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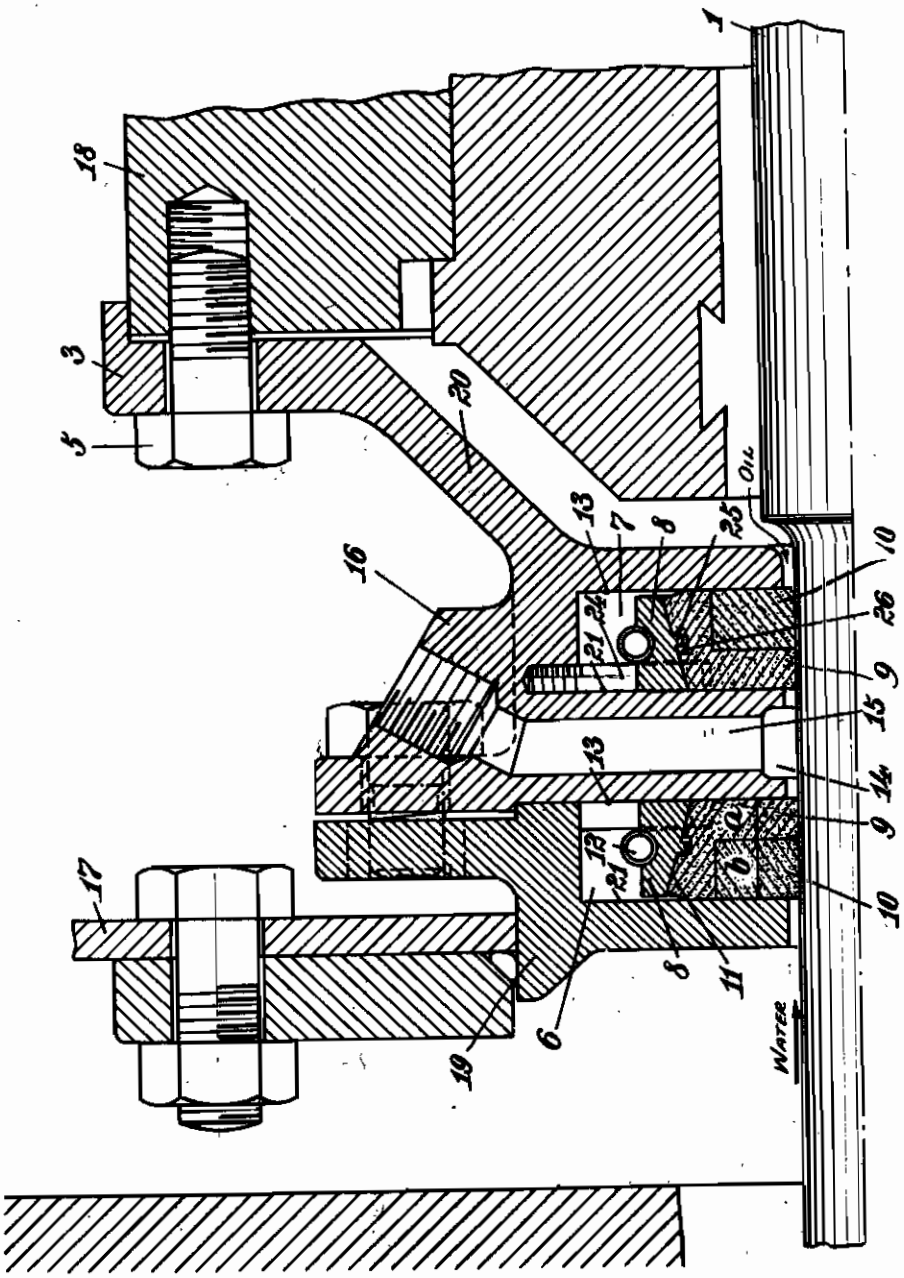

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PACKING FOR VESSEL PROPELLER SHAFTS

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The present invention relates to new and useful improvements in packing for vessel propeller shafts. It is an object of this invention to provide a packing adapted to be advantageously used with supporting bearings, auxiliary thrust bearings, bulkhead stuffing-boxes, shaft couplings, and stuffing boxes of stern tubes.

Up to the present time such parts of vessel propeller shaft systems were packed against oil by means of felt rings and against water by means of cotton cords. However such packing proved to be extremely detrimental to the shaft, owing to said latter being so strongly injured by the felt rings and/or cotton cords that after a certain period of service comparatively deep annular groves are worn out in such shaft. Hereby the moment of resistance of the shaft is materially diminished, bringing about an immediate decrease of the security of the complete engine and vessel unit, what is due to the fact that the vessel propeller shaft represents a vital element of said entire unit. Moreover, the propeller shaft diameter of merchant-ships is exactly prescribed by classification companies, such e. g. as The German Lloyd or The Lloyd's Register, so that the portion of the propeller shaft system having its shaft worn out to a certain degree by felt rings or cotton cords must be replaced under any circumstances.

It is an object of the present invention to remove these drawbacks by providing a stuffing-box arrangement for vessel propeller shafts wherein composite coal rings are used, having their individual segments held together by means of a spring or springs. Such coal ring is preferably arranged in a chamber together with a metal ring encircling and compressing said coal ring. The pressure ring is also formed of several parts and it has an inner conical surface adapted to bear from the outside on a corresponding cone-shaped surface of the coal ring segments, so that they are pressed by the action of said spring or springs towards a radial wall of the chamber. It is often recommendable to arrange the cone-shaped surfaces of said coal ring and of said pressure ring or—if a number of rings are present—at least the cone-shaped surface of one of the coal rings and of the corresponding pressure ring so that the spring or springs will urge said composite coal ring towards that chamber wall towards which it is pressed by the liquid that it is desired to prevent from leaking. In this way the coal ring segments stick by adhesion to a chamber wall, so that an inadmissible overloading of the shaft due to the weight of said coal ring, of its pressure ring and spring is excluded.

For the purpose of facilitating the introduction and assembling of the filling parts into said chamber the inner surface of the pressure ring is preferably formed with an annular projection or rib adapted to enter with lost motion into a correspondingly shaped circular groove or channel provided in the outer peripheral surface of the coal ring.

In accordance with a further improvement of this stuffing-box arrangement, any individual stuffing-box comprises two composite coal rings having between them an annular space communicating by means of a feed duct with an automatically adjusted Stauffer lubricator box. If a water-tight joint has to be obtained, the annular space and the lubricator box should be filled up with grease, whilst for an oil-tight joint they should be filled up with a lubricating paste representing a mixture of soft soap and an appropriate kind of graphite.

With the above and other objects in view, reference is had to the accompanying drawing illustrating an exemplary embodiment of this stuffing-box arrangement.

In the drawing the propeller shaft of a vessel is denoted by reference character 1. It is mounted in a bearing having a body member 18 and it passes through a water-tight wall or bulkhead 17. Said body member 18 has attached thereto on its outer peripheral edge by means of bolts 5 a two-part casing 20. The dash and dotted lines indicate means by which both parts of said casing are united to one another. Said two-part casing has connected thereto as shown in a radial plane a further casing 19 being also divided in axial direction.

The casing 20 comprises an annular chamber 7 and also forms together with casing 19 an annular chamber 6. In each of said chambers there are inserted a metal ring 8 and a composite coal ring 9, 10. The coal ring 9 has a known L-shaped profile having fitted between its links a further coal ring 10. The dimension *a* is smaller than the dimension *b*. In this way any deformation of the composite coal ring is prevented in a manner known per se. Both of the coal rings 9, 10 are divided into an equal number of segments and they are firmly attached to one another, both of said rings being preferably arranged so that their individual segments are respectively overlapping one another in peripheral direction.

The metal ring 9 is also formed of a number

of segments. It bears on the outer side of the L-shaped ring 9 of the composite coal ring 9, 10 its cone-shaped surface 11 being applied to a correspondingly tapering surface of said L-shaped ring 9. The individual segments of the metal ring 8 and of the composite coal ring 9, 10 are held together by means of a coiled spring 12 whereby said composite coal ring is pressed towards the surface 21 or 13 of the chambers 6 and 7 respectively.

An annular space 14 is provided in the two-part casing 20 between both chambers 6 and 7, said space communicating by means of a feed duct 15 with a projecting nipple 16 adapted to accommodate a Stauffer lubricator box.

In the exemplary embodiment represented on the drawing a water-tight joint has to be provided to the left of casing 19 and an oil-tight joint to the right of casing 20. In such case the annular space 14 has to be filled up by means of a Stauffer lubricator box, not shown in the drawing, with a lubricating paste representing a mixture of soft soap and an appropriate kind of graphite. Such lubricating paste is also well adapted to provide for an oil-tight joint only. If a water-tight joint only has to be provided, the annular space 14 has to be filled with grease.

The tapering surfaces of the coal rings and of the pressure rings are arranged in such way that the composite coal ring situated in chamber 6 is pressed towards the surface 21 and the composite coal ring of chamber 7 towards the surface 13.

The pressure rings 8 have annular projections or ribs 25 engaging with lost motion in corresponding grooves or channels 26 of the composite coal rings 9, 10. In this way the introduction and assembling of the filling parts of the chambers is facilitated. In order to prevent a rotary motion of said filling parts there are provided radial stop pins 24.

Both the casings and the pressure rings may be profitably made of a light metal alloy not affected by salt water, such as e. g. silumin. However, they may be also made of any other metal not affected by salt water.

FELIX ANTONIUS HUHN.