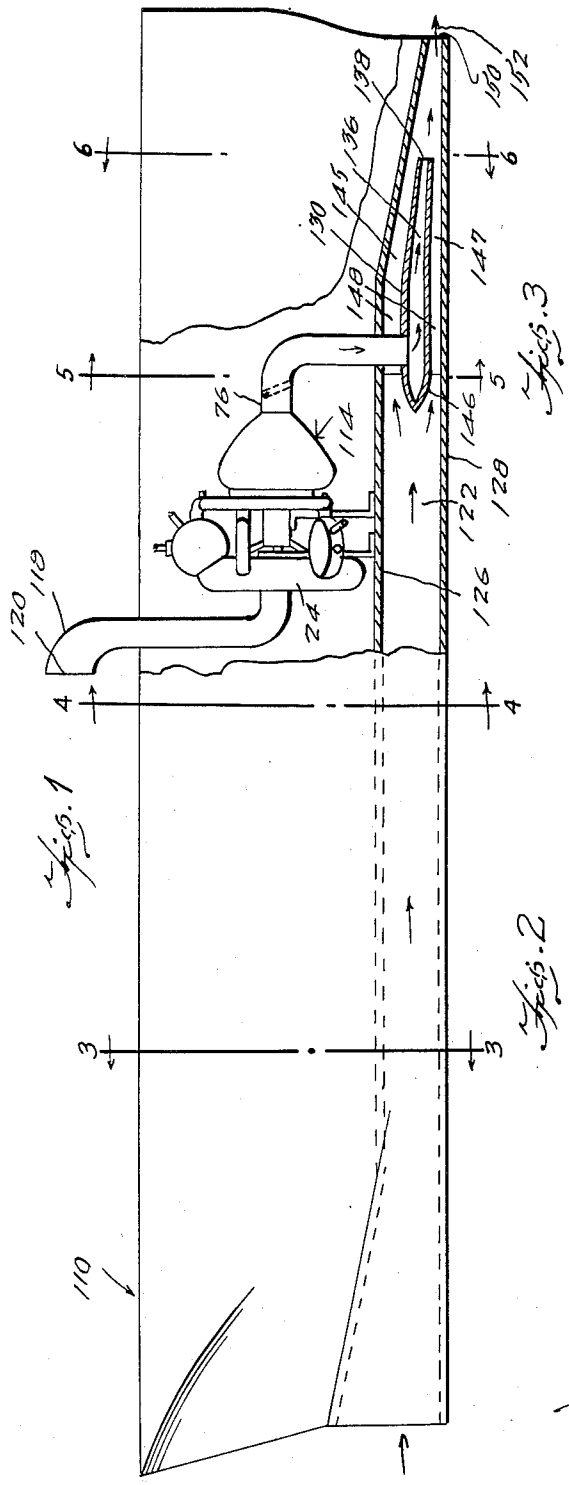


Fig. 1

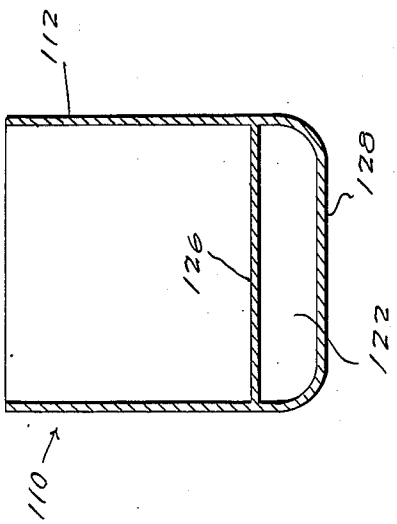


Fig. 3

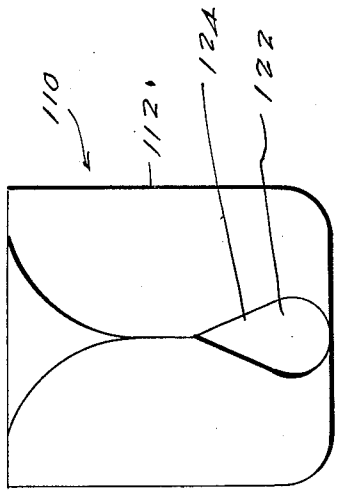


Fig. 2

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Fig. 4

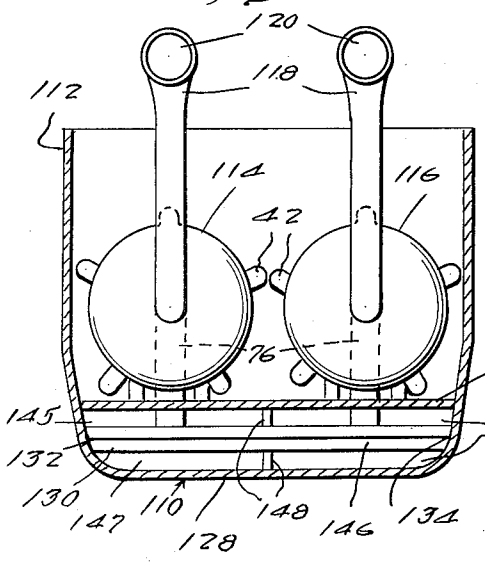


Fig. 6

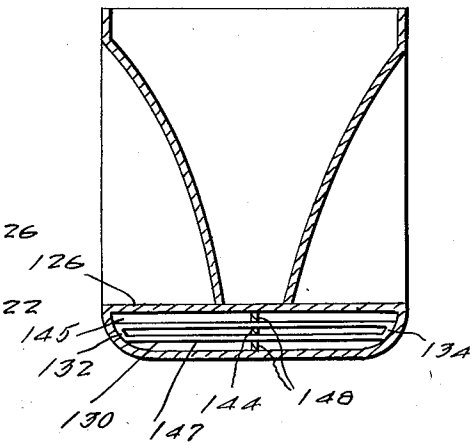


Fig. 5

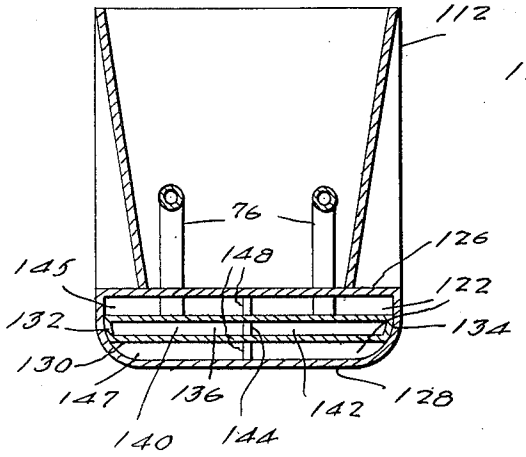
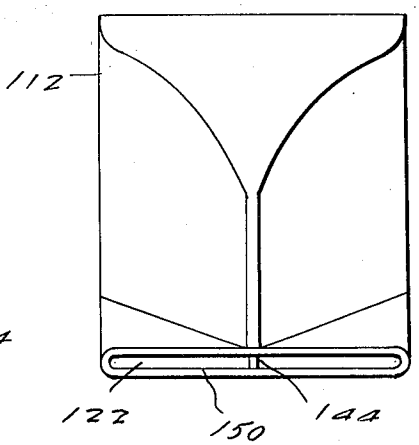


Fig. 7



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JET EJECTION PROPULSION

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Application June 28, 1946, Serial No. 680,175

3 Claims. (Cl. 115—14)

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This invention relates to the propulsion of vessels and aircraft and to engines therefor.

An object of this invention is to provide a jet ejection propulsion engine for generating high velocity gases whereby a vessel or an aircraft may be propelled.

Another object of the invention is to provide a jet propulsion device which may be applied to vessels and having means for propelling the vessel as a result of the reaction of high energy high velocity gases upon water into which said gases are discharged.

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 partly broken out side elevation of a vessel with a pair of engines according to the invention, installed in its hull.

Figure 2 is a left end elevation of the vessel shown in Figure 1.

Figure 3 is a sectional elevation taken on line 3—3 of Figure 1.

Figure 4 is a sectional elevation taken on line 4—4 of Figure 1.

Figure 5 is a sectional elevation taken on line 5—5 of Figure 1.

Figure 6 is a sectional elevation taken on line 6—6 of Figure 1, and

Figure 7 is a right end elevation of the vessel shown in Figure 1.

As described, the unit includes two main parts, namely the gas turbine for generating high velocity gases, and the ejection unit which causes the gases to make the greatest possible reaction when nozzled into the water or into the air in the case of aircraft.

An important feature of the invention is the injection of water into the combustion chamber at such a rate as to keep the temperature of the gases at a safe limit, below the critical temperature of the metal in the turbine blades.

Reference is now had to the drawings, in which like numerals designate similar parts throughout the several views.

Figures 1 through 7 show the construction of a vessel 110 inside the hull 112 of which two engines 114 and 116 are installed, each engine having its air intake tube 118 with an open mouth at 120. Each engine also has its exhaust pipe 76 extending downward through the hull into the water passageway 122 which extends longitudinally the entire length of the vessel as best shown in Figure 1. As shown in Figure 2, there is a large pear-shaped opening 124 in the bow of the

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vessel for the entrance of water into the passageway 122.

The water passageway 122 running the entire length of the ship eliminates the need for double bottom tanks, because the water tight bottom 126 would be protected by the frames and bottom 128. The water passageway 122 is divided horizontally as shown in Figures 1, 4, 5 and 6, by the ejection unit housing 130 which extends laterally the full width of the water passageway, with its sides 132 and 134 in contact with the abutting inner surfaces of the hull as shown.

The ejection unit housing 130 has an inner chamber 136 which is open at its rearward constricted gas discharge end 138, and is divided longitudinally into two chambers 140 and 142 by a longitudinal vertical wall 144, so that the discharge tube 76 of the left engine as shown in Figures 4 and 5 leads into chamber 140, while the discharge tube of the right engine leads into chamber 142. The housing 130 is streamlined as at 146, and the water flows above and below the horizontally disposed housing 130 through paths 145 and 147 toward the rearward portion of the water passageway, the wall 148 dividing the said paths into left and right portions longitudinally.

Gases discharged from the engines 114 and 116 flow downward through their respective discharge pipes 76, into their respective chambers 140 and 142, and out in divided streams through the rearward constricted jet nozzle openings at 138, where they are mixed with the water in the water passageway, imparting thereto their energy and causing the water to move through the rearward opening 150 at high velocity so as to exert a considerable rearward thrust in the direction of the arrow 152 in Figure 1, whereby the vessel is propelled.

For steering purposes, it is only necessary to operate the ship in the same manner as twin screw ships, by either turning off one engine while operating the other, or by operating the engines at different rates. For astern motion, a small ejection unit may be installed in the bow. The opening 124 in the bow has the advantages of reducing the size of bow waves, and of reducing the surface friction of the bow. There is no danger of fouling propellers since they are not used, and double bottom tanks are not necessary. The machinery is simple and therefore trouble free. One turbine can be used to drive the ship through the use of crossovers in the gas passages. No rudder troubles exist because the steering is done by the amount of power applied on either port or starboard unit.

Although I have described preferred embodi-

ments 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. Jet ejection propulsion means for a waterborne vessel comprising means providing an elongated passageway below a bottom wall of said vessel, said passageway having an open forward end and an open, restricted rear end, a gas discharge tube extending downwardly into said passageway, and a hollow body within said passageway spaced from the walls thereof and communicating internally with said gas discharge tube, said body having an open, restricted rear end directed toward the open, restricted rear end of said passageway, and said means providing said passageway comprising an inner and an outer bottom wall of said vessel.

2. Jet ejection propulsion means for a waterborne vessel comprising means providing a pair of elongated, side-by-side passageways below a bottom wall of said vessel, said means comprising an inner and an outer bottom wall of said vessel, a hollow body in said passageways near the rear ends thereof extending laterally thereacross and having an open, restricted rear end directed toward the rear ends of said passageways, a partition in said body dividing the interior thereof into two jet discharge chambers one for each passageway, and a pair of gas discharge tubes extending downwardly one into each chamber, the upper and lower walls of said hollow body being spaced from the inner and outer bottom walls of said vessel to provide water passages past said body above and below the same.

3. Jet ejection propulsion means for a waterborne vessel comprising means providing a pair of elongated, side-by-side passageways below a bottom wall of said vessel, said means comprising an inner and an outer bottom wall of said vessel, a hollow body in said passageways near the rear ends thereof extending laterally thereacross and having an open, restricted rear end directed toward the rear ends of said passageways, a partition in said body dividing the interior thereof into two jet discharge chambers one for each passageway, and a pair of gas discharge tubes extending downwardly one into each chamber, the upper and lower walls of said hollow body being spaced from the inner and outer bottom walls of said vessel to provide water passages past said body above and below the same, said passageways together extending longitudinally and laterally the length and breadth of the bottom of said vessel.

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