

UNITED STATES PATENT OFFICE.

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APPARATUS FOR STEERING VESSELS.

SPECIFICATION forming part of Letters Patent No. 347,983, dated August 24, 1886.

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To all whom it may concern:

Be it known that I, BENJAMIN T. BABBITT, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Apparatus for Steering Vessels, of which the following is a specification.

My invention relates to apparatus employed in steering a vessel, which consists, essentially, of a pipe extending into a lateral passage arranged transversely across the hull of a vessel and open at both ends, the said pipe being provided with a laterally presented orifice, through which a jet of fluid under pressure may issue into the passage in a direction toward one or other of the ends thereof, the said pipe being rotatable or capable of being turned, so as to present the discharge or jet orifice toward either of the ends of the passage. Fluid, whether it be compressed air, steam, or gas issuing from the outlet orifice or jet in the supply-pipe, will, when it is presented toward one end of the passage, expel the water therefrom in one direction, and produce a suction in the opposite direction, thereby tending to turn the vessel in a direction opposite to that in which the jet of fluid issues from said pipe.

The object of my invention is to make apparatus of this class for steering more effective than heretofore; and the invention consists in novel features in the construction and arrangement of the lateral passage in the vessel and the fluid-supply pipe, as hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of a vessel embodying my invention, and Fig. 2 is a plan and horizontal section through the water-passages in the hull of the vessel.

Similar letters of reference designate corresponding parts in both figures.

The vessel which I have here chosen to illustrate my invention is intended to be propelled by hydraulic power, it being provided with a rotary or centrifugal pump, A, which takes in water through conduits B, leading to the bow of the vessel, and discharges that water through conduits B', at the stern of the vessel, thereby serving to propel the vessel ahead. The invention may, however, with equal advantage,

be embodied in vessels provided with other propelling means, as the invention relates only to devices employed in steering or turning the vessel.

I have here represented the vessel as provided at the bow with a lateral passage, *a*, the ends of which are presented at opposite sides of the hull, and with a supplemental passage, *a'*, extending forward to the bow of the vessel. The portions *a a'* form a T-shaped passage, one orifice of which is presented at the bow and the other two orifices of which are presented at opposite sides of the vessel at a point very near the bow.

b designates a supply-pipe for fluid under pressure, which passes through a stuffing-box, *b'*, into the passage *a*, and is, within said passage, provided with a laterally-presented jet tube or nozzle, *b²*. The upper end of the pipe *b* is fitted within a head or socket, *b³*, from which a pipe, *b⁴*, leads to the boiler C. This enables the pipe *b* to be readily turned, and in all positions to receive a supply of fluid through the pipe *b⁴* and head *b³*.

By turning the pipe *b* the jet-nozzle *b²* may be presented toward either of the three orifices of the passage *a a'*, and the jet of fluid issuing forcibly from this nozzle will drive the water from the portions *a* or *a'* of the passage, and by the reactionary force will tend to move the vessel in a direction opposite to that in which the jet of fluid flows from the nozzle *b²*. For example, when the pipe *b* is turned to bring the nozzle *b²* in line with the portion *a'* of the passage, a jet of fluid will be ejected in a direction directly toward the bow, and will, by reaction, tend to move the vessel rearward or back. In like manner, when the pipe *b* is turned so as to present the nozzle *b²* toward either orifice of the portion *a* of the passage, the jet of fluid will be ejected in a direction transversely to the length of the vessel, and, issuing from the orifice of the passage *a*, will tend to move the vessel in the opposite direction or turn it. It is advantageous to have the nozzle *b²* of some length extending from the pipe *b*, in order to properly control the current of fluid, and it is also advantageous to have the orifices or ends of the passages *a a'* of not too great size.

I have here represented the passages *a a'*

as constructed with an enlargement, a^* , at their junction, which affords ample room for the nozzle b^2 , when the pipe is turned, and which enables the orifices of the passage a' to be maintained of small size. Near the stern of the vessel I have represented a second, passage, a , the ends of which are presented at opposite sides of the vessel, and in which is a fluid-supply pipe, b , provided with a laterally-presented nozzle, b^2 , and entering the passage a through a stuffing-box, b' . This passage a is also enlarged at a^* between the ends, in order to afford room for the turning of the nozzle b^2 , and this pipe also is fitted at the upper end in a head, b^3 , which is supplied with fluid through a pipe, b^4 , and in which the pipe b may be turned.

The pipes b^4 may be supplied with fluid under pressure from any suitable source—such, for example, as an air-compressor, a gas-generator, or from a boiler, C, as represented in this example of the invention. I have represented in the pipes b^4 valves b^5 , which may be opened and closed by hand-wheels b^6 , which may be arranged in the pilot-house D of the vessel, and which control the flow of steam through either of the pipes b^4 .

In order to turn the fluid-supply pipes b when desired, I have represented in the pilot-house D a steering-wheel and windlass, e , from which lead ropes or cables e' , passing over pulleys e^2 upon the pipes b , and serving to transmit to said pipes the motion necessary to turn them.

I am aware that it is not new to provide upon a vessel pipes through which fluid may be forced under pressure, and which are provided outside the vessel with elbows or pivoted nozzles capable of being turned to direct the fluid issuing from them in different directions. In this class of apparatus the fluid which is discharged from the elbows or nozzles acts directly upon the body of water surrounding the vessel, and it does not act within a passage formed in the hull of the vessel, as in my case. When the jet-nozzle is arranged within the passage formed in the hull of the vessel, the stream of water issuing from the jet-nozzle not only serves to turn the vessel by pressure on the water at the end of the passage toward which it is turned, but it also produces a suction at the opposite end of the passage, and so has a double effect in turning the vessel. I

am also aware that in an apparatus for the hydraulic propulsion of vessels it is not new to provide a pipe extending to the stern, through which water is forced for propelling the vessel ahead, and also to provide said pipe with a branch or bend presented forward and a valve whereby the current of water may be delivered either through the pipe, which extends directly rearward, or through the branch, which is presented forward, as may be desired, for going ahead or backing. I do not desire to include in my invention anything described above as old.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a vessel having a lateral passage, a , extending transversely across the hull and open to the water at the ends, of a supply-pipe, b , for fluid under pressure, extending into said passage at an angle thereto, and provided therein with a laterally-projecting jet-nozzle, b^2 , the supply-pipe being rotatable to present the said nozzle b^2 toward either orifice of the passage, substantially as herein described.

2. The combination, with a vessel having a lateral passage, a , extending transversely across the hull and open to the water at the ends and internally enlarged between the ends, of a supply-pipe, b , for fluid under pressure, extending into said passage at an angle thereto, and therein provided with a laterally-projecting jet-nozzle, b^2 , the pipe being rotatable to present the nozzle toward either orifice of said passage, and the enlargement in the passage affording room for the turning of the nozzle without increasing the size of the passage at the ends, substantially as herein described.

3. The combination, with a vessel having at the bow a passage, a , extending transversely across the hull, and having a branch, a' , leading directly to the bow, of a supply-pipe, b , for fluid under pressure, extending into the passage a at an angle thereto, and having a laterally-presented outlet or nozzle, and rotatable to present said outlet or nozzle toward either of the three orifices of said passage, substantially as herein described.

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Witnesses:

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