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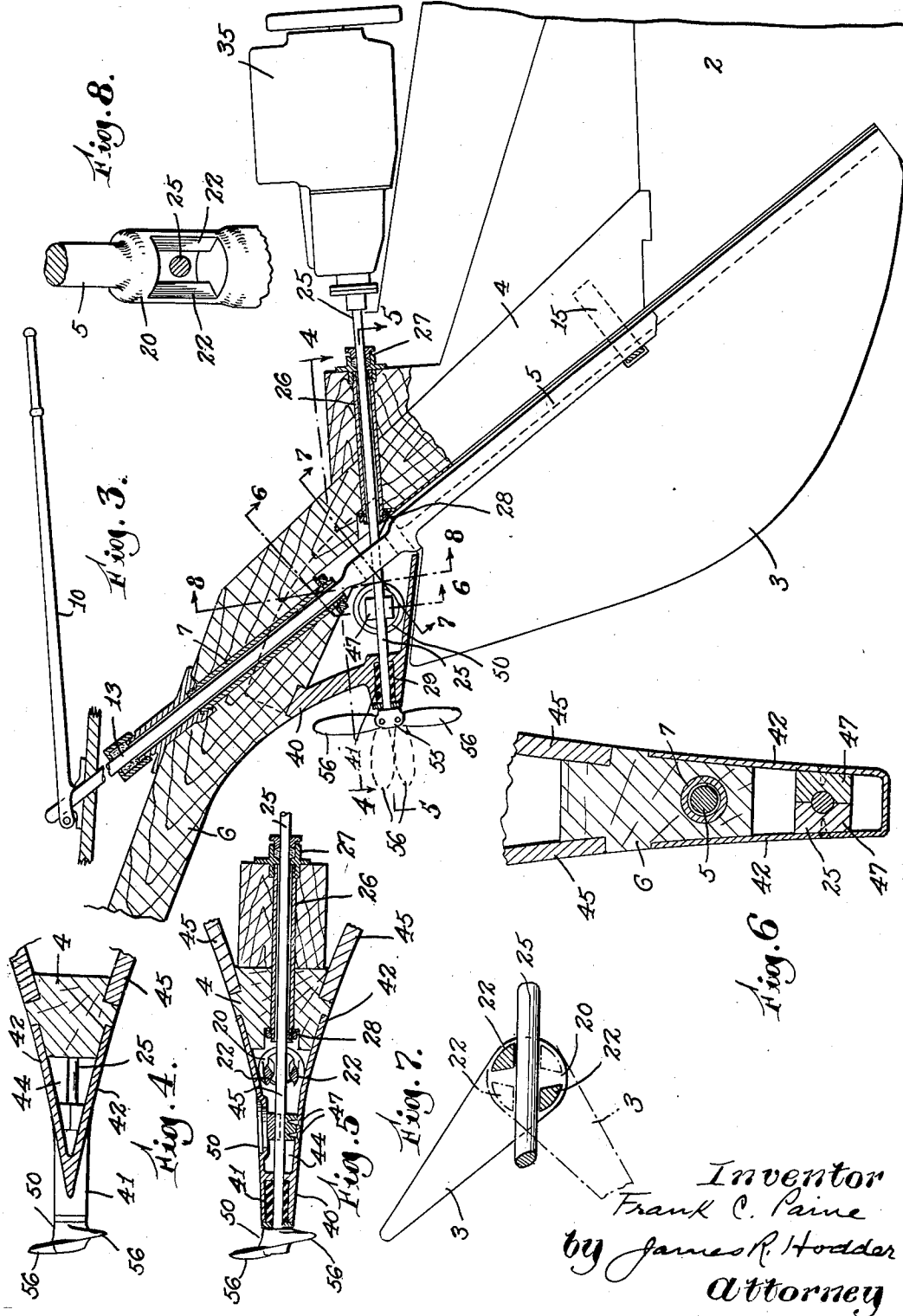
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SHIP CONSTRUCTION

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SHIP CONSTRUCTION

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My present invention consists in a novel and improved method of constructing ships, vessels, yachts, or the like, and particularly in the arrangement of rudder posts and propeller shaft.

My improved method also results in many benefits and advantages to the improved ship design and structure, and I wish to claim herein both the method and the resultant improved construction of my present invention.

Heretofore, in the installation of power-driven vessels it has been customary to so design and construct the ship or vessel that the propeller works either in a slot or opening in the keel or deadwood just ahead of the rudder and rudder posts, or in a recess partly in the rudder and partly in the deadwood, or at one or both sides of the rudder, the propeller shaft being held by struts projecting from the stern portion of the vessel.

In both of these prior methods of installation, the propeller was ahead of the rudder and, therefore, exerted a disturbing influence on the water impelled against the rudder by the propeller during the operation of same. Particularly were these prior constructions objectionable in building yachts where speed, efficiency, appearance and delicacy of steering are most important. The drag of a propeller, particularly in sailing yachts and vessels with auxiliary power, has always been a constant and annoying problem. This difficulty with sail and power-driven yachts has been well recognized so that it is universally customary to make an allowance for the drag of the propeller and propeller slot or opening in all yacht racing rules and regulations.

A further and constant difficulty experienced with prior installations where the propeller was off-center or at one side has been the trouble with steering, particularly in the smaller sized auxiliary sail and power vessels, since the thrust of the propeller against one side of the rudder caused constant difficulty in steering as well as waste of power, in addition to the yawing tendency caused by the propeller thrust at one side of the center.

My present invention aims to eliminate the difficulties above briefly outlined as well as others, and by my method I provide an installation of power-driven propeller construction at the stern of the vessel, permitting the propeller to be centered, eliminating propeller slots or openings in the deadwood or rudder, preventing all distorting lateral thrusts against the rudder by the propeller, and furthermore keeping both the rudder and the propeller in undisturbed water and

hence efficient, as well also as providing for complete streamlining design and model in the ship or vessel constructed in accordance with my present invention, and also reducing the drag of the propeller to a minimum.

Further important features of my present invention consist in enabling the power plant of a yacht or vessel to be more conveniently, compactly, and advantageously positioned in the inside of the hull and still give a direct drive between the power plant and the propeller and on substantially a horizontal line, all irrespective of the angle, depth, or position of the stern post, rudder post, and rudder itself.

In carrying out my present invention by my improved method, I so construct and arrange the rudder post and propeller shaft as to permit and provide for the propeller shaft to extend directly and centrally thru the rudder post and still permit a full swinging or turning action of the rudder post for steering. Furthermore, my invention permits the relative angle between the propeller shaft and the rudder post to be designed at any desired position, turning freely while extending centrally thru the rudder post, and the rudder turning freely thruout the angle of its desired efficiency for steering; and, furthermore, with the rudder free of any distorting thrust from the propeller, and the propeller being positioned for its greatest efficiency and free of any thrusting of the water therefrom against any part of the rudder, rudder post, or other portion of the vessel.

Thus by my present invention both the rudder and the propeller are permitted to function fully and freely in their fullest efficiency and free of any disturbing influence between the two, while furthermore permitting a highly desirable streamlining of the vessel's design with all distorting drag from the propeller entirely eliminated, and with the drag of the propeller itself reduced to a minimum.

While I may utilize either a solid, a folding or a feathering type of propeller, I prefer to use the folding type as still further carrying out the streamlining and the minimizing of the resistance and drag from the propeller when installed in a sailing yacht and when the yacht is under sail alone.

In carrying out my present invention I so enlarge and construct the rudder post, enlarging the same if necessary for strength to provide an opening therethru, permitting the propeller shaft to extend freely thru this opening in the rudder post and, hence, centrally of the ship or vessel in which

it is installed. Preferably, also, I extend the propeller shaft a sufficient distance rearwardly of the rudder post so as to clear the blade of the rudder and thus permit the propeller to operate freely as well as centrally and astern or back of the rudder. By these means I am enabled to eliminate the disturbing and distorting drag and influence of the propeller as well as to improve the installation and efficiency of the power plant by the central drive in alignment with the keel of the vessel and permit the streamlining of the hull below the water line to be carried out most efficiently as well as presenting numerous other advantages, such as the simpler and stronger construction of rudder posts and rudder free of propeller slots, enabling the weight of the engine to be more efficiently positioned in the vessel, as well as centrally of the same, usually shortening the propeller shaft and also enabling it to be more equally horizontal in its relation to the vessel and, hence, more efficient in driving power, while presenting a strong, rigid construction at the stern portion of the vessel.

Referring to the drawings illustrating preferred embodiments,

Fig. 1 is a side view of a typical auxiliary sail and power vessel constructed in accordance with my present method;

Fig. 2 is an enlarged fragmentary stern view showing the propeller in operative position and the rudder turned substantially at its extreme limit to starboard;

Fig. 3 is an enlarged side view partly in cross-section of the rudder post and propeller installation of my present invention;

Fig. 4 is a cross-sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a cross-sectional view on the line 5—5 of Fig. 3;

Fig. 6 is a cross-sectional view on the line 6—6 of Fig. 3;

Fig. 7 is a cross-sectional view on the line 7—7 of Fig. 3;

Fig. 8 is a fragmentary cross-sectional view on the line 8—8 of Fig. 3, and

Fig. 9 is a view of a modified form.

As shown in the drawings, a typical hull 1 of an auxiliary sailing and power yacht is illustrated, showing the keel 2 in outline and the rudder 3 which extends lengthwise of the rudder post 4 and into a pintle in the keel 2, the rudder 3 being carried by a rudder post 5 extending thru the upper part of the rudder post 4 and horn timber 6, thru a pipe 7 to a tiller 10. Bearings 12 and 13 are shown fitted as is customary at either ends of the pipe 7 in addition to the retaining strap 15 around the central portion of the rudder post and secured to the stern post affording proper bearings for the rudder.

At the position where it is desired the propeller shall extend, I so form and construct the rudder post 5 with an enlarged hub 20 to permit recessing said hub while still retaining proper strength therein to allow the propeller shaft 25 to extend therethru. While this slot, opening, or recess thru the rudder post for the propeller shaft may be of any desired construction and arrangement to permit the rudder to turn around that part of the propeller shaft which extends thru it and still give sufficient strength in the rudder post, I prefer to form the same as herein shown, viz., with conical openings thru the rudder post at front and rear, leaving segmental V-shaped sections 22—22 with the corner of the V positioned centrally or axially of the rudder

post 5, thus facilitating a full capacity for turning of the rudder at either side of the propeller shaft by reducing the metal in the hub 20 to a minimum extent, while providing full strength in the rudder post.

As shown in Fig. 7, a plan view illustrates the rudder blade 3 turned to port, and as shown in dotted lines with the rudder blade turned to starboard, illustrating the capacity for such operation without interference with the propeller shaft 25, the V segmental sections 22 thus permitting the hub section 20 in the rudder post to be but slightly larger than the normal diameter of the post itself. In fact, as shown in the drawings the lower portion of the rudder post 5 where the blade 3 is folded or otherwise secured thereto is of slightly larger diameter than that of the hub 20 thru which the propeller shaft 25 passes.

While any suitable installation of power plant can be employed for operating the propeller shaft 25, I have herein illustrated an engine 35 of standard type and compact form coupled directly to the propeller shaft 25 and showing the capacity for having the engine at a lower center of gravity relatively with the hull and yet with the propeller shaft 25 substantially horizontally for more efficient operation of the propeller.

As herein illustrated in the drawings, the propeller shaft 25 is fitted thru a pipe 26 having an inner bearing 27 with watertight packing and a bearing 28 at the outer end in the bored opening thru the stern post.

In the particular form shown in Figs. 1 and 3 to 8, I have illustrated my invention of carrying the propeller shaft thru the rudder post with the streamlining of the hull of the vessel 1 carried out beyond the rudder post and directly to the end of the propeller shaft for a strut or brace therefor at the outer bearing 29.

For this purpose I have shown in connection with the design herein illustrated a rear bracket or casting 40 fitted to and secured in the upper part of the rudder post or horn timber, as shown in Fig. 3, and carrying the outer shaft bearing 29 in the hub 41 of suitable length and diameter, and being provided also with a pair of side extensions or wings 42—42 extending forwardly and flaring outwardly to the stern post 4 and carrying clear to the propeller the streamlining of the plank 45 at this point and, hence, carrying out the lines of the hull to prevent drag. The strut 40 and wings 45 are preferably formed as a single metal casting, leaving an interior opening 44 into which water may penetrate without affecting the design.

In order to prevent chattering of the propeller shaft 25 between the forward inner bearing 27 and the outer bearing 29, I may fit a pair of blocks of wood or other material 47 about the shaft 25 and within the hollow space between the wings 42, 42, providing a hand-hole opening at 50 for this purpose which, when covered by a plate, will continue streamlining of the hull lines as above explained.

While I may utilize any desired propeller as above noted, I have herein illustrated a type of folding blade propeller having a central hub 55 with twin propeller blades 56, 56 adapted to be thrust into operative position, as shown in full lines in Fig. 3, when the motor 35 is running and the shaft 25 rotating, but which will be automatically folded rearwardly, as shown in dotted lines in Fig. 3, when the propeller shaft 25 is not rotated, thus still further carrying out the stream-

lining effect and practically reducing all drag of these propeller blades.

As shown in Fig. 9, I have illustrated a modified form wherein the propeller shaft 25 is extended directly thru the rudder post 5 and hub 20 without the streamlining afforded by the strut 40 and wings 42 as just explained, but with a single standard type of strut 60 having a bearing 67 for a propeller shaft 25 and utilizing either a solid or feather type of propeller with blades 61—61 secured to a hub 66. In either form my invention enables the propeller to be positioned centrally of the hull and rearwardly of the rudder, thus permitting the rudder to operate freely and independently of any disturbing thrust or drag from the propeller, while the propeller is equally enabled to operate freely in substantially undisturbed water, and both propeller and rudder are constructed and arranged for greatest efficiency.

I claim:

1. Improved ship and vessel construction of the kind described, consisting in a rudder post and stern post formed to receive an engine propeller shaft therethru, a propeller shaft extending thru

said rudder post, said propeller shaft carrying a propeller rearwardly of and above the rudder, and said opening thru the rudder post being constructed and arranged to permit full turning capacity of the rudder without interference from the propeller, in combination with a streamlined housing partially enclosing said shaft and secured to the hull above the rudder.

2. Ship construction of the kind described, comprising streamlined hull construction under the stern post, a rudder post extending adjacent the stern post and being apertured to receive a propeller shaft extending thru said rudder post and streamlined portion, a rudder blade secured to said rudder post below said streamlined hull portion, and arranged forwardly of the propeller affixed to said propeller shaft, the propeller aperture thru said rudder post being formed with diametrically opposite V-shaped solid sections in the rudder post to permit the propeller shaft extending therethru to be free of interference during the turning of the rudder to its angle of efficiency at either side of the ship construction.

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