

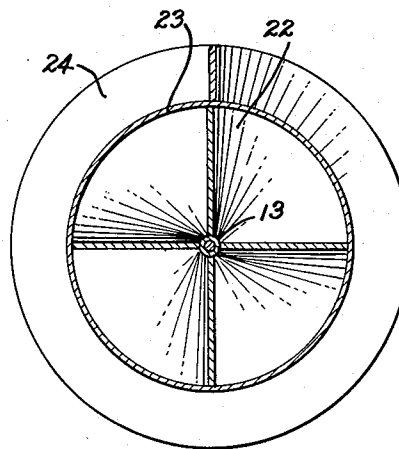
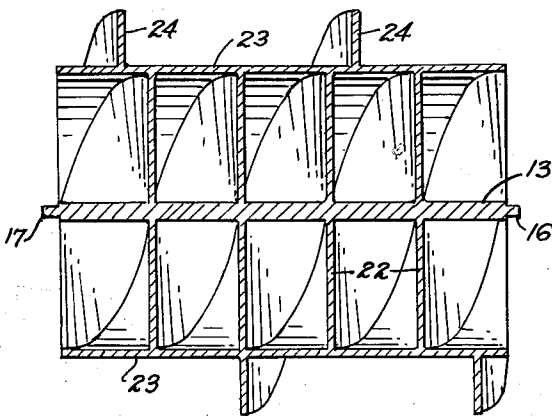
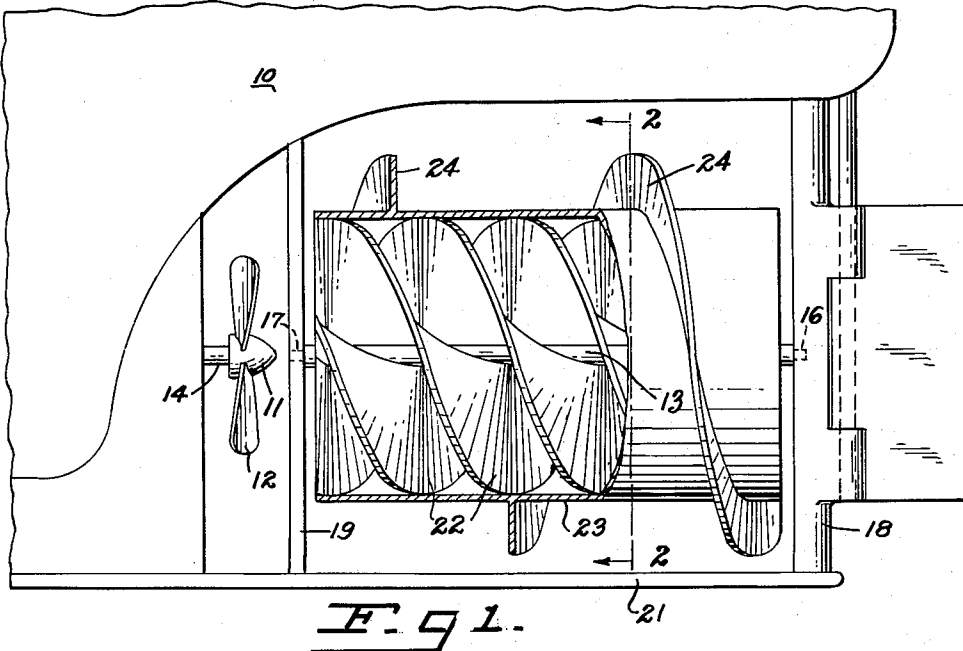
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PROPELLER CONSTRUCTION FOR WATERCRAFT

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PROPELLER CONSTRUCTION FOR WATERCRAFT

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This invention relates to new and useful improvements in propeller construction for water craft and has for its principal object the increasing of the efficiency of the propulsive force imparted to the vessel with which it is connected.

The instant invention entails the use of an auxiliary driving propeller, which may be referred to as a secondary propeller, to convert the energy in the backward surge of water from the ordinary or primary propelled into useful work for driving the vessel. It will be understood that ordinarily much of the power used to drive a propeller is wasted in that energy is dissipated in creating a surge of water which serves no useful purpose in driving a ship, and thus, the propeller is inefficient. Accordingly, the instant invention improves the efficiency of the propeller by converting a portion of the energy thereof in the performance work directed toward driving the ship. Without increasing the amount of power required by the engine, the speed of the vessel is increased.

Other objects and advantages will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

Fig. 1 is a side elevation of the stern of a ship on which the instant device has been installed, a portion of the device being broken away in section.

Fig. 2 is a transverse section taken substantially along the line 2—2 of Fig. 1.

Fig. 3 is a longitudinal, vertical section of the secondary propeller.

As illustrated in the accompanying drawings, in an ordinary vessel 10, there is installed at the stern below the water line a propeller 11 which is turned by the engine (not shown) of the ship. As the propeller revolves it forces the ship forward by reason of the pitch of the propeller blades 12. In so driving the ship, the propeller also churns the water adjacent its path of travel and produces eddy currents or what may be termed "surge" effect. The energy expended in creating said effect is wasted in ordinary installations, so far as the propulsive efficiency of the vessel is concerned. My invention involves the utilization of this otherwise wasted energy. Accordingly I suspend from the vessel a shaft 13, which is horizontally disposed and preferably coaxial with the propeller shaft 14. The shaft 13 is supported for free rotation in journals 16 and 17 in the rudder post 18 and an auxiliary vertical

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support 19 respectively. The lower ends of the rudder post 18 and vertical support 19 are connected to a horizontal member 21 which is in turn connected to the ship adjacent the keel. Thus, the shaft 13 is rotatably mounted so that it may freely revolve, but the thrust imparted to said shaft, as hereinafter described, is directly transmitted to the ship and assists in driving the ship.

Disposed about and rigidly connected to the shaft 13 is a plurality of inner blades 22 of curved, inclined helical configuration and surrounding the periphery thereof is a hollow cylindrical casing 23 coaxial with the shaft 13. Disposed around the exterior of the casing 23 is a helical, inclined outer blade 24. The inner blades 22, cylindrical casing 23 and outer blade 24 are integrally formed or rigidly connected for rotation together with the shaft 13. It will be observed that the diameter of the casing 23 is preferably considerably greater than that of the primary propeller 12 and that the casing is disposed only a slight distance behind the propeller 11 so that substantially all of the water forced back by the primary propeller is trapped within the cylindrical casing. This water impinges against the inner blades 22 and accordingly the assembly consisting of a shaft 13, inner blades 22, casing 23 and outer blades 24 is caused to revolve by reason of the helical conformation of the inner blades 22 in the same direction as shaft 14. The outer blades 24 are located in a zone where the water is relatively quiescent and hence as they revolve through the water they tend to impart a thrust to the shaft 13 which drives the ship forward. The drive from the secondary propeller is obtained without the use of any additional power and hence the additional thrust is used to increase the efficiency of the vessel.

It will be understood that the secondary propelling unit rotates freely on its own axis 13 and is not connected to the primary propeller 11 but its rotation is accomplished by utilizing the backwash or surge of the primary propeller. It will further be understood that although as shown in the accompanying drawings four inner blades 22 are used, the number of said blades may be increased or decreased as desired depending upon the particular installation in which the secondary propeller is made. Similarly, a single helical outer blade 24 is shown, but it is understood that several such blades may be employed. The respective pitches of the inner and outer blades is also a matter of design which may be varied depending upon the installation. While the invention has been described in

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rather specific detail by way of illustrations and example for purposes of clarity of description, it is understood that various changes and modifications in structure, use and assembly may be practiced within the spirit of the invention and scope of the appended claims.

I claim:

1. A water craft comprising, a hull, a primary propeller extending rearwardly from said hull, a frame depending from said hull rearwardly from said primary propeller, journal bearings in said frame, and a secondary propeller supported by said frame and journaled in said bearings, said secondary propeller being mounted immediately rearwardly of and independently of said primary propeller, said secondary propeller comprising, an elongated, cylindrical, hollow casing having its axis of rotation substantially aligned with the axis of rotation of said primary propeller, the inner diameter of said secondary propeller being substantially greater than twice the radius of the blades of said primary propeller, whereby to receive substantially all of the surge of said primary propeller, a central shaft within said casing, a first helical, inclined blade interposed between said shaft and said casing and rigidly joining the two together, said first helical blade having a plurality of turns in a direction such that surge from said primary propeller causes said secondary propeller to revolve in the same

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direction as said primary propeller, and a second inclined helical blade disposed exteriorly of said casing and having a plurality of turns in the same direction as said first helical blade.

2. A craft as defined in claim 1 in which the pitch of said second helical blade is substantially less than that of said first helical blade.

3. A craft as defined in claim 2 in which said first helical blade is multiple-threaded and said second helical blade is single-threaded.

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(Addition)