No. 718,881. PATENTED JAN. 20, 1903.

O. E. SARR.

PROPELLER WHEEL.

APPLICATION FILED JUNE 12, 1902.

NO MODEL.

Fig. 1.

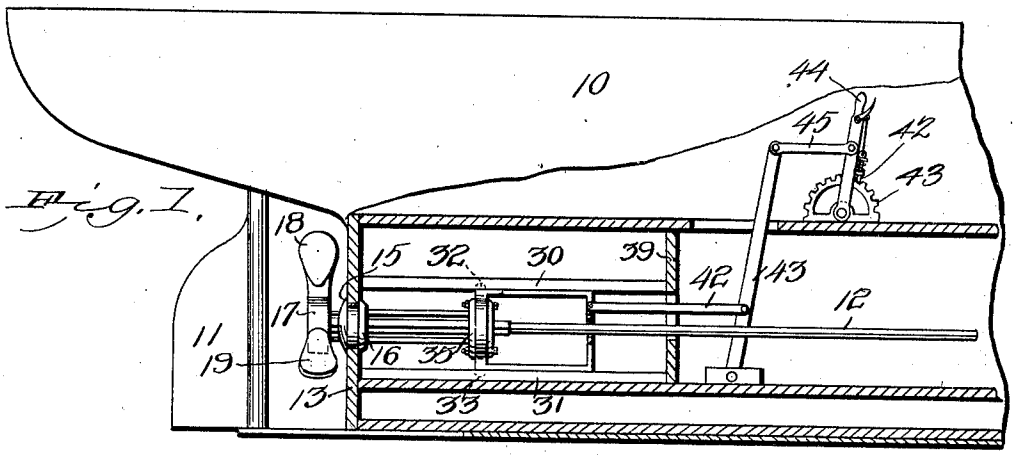


Fig. 3.

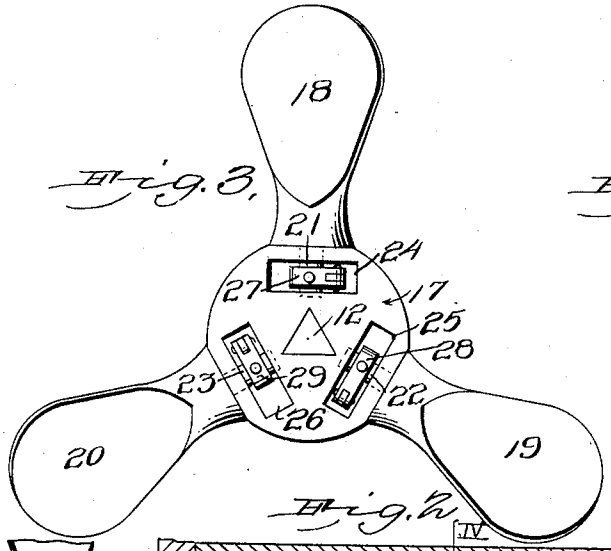


Fig. 4.

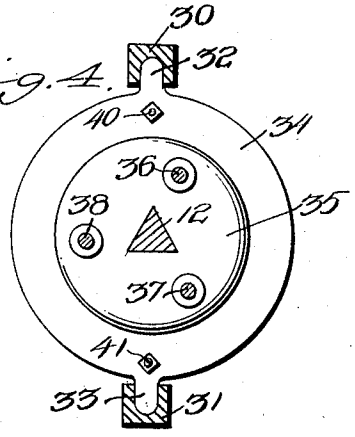
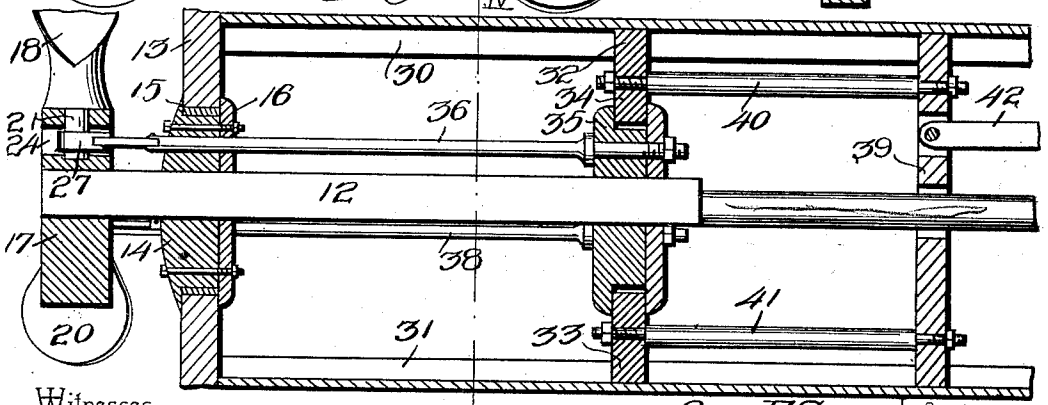


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

ORA ELZER SARR, OF CEYLON, OHIO, ASSIGNOR OF ONE-HALF TO DELLA SARR, OF CEYLON, OHIO.

PROPELLER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 718,881, dated January 20, 1903.

Application filed June 12, 1902. Serial No. 111,379. (No model.)

To all whom it may concern:

Be it known that I, ORA ELZER SARR, a citizen of the United States, residing at Ceylon, in the county of Erie and State of Ohio, have invented a new and useful Propeller-Wheel, of which the following is a specification.

This invention relates to improvements in the means for the propulsion of vessels of the class employing screw-propellers; and the invention has for its object the production of a screw-propeller in which the propeller-blades may be moved in the hub to reverse their position, so that the movement of the vessel may be reversed without reversing the engines, and also to provide for altering the "pitch" of the blades without stopping the engine.

The invention consists in certain novel features of the construction, as hereinafter shown and described, and specified in the claims.

In the drawings illustrative of the invention, Figure 1 is a side elevation, partially in section, of the stem portion of the vessel with the invention applied. Fig. 2 is an enlarged sectional detail of the operative parts. Fig. 3 is an enlarged view of the propeller-wheel detached. Fig. 4 is a section on the line IV IV of Fig. 2.

The invention may be applied to any of the various forms of vessels driven by screw-propellers, and for the purpose of illustration it is shown applied to a conventional form of vessel, 10 representing the hull, 11 the rudder, and 12 the main drive-shaft, adapted to be operated by engines in the ordinary manner, the engines and their connections not being shown, as they form no part of the present invention. The outer end of the main shaft is formed in irregular shape, preferably triangular, as shown, so that the parts attached to it, being correspondingly irregular in their interiors, will revolve with the shaft. At the point where the shaft passes through the stern-post (indicated at 13) it will be provided with a suitable packing mechanism consisting of a disk 14, embracing the shaft closely, and with a flange 15 on its exterior, in engagement with the outer surface of the stern-post 13 and with a plate 16, attached to the interior of the plate 14 and likewise embracing the interior of the stern-post, by which means a water-tight joint will be formed between the parts 14, 15, and 16 and the stern-post, while at the same time free to be revolved in the stern-post with the shaft.

The propeller-wheel hub (indicated at 17) is attached to the outer end of the shaft 12 and partakes of its motion.

The blades of the propeller are indicated at 18, 19, and 20 each with a stud 21, 22, and 23, respectively, the studs fitting into cavities formed for them at equal distances apart in the rim of the hub. As many of the blades may be employed as required; but generally three will be sufficient, as shown.

Within the hub 17, opposite the studs of the propeller-blades, are apertures 24, 25, and 26, and within each aperture the studs are provided with arms 27, 28, and 29, respectively, the arms providing for the oscillation of the propeller-blades upon their studs, as hereinafter explained.

Within the vessel, adjacent to the stern-post 13 and extending inwardly therefrom, are tracks 30 31, spaced apart at equidistant points, preferably above and below the shaft 12, these tracks having channels in their adjacent faces and adapted to receive projections 32 33 upon an annular casing or collar 34. Within this collar 34 is revolubly secured a hub 35, slidably disposed upon the shaft 12 and partaking of its motion.

Connected to the hub 35 are rods 36, 37, and 38, extending rearwardly and passing slidably through the packing mechanism 14, 15, and 16, and connected, respectively, to the outer ends of the arms 27, 28, and 29, as shown.

Slidably supported between the tracks 30 31 is a traveler 39, connected by rods 40 41 to the frame 34, as shown, and attached to the traveler is a rod 42, leading forward and connected to an operating-lever 43. Two of the rods 42 will preferably be employed, lying side by side; but one only is shown.

The lever 43 is arranged to be actuated by another lever 44, connected thereto by a link 45, by which means the leverage is materially increased, the lever 44, provided with a spring-pawl 42, engaging a notched segment 43. By this mechanism it will be understood that when the frame 34 is moved longitudinally of the shaft which is revolving within it the

rods 36, 37, and 38 will act upon the arms 27, 28, and 29 and oscillate the propeller-blades within the hubs upon their studs 21, 22, and 23, so that by merely operating the lever 43 the angle of the propeller-blades may be altered to any extent while in motion or completely reversed, as may be desired, so that the speed of the vessel may be quickly altered or the motion reversed without stopping or reversing the engines.

If it is desired to simply alter the inclination of the blades to increase or decrease the pitch of the blades, this may be done by adjusting the lever 43 to a limited extent, which action will increase or decrease the speed by increasing or decreasing the pitch or inclination of the blades. If, however, it is desired to reverse the motion of the vessel, the lever 43 will be thrown over a distance sufficient to reverse the position of the blades and cause them to engage the water from the opposite side and without reversing or otherwise affecting the engines. By this simple means the direction of motion of the vessel may be altered or the speed controlled by simply manipulating the mechanism governing the propeller-blades.

The various parts of the apparatus will be constructed with sufficient strength to withstand the severe strains to which they will be subjected and will be modified to suit different constructions of vessels.

This device is particularly applicable and valuable in connection with that class of engines which can be advantageously operated at a high speed only—such as turbine-engines and some forms of gas and hydrocarbon engines—and also in connection with some forms of electric engines. The invention is also particularly valuable in connection with that class of engines which can be run to advantage only in one direction or in engines which it is difficult or impossible to readily reverse, as in this apparatus the propeller-blades can be adjusted reversely or at any desired angle to the axis of the drive-shaft to cause them to exert any desired degree of force upon the submerging fluid, or reversed or adjusted at right angles to the drive-shaft, and thus revolving in the submerging fluid without exerting any propelling force whatever in either direction. By this means the engine may be run constantly in one direction and at uniform speed and the speed or direction of the vessel, either forward or backward, controlled entirely by the wheel.

In vessels employing "twin screws" the vessel may be very readily and conveniently steered wholly by the screw-propellers by merely inclining the blades of one propeller to a greater or lesser extent than the other, as will be readily understood. A vessel thus equipped is entirely independent of the ordinary steering apparatus, and in event of accident to the latter the vessel could be controlled entirely by the propeller-wheels, both as to speed and direction, either forward or backward.

Having thus described my invention, what I claim is—

1. In a screw-propeller, the propeller-shaft, spaced propeller-blades movably supported upon said shaft, spaced tracks parallel to said shaft, a frame slidably disposed between said tracks and inclosing said shaft, a hub slidable upon said shaft and revolubly disposed within said frame, rods connecting said hub and said propeller-blades, and means for adjusting said frame and hub longitudinally of said shaft, whereby the pitch of said blades will be simultaneously and correspondingly altered, substantially as described.

2. In a screw-propeller, the propeller-shaft, spaced propeller-blades movably supported upon said shaft, a frame slidably disposed within the vessel and inclosing said shaft, a hub slidable upon said shaft and revolubly disposed within said frame, means for adjusting said frame and hub longitudinally of said shaft, and means between said frame and propeller-shaft whereby the movement of said frame will cause said blades to be adjusted to simultaneously alter their pitch to a corresponding degree, substantially as described.

3. In a screw-propeller, the drive-shaft, a packing means revoluble with the shaft and engaging the vessel, a hub upon the shaft outside the vessel and having radially-disposed spaced sockets in its periphery, spaced propeller-blades having studs engaging said sockets, rods passing slidably through said packing means and connected to said studs, and means connected to said rods within the vessel and adapted to operate them to cause said blades to be simultaneously and correspondingly adjusted to alter their pitch or reverse their position, substantially as described.

4. In a screw-propeller, a drive-shaft, a packing means revoluble with the shaft and engaging the vessel, a hub upon the shaft outside the vessel and having spaced sockets radially disposed in its periphery, spaced propeller-blades having studs engaging said sockets, apertures in said hub intersecting said sockets, arms upon said studs within said apertures, rods passing through said packing means and engaging said arms, and operative means connected to said rods within the vessel, substantially as described.

5. In a screw-propeller, a propeller-shaft, a packing means revoluble with the shaft and engaging the vessel, spaced propeller-blades carried by said shaft, a frame slidably disposed and inclosing said shaft, a hub slidable upon said shaft and revolubly disposed in said frame, means for adjusting said frame and hub longitudinally of said shaft, rods connecting said hub and the propeller-blades through said packing means, and means for adjusting said frame and hub longitudinally of said shaft, whereby the pitch of said blades

will be simultaneously and correspondingly altered, substantially as described.

6. In a screw-propeller, a propeller-shaft, spaced propeller-blades movably supported upon said shaft, spaced tracks parallel to said shaft, a frame slidably disposed between said tracks and inclosing said shaft, a hub slidable upon said shaft and revolubly disposed within said frame, connecting means between said hub and propeller-blades, a traveler disposed between said tracks forward of said slidable frame, rods connecting said traveler and slidable frame, an operating-lever, and a rod connecting said operating-lever and said traveler, whereby said traveler and its connected slidable frame may be adjusted longitudinally of the shaft and thereby simultaneously and correspondingly adjust the pitch of the propeller-blades, substantially as described.

7. In a screw-propeller, a propeller-shaft, a packing means revoluble with the shaft and engaging the vessel, a hub upon the shaft outside the vessel, spaced sockets radially disposed in the periphery of the hub, spaced propeller-blades having studs respectively engaging said sockets, apertures in said hub intersecting said sockets, arms engaging said studs within said apertures, a frame slidably disposed within said vessel and inclosing said shaft, a hub revolubly disposed within said frame and slidable upon said shaft, rods passing slidably through said packing means and connecting said hub and said arms within said apertures, and means engaging said slidable frame and adapted to adjust it longitudinally of said shaft, whereby said propeller-blades may be adjusted to simultaneously and correspondingly alter the pitch or reverse their positions, substantially as described.

8. In a screw-propeller, the drive-shaft, a packing means consisting of a disk upon the shaft within the wall of the vessel and having a circumferential flange extending therefrom and engaging the vessel on the interior, and with a plate attached to the disk exteriorly of the vessel and engaging it adjacent to the disk, a hub upon the shaft outside the vessel, spaced propeller-blades movably supported in said hub, and means whereby said blades will be adjusted to alter their pitch to a corresponding degree, or to simultaneously reverse their positions, substantially as described.

9. In a screw-propeller, the drive-shaft having the outer portion irregular in cross-section, a packing means revoluble with the irregular portion of said shaft and engaging the vessel, a hub engaging the outer end of said shaft, propeller-blades movably supported in said hub, and means whereby said blades will be adjusted to simultaneously alter their pitch to a corresponding degree, or to simultaneously reverse their positions, substantially as described.

10. In a screw-propeller, the drive-shaft, propeller-blades movably supported upon said shaft, a packing means revoluble with the shaft and movably engaging the vessel, rods movably engaging said packing means and revoluble therewith, means between said rods and said propeller-blades whereby said blades will be simultaneously adjusted to alter their pitch to a corresponding degree, or be simultaneously reversed in position, and means within the vessel for operating said rods, substantially as described.

11. In a screw-propeller, the drive-shaft, a packing means revoluble with the shaft and engaging the vessel, propeller-blades movably supported upon said shaft, means connected to said propeller-blade-operating mechanism and movably engaging said packing means and revoluble therewith, and means operative within the vessel whereby said connecting means will adjust said blades to simultaneously alter their pitch to a corresponding degree or simultaneously reverse their positions with reference to the drive-shaft, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ORA ELZER SARR.

Witnesses:
A. H. PEARL,
ELIZA I. PEARL.