

994,709.

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UNITED STATES PATENT OFFICE.

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PROPELLER-SHAFT STUFFING-BOX.

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To all whom it may concern:

Be it known that I, CHARLES B. ADAMS, a citizen of the United States, residing at Charleston, in the county of Charleston and State of South Carolina, have invented certain new and useful Improvements in Propeller-Shaft Stuffing-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to improvements in stuffing boxes for propeller shafts, being particularly designed and adapted for use on the outboard end of the shaft for preventing the ingress of water around the shaft.

The objects of the invention are to provide a structure which will be self-compensating for wear, whereby adjustment, save at long intervals, becomes unnecessary, and whereby the bending of the outboard end of the shaft will not cause the same to bind in its bearings, or result in destructive wear on the packing to an extent which will permit a leakage.

The invention consists in certain novel details of construction and combinations and arrangement of parts, all as will be herein-after described and pointed out particularly in the appended claim.

In the accompanying drawings,—Figure 1 is a section in a longitudinal plane through a stuffing box embodying the present improvements, the propeller shaft and propeller being shown in elevation; and Fig. 2 is an elevation of one of the antifriction thrust bearings interposed between the adjustable cap and packing within the box.

Like letters of reference in the several figure indicate the same parts.

In said drawings the letter A indicates the outboard end of the propeller shaft, B the propeller and C the stern post of the boat which forms a part of the dead wood.

The stuffing box of the present invention, is applied to the outer side of the stern post C and embodies in its construction a cylindrical outwardly extending box or chamber D externally screw threaded for the application of a relatively long internally threaded cap E, suitable provision, such as a lock ring E', being made for holding the cap in its adjustable position on the box D. The

box D is formed as an integral part of a base flange D' adapted for being secured firmly against the outer face of the stern post, as by lag screws d. The bearing for supporting the propeller shaft is preferably formed by a nipple or cylindrical projection F on the face of the base flange D', opposite the box D, the length of which nipple or projection largely determines the length of the supporting bearing for the shaft. It may be noted that this bearing should be of considerable length, in order to afford adequate support for the shaft, and in the present construction it is located on the inner side of the stuffing box, where it will be substantially free from water pressure and is thus enabled to retain its lubricant unaffected by the water or pressure exerted by the water.

The internal diameter of the box D is considerably greater than the diameter of the bearing F or shaft supported in said bearing, adapting it for the reception of the packing material G, the inner end of the chamber at g and the inner face of the follower H on the outer side of the packing being preferably concave or conical so as to tend to compress the packing more tightly around the shaft in a well understood manner. The follower H works entirely within the chamber of the box D, and preferably fits the chamber and shaft with a sufficient degree of accuracy to prevent the packing from squeezing past the same, although in use the compression of the packing by the follower is in the same direction in which the water pressure acts upon the same, and consequently there is but little tendency of the packing to squeeze out past the follower when the stuffing box is in use.

Between the follower H and the adjustable cap E there is, in accordance with the present invention, interposed a relatively heavy coiled spring K, the ends of which are seated on antifriction thrust bearings L which fit the shaft with a fair degree of accuracy, but which are not confined closely by either the cap or the box D. Antifriction balls l in the faces of the thrust bearings L bear against the follower H and against a bearing ring M located in the adjustable cap E, said ring M being preferably also free to move transversely in the cap to a limited extent, but takes a bearing both on the shaft and on the inner face of the cap, so as to exclude dirt or any tendency

of the water to circulate through the cap from the exterior. The aperture in the cap through which the shaft passes is preferably of somewhat larger diameter than the shaft itself.

5 The inner thrust bearing L and the inner end of the spring, together with the follower H, are all of such diameter that they may freely enter the outer end of the box 10 D and as a consequence will exert a constant pressure on the packing G, tending to hold the same compressed around the shaft, until it is practically consumed or worn away, and consequently with this form of packing 15 box it becomes possible to run a motor boat for practically an entire season without the necessity of repacking or of adjusting the same, thereby overcoming one of the difficulties in the operation of boats of this 20 character, particularly where high speed is imparted to the propeller shaft. By the provision of antifriction thrust bearings at the points indicated all danger of the spring being caught or binding in such manner as 25 to destroy the packing or the box, is practically eliminated even though the parts should be very much worn or corroded, and what is of perhaps more importance, the structure will maintain the packing in a tight 30 condition, so as to prevent leakage, even though the outboard end of the propeller shaft should be bent, as so frequently occurs when the propeller strikes an obstruction, for with the construction illustrated and described the end of the propeller shaft may 35 travel in a gyratory path, without either affecting the efficiency of the packing or

causing undue wear between the parts constituting the packing adjusting members.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is: 40

In a stuffing box for propeller shafts, the combination with the cylindrical externally threaded packing box for the reception of a 45 fibrous packing and having a base flange integral therewith for attachment to the stern post of a boat, an integral nipple projecting from said flange opposite to the stuffing box and forming an elongated shaft supporting 50 bearing, and an internally threaded relatively long cap fitting on said box and having a propeller shaft aperture therein of greater diameter than said bearing, of a follower 55 mounted to move longitudinally within the box for compressing the packing therein and fitting the box and shaft with sufficient accuracy to prevent the packing from slipping past the same, an antifriction thrust bearing cooperating with the outer side of 60 said follower, a bearing ring for the shaft located in the cap whereby entry of dirt into the cap is prevented, an antifriction thrust bearing cooperating with said ring, and a 65 coil spring interposed between said thrust bearings for compressing the packing, the compression being in the same direction in which the water pressure acts upon the packing.

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Witnesses:

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