

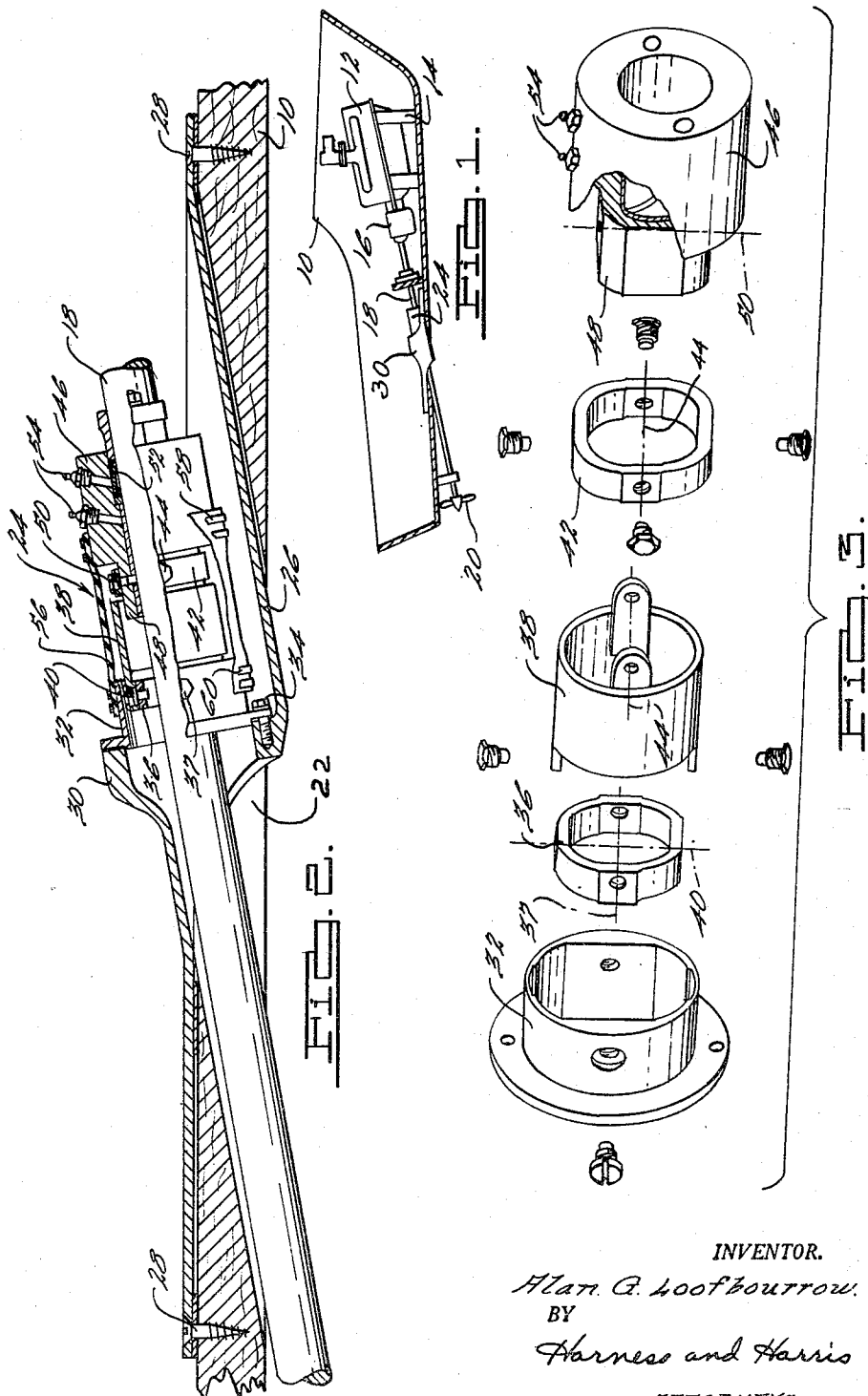
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STUFFING BOX FOR BOATS

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STUFFING BOX FOR BOATS

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This invention relates to an improved stuffing box for marine application and more particularly to an improved mounting for a propeller shaft bearing.

In motor boats of conventional construction an engine is usually mounted within a hull and an inclined drive shaft extends from the engine through the bottom of the hull and into the water and is provided with a propeller located on the outboard end thereof. Thrust from the propeller is transmitted through the propeller shaft to the hull. It is necessary to provide a watertight seal between the propeller shaft and the opening in the hull which is penetrated by the shaft and it has heretofore been common practice to provide a bearing which circumscribes the propeller shaft within the hull and to connect this bearing to the hull by a waterproof tube which circumscribes the shaft and is usually made of rubber or a similar flexible material. The bearing is usually provided with packing rings to prevent the admission of water between the shaft and the bearing and the waterproof tube prevents the entrance of water into the hull between the bearing and the hull. This construction contains an inherent disadvantage in that occasionally a bearing seizes on the shaft due to faulty lubrication and in the conventional construction when this occurs the bearing begins to rotate with the shaft and the rubber tube which is secured at one end to the bearing and at the other end to the hull is twisted and torn which in turn admits water to the hull of the boat and causes the latter to sink.

In my improved construction I provide a universal joint means for non-rotatably supporting the bearing on the hull. This permits the bearing to locate itself in any position demanded by the propeller shaft and yet prevents the bearing from rotating with the propeller shaft under any conditions. The flexible rubber tube which connects the bearing to the hull thus cannot be subjected to torsion and the boat will not sink under the conditions described in the preceding paragraph. In the event that faulty lubrication causes the bearing to seize on the propeller shaft all that can happen is that the bearing will be scored or burned out which are relatively minor damages as compared with the alternative of having the entire boat sink.

Referring to the drawings:

Fig. 1 is a diagrammatic view of a boat showing the relationship of the hull, engine and stuffing box;

Fig. 2 is an enlarged view partly in section of the assembled stuffing box; and

Fig. 3 is an exploded view in perspective of the components of the universal joint means used to support the propeller shaft bearing.

In Fig. 1 a motor boat is illustrated as comprising

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ing a hull 10, an engine 12 supported therein on engine supports 14 and a transmission case 16 from which a propeller shaft 18 carrying a propeller 20 extends. The propeller shaft penetrates the hull through an opening 22 and a stuffing box 24 is provided to seal this opening against the entrance of water.

Referring to Fig. 2 it will be seen that the opening in the hull is surrounded by a casting 26 which is secured to the hull by screws 28 and which is provided with an annular portion 30 having its axis aligned with the propeller shaft 18. Collar 32 surrounds the propeller shaft and is bolted to the annular portion 30 of the casting 26 by bolts 34. A ring 36 is rotatably carried by the collar 32 for rotation about a horizontal axis 37 and an intermediate member or yoke 38 is rotatably carried by the ring 36 and mounted for rotation about an axis 40 normal to the horizontal axis 37 of the ring 36. The yoke 38 carries a second ring 42 which is rotatably carried thereby for rotation about an axis 44 normal to the axis 40. A bearing 46 which circumscribes the propeller shaft 18 has an extended portion 48 which penetrates the ring 42 and is mounted for rotation relative thereto about an axis 50 which is normal to the axis 44. The bearing 46 carries the usual packing rings 52 which effect a fluid seal with the propeller shaft 18 and the usual lubrication fittings 54.

The double universal joint structure thus described provides a means for bearing 46 to assume any position assumed by the propeller shaft 18 as an incident to vibration or movement thereof relative to the hull. It should be noted however, that although the bearing 46 is mounted for universal movement that the mounting mechanically prevents rotation of the bearing relative to the hull. A rubber hose 56 which circumscribes the universal joint means and has one end thereof securely fastened to the bearing 46 by a hose clamp 58 and the other end thereof securely fastened to the collar 32 by a hose clamp 60 prevents the admission of water to the interior of the hull. The flexibility of the hose 56 accommodates the above described universal motion of bearing 46 and the novel universal mounting means for the bearing 46 assures that torsional stress will never be imposed on the hose 56 such that the latter might be ruptured and the boat sunk.

I claim:

1. A sealing unit for the propeller shaft of a motor boat having a hull with an opening through which said shaft extends, said unit including a first element surrounding said opening and carried by said hull in fluid sealing relationship thereto, a second element surrounding said shaft and carried in fluid sealing relationship thereto, means operable to prevent relative rotation be-

tween said elements and a waterproof covering material sealed around said first element and said second element and extending therebetween.

2. A sealing unit operable to effect a fluidtight seal around a propeller shaft which penetrates an opening provided therefor in the hull of a motor boat, said unit including an element adapted to surround said opening and to be secured in sealing relationship to said hull, a bearing adapted to surround said shaft in fluid sealing relationship thereto, universal joint means mechanically connecting said bearing and said element and operable to accommodate universal movement of said bearing relative to said element and to prevent relative rotation between said bearing and said element and a flexible watertight cover circumscribing said universal joint means and secured to said element and said bearing to prevent the admission of water to the interior of said hull.

3. A sealing unit operable to effect a fluidtight seal around a propeller shaft which penetrates an opening provided therefor in the hull of a motor boat, said unit including an element adapted to surround said opening and to be secured in sealing relationship to said hull, a bearing having packing material therein and adapted to surround said shaft in fluid sealing relationship thereto, connecting means associated with said element and said bearing and operable to non-rotatably but flexibly support said bearing on said hull so as to accommodate a universal movement of said shaft and a tubular hose connecting said bearing and said element and circumscribing said shaft to prevent the admission of water to the interior of said hull.

4. A sealing unit operable to effect a fluidtight seal around a propeller shaft which penetrates an opening provided therefor in the hull of a motor boat, said unit including an element adapted to surround said opening and to be secured in sealing relationship to said hull, a bearing having packing material therein and adapted to surround said shaft in fluid sealing relationship thereto, connecting means associated with said element and said bearing and operable to non-rotatably but flexibly support said bearing on said hull so as to accommodate a universal movement of said shaft, said connecting means including a first member carried by said element and mounted for rotation about a first axis, a second member carried by said first member and mounted for rotation about a second axis normal to said first axis, a third member carried by said second member and mounted for rotation about a third axis normal to said second axis and adapted to support said bearing for rotation about a fourth axis normal to said third axis and a tubular hose connecting said bearing and said element and circumscribing said shaft to prevent the admission of water to the interior of said hull.

5. A sealing unit operable to effect a fluidtight seal around a propeller shaft which penetrates an opening provided therefor in the hull of a motor boat, said unit including a collar adapted to surround said shaft and to be secured in sealing relationship to said hull, a bearing having packing material therein and adapted to surround said shaft in fluid sealing relationship thereto, connecting means associated with said element and said bearing and operable to non-

rotatably but flexibly support said bearing on said hull so as to accommodate a universal movement of said shaft, said connecting means including a first ring carried within said collar and mounted for rotation about a first axis, a yoke carried by said first ring and mounted for rotation relative thereto about a second axis normal to said first axis, a second ring carried by said yoke and mounted for rotation about a third axis normal to said second axis and adapted to support said bearing for rotation about a fourth axis normal to said third axis and a tubular hose connecting said bearing and said element and circumscribing said shaft to prevent the admission of water to the interior of said hull.

6. A sealing unit operable to effect a fluidtight seal around a propeller shaft which penetrates an opening provided therefor in the hull of a motor boat, said unit including an element surrounding said opening and secured in fluid sealing relationship to said hull, a bearing circumscribing said shaft in fluid sealing relationship thereto, universal joint means mechanically connecting said bearing and said element and comprising a member located intermediate said element and said bearing and mechanically connected to said element and said bearing for pivotal movement relative to said element and said bearing, said universal joint means being operable to accommodate universal movement of said bearing relative to said element and to prevent relative rotation between said bearing and said element while the mechanical connection between said element, said member and said bearing prevents both longitudinal and lateral displacement of said bearing relative to said element, and a flexible watertight cover circumscribing said universal joint means and secured to said element and said bearing to prevent the admission of water to the interior of said hull.

7. A sealing unit operable to effect a fluidtight seal around a propeller shaft which penetrates an opening provided therefor in the hull of a motor boat, said unit including an element surrounding said opening and secured in fluid sealing relationship to said hull, a bearing circumscribing said shaft in fluid sealing relationship thereto, an intermediate member mounted on said bearing for rotation about a first axis and mounted on said element for rotation about a second axis at right angles to the first axis to accommodate universal movement of said bearing relative to said element and to provide a mechanical connection between said element and said bearing to prevent longitudinal displacement of said bearing relative to said element, and a flexible watertight cover circumscribing said universal joint means and secured to said element and said bearing to prevent the admission of water to the interior of said hull.

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