United States Patent [19]

Wilde

[11] **3,792,938**

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[54] **PROPELLER NUT AND FAIRWATER**

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[73] Assignee: **Production Mold, Inc.,** Huntington Park, Calif.

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[52] **U.S. Cl.** **416/245,** 416/146

[51] **Int. Cl.** **B64h 1/12**

[58] **Field of Search** 416/245, 146

[56] **References Cited**

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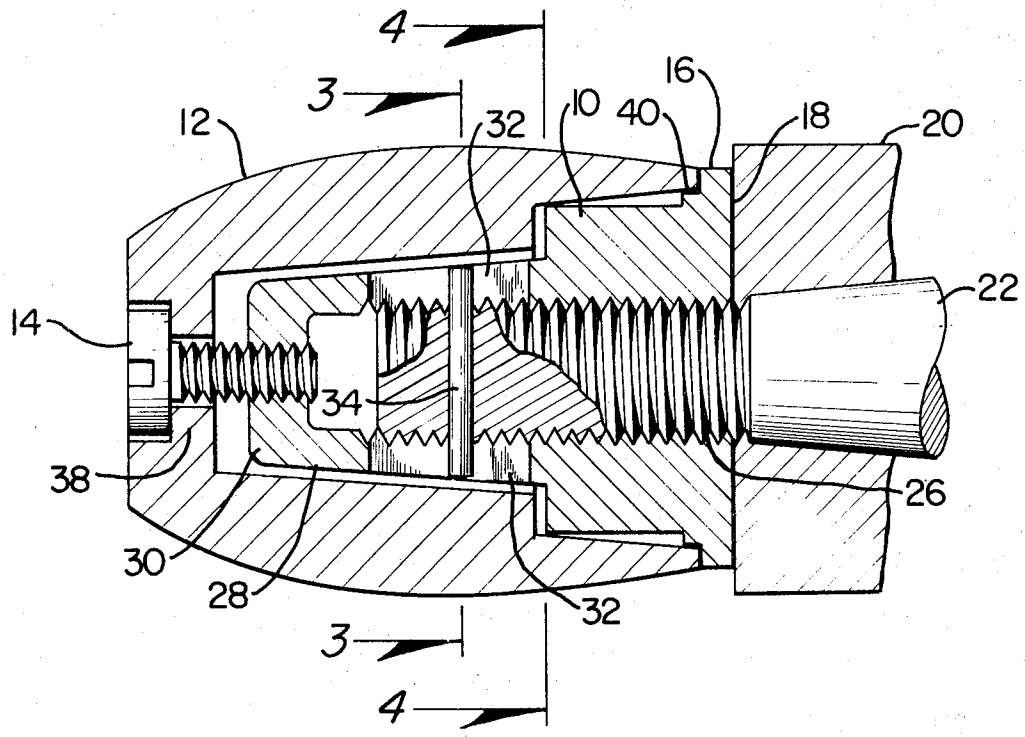
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Attorney, Agent, or Firm—Victor C. Muller

[57] **ABSTRACT**

Fairwater device for a boat propeller shaft characterized by a bronze nut with wrench flats thereon for securing a propeller to the shaft, a replaceable zinc member surrounding the nut, the wrench flats engaging like internal flats on the zinc member for driving same, and a single central screw engageable with a rear wall of the zinc member and a rear wall of the nut for securing the zinc member to the nut. The nut may also be provided, if desired, with a plurality of elongated angularly spaced and axially extending slots for receiving a locking pin extending through the propeller shaft. With the provision of six slots, angular positioning of the nut on the shaft may be controlled within 60° and the slots permit positioning the pin within a previously drilled diameterical hole in the shaft, regardless of its axial position therein, thus obviating the drilling of a new hole which could weaken the shaft.

5 Claims, 4 Drawing Figures



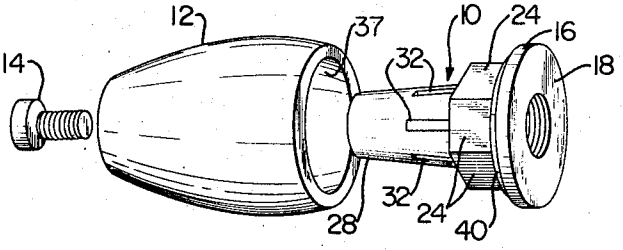


FIG. 1

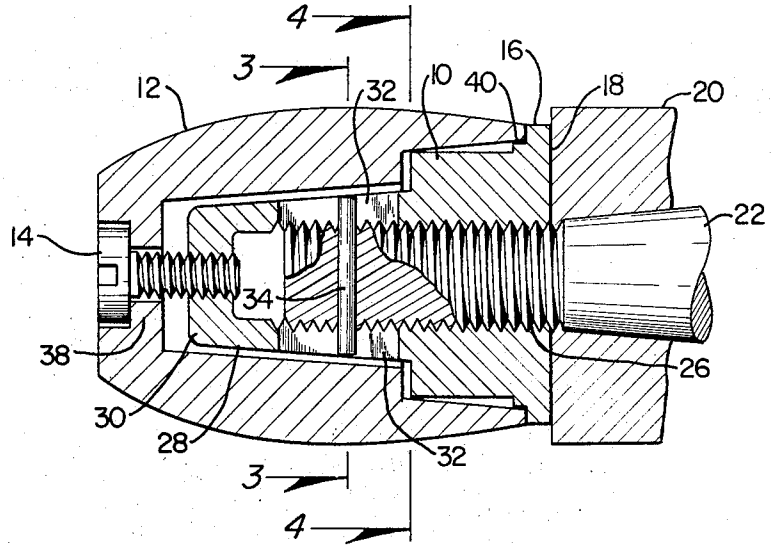


FIG. 2

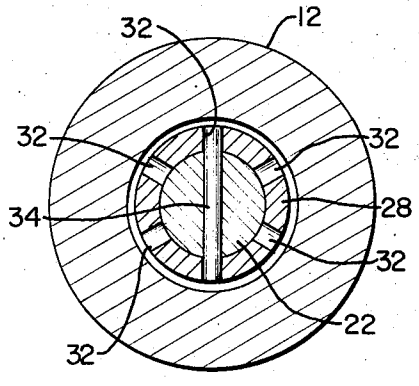


FIG. 3

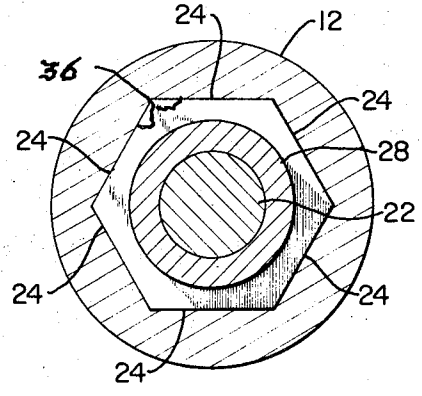


FIG. 4

PROPELLER NUT AND FAIRWATER

BACKGROUND OF THE INVENTION

As is well known, bronze marine propellers, rudders and other appurtenances are subjected to electrolytic corrosion or erosion particularly when other metals are present at the exterior of a boat hull. To minimize this, other metals have been employed which are subjected to the erosion thus minimizing the erosion of the members which it is desired to protect. Zinc in the form of plates or the like, attached to the boat hull, have long been used. At present it is conventional to attach a mass of zinc to a propeller shaft adjacent the propeller to protect the latter against the electrolytic erosion. U.S. Pat. No. 2,732,021 to Taft is exemplary of this type of device. In another well known form, identified as the PERRY nut a generally bullet shaped mass of zinc is employed which is cast about a bronze nut which threadedly engages the rear end of the propeller shaft and which abuts the propeller hub to retain the propeller on the shaft which is usually tapered and keyed to the propeller hub. When the device, often referred to as a fairwater, has eroded to a point where it is no longer useful, the assembly of bronze nut and integrally attached zinc is discarded and replaced with a new assembly. This is somewhat expensive for the boat owner, however, since the discarded bronze nut represents a substantial portion of the manufacturing cost of the unit.

In another conventional fairwater, known as the ESSEX nut, a bronze propeller shaft nut is provided which carries a threaded male stud to which the fairwater is threadedly affixed. When replacement is required, the zinc fairwater is unscrewed from the stud and a new fairwater attached thereto, thus discarding only the zinc mass and retaining the bronze nut for continued use. In this construction, the front face of the fairwater is spaced rearwardly from the rear face of the propeller hub, effecting considerable overhang or extension of the assembly.

SUMMARY OF THE INVENTION

The present invention is broadly like the Essex nut in that only the zinc mass requires replacement. Its orientation with respect to streamlining rearwardly of the propeller hub is similar to the Perry and Taft (FIG. 1) nuts. It differs generally from the Perry fairwater in that the zinc portion is detachably connected to the bronze nut which remains on the propeller shaft for further use. It differs generally from the Taft fairwater in that the entire mass of zinc is integrally cast and does not contain any bronze insert which must be discharded. Thus, in the Taft construction the bronze insert must be discharded along with its surrounding mass of zinc. It also differs from any of the fairwater devices referred to in the manner in which the zinc mass is secured to the bronze nut which it encases. Also, it is provided with internal flat portions which engage wrench flats on the bronze nut. The wrench flats on the bronze nut thus serve the dual purpose of applying the nut to the propeller shaft and also driving the zinc fairwater after it has been affixed to the bronze nut. Further differences will become apparent from the detailed description to follow, the appended claims, and the accompanying drawing to now be briefly described.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is an exploded view of the subject of the invention;

FIG. **2** is an enlarged longitudinal central section of FIG. **1**, illustrating the parts in assembled relationship and attached to a propeller shaft;

FIG. **3** is a section taken on line **3—3**, FIG. **2**; and

FIG. **4** is a section taken on line **4—4**, FIG. **2**.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to the drawing, and first to FIG. **1**, the subject of the invention comprises, briefly, a bronze nut **10**, a generally bullet shaped hollow zinc fairwater **12** for encasing the nut, and a screw **14** for securing the fairwater to the nut.

Referring now to FIGS. **2** to **4**, nut **10** is an integral bronze casting having a circular flange **16** at its front end, the front surface **18** of the nut abutting a propeller hub **20** which is carried by propeller shaft **22** which is usually frusto-conical and keyed to the hub. Just rearwardly of the flange the nut is hexagonal in shape, as best shown in FIGS. **1** and **4**, the flats **24** being adapted to receive a wrench for tightening the nut on the shaft which is provided with threads **26** engageable with like threads in the nut. Rearwardly of the hexagonal portion, portion **28** is frusto-conical, its rear end having a wall **30** which threadedly receives screw **14**. As best shown in FIGS. **1** to **3**, portion **28** is provided with six equiangularly spaced elongated slots **32** which extend through the wall thereof. In applying the nut to the shaft, a suitable wrench is engaged with flats **24** and face **18** is brought into tight engagement with the propeller hub. Assuming that the shaft has been previously drilled with a diametrical cotter pin hole **34**, one pair of the slots may be brought into registry with hole **34** by further tightening the nut somewhat less than 60°. The elongation of the slots permits registry irrespective of the axial position of hole **34**. Any further weakening of the shaft by drilling a new hole is thus obviated. In the event the shaft has not been previously drilled, the nut is applied in the same manner and the hole is drilled by a drill disposed in one of the slots.

Member **12** is hollow and loossly surrounds the nut. It is provided with six internal flats **36** which engage flats **24** on the nut. For ease of manufacture and assembly, flats **36** are provided with draft so that they gradually change from a hexagonal section, as shown in FIG. **4**, to a circular hole **37** at the right or front face of member **12**.

The left or rear end of member **12** is provided with an integral wall **38** which is provided with an axial counterbored recess for receiving screw **14**. A lock washer (not shown) is preferably disposed beneath the head of the screw to resist loosening thereof. When the fairwater is assembled on the nut, as best shown in FIG. **2**, circular machined surface **40** fits within circular bore **37**, concentrically aligning the fairwater and nut.

What is claimed is:

1. In a fairwater anode device adapted to threadedly engage the rear end of a propeller shaft and having a forward end face for engaging the rear face of a propller hub for retaining same on the propeller shaft, the improvements comprising;

a. said device comprising a nut having wrench flats disposed rearwardly of said forward end face

adapted to be engaged by a wrench for applying the nut to the shaft or removing same therefrom,

b. a hollow integral projection extending axially and rearwardly from said flats having a wall at the rear end thereof,

c. a removeable hollow anode having a circular outer surface, tapering inwardly toward its rear end to provide a fairwater exterior surface, surrounding said nut and having a front face disposed adjacent said forward end face of said nut,

d. said anode also having internal surfaces engaging said flats, whereby the flats drivingly engage same,

e. said anode further having a rear wall disposed rearwardly of the rear wall of the projection,

f. a threaded member, such as a screw, extending through a central aperture in the rear wall of the anode and cooperating with the rear wall of the projection for drawing said walls relatively toward each other,

g. the construction being such that the nut may be applied to the propeller shaft to secure the propeller hub thereto, after which the anode may be telescoped over the nut, and finally, the threaded member may be applied to secure the anode to the nut, the anode adapted to be removed and replaced without removing the nut, whereby only the anode is expendable.

2. A device in accordance with claim **1** wherein said extension is provided with a plurality of pairs of diametrically opposed elongated axially extending slots through which a cotter pin may be inserted to thereby align same with an existing cotter pin hole in the propeller shaft.

3. A device in accordance with claim **2** wherein the slots are disposed 60° apart.

4. A device in accordance with claim **1** wherein the front face of the nut is provided with a flange, the forward face of which engages the propeller hub, the rear face of which is engageable with the front face of the anode.

5. A device in accordance with claim **1** wherein the front face of the anode and front face of the nut are disposed in substantially the same plane.

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