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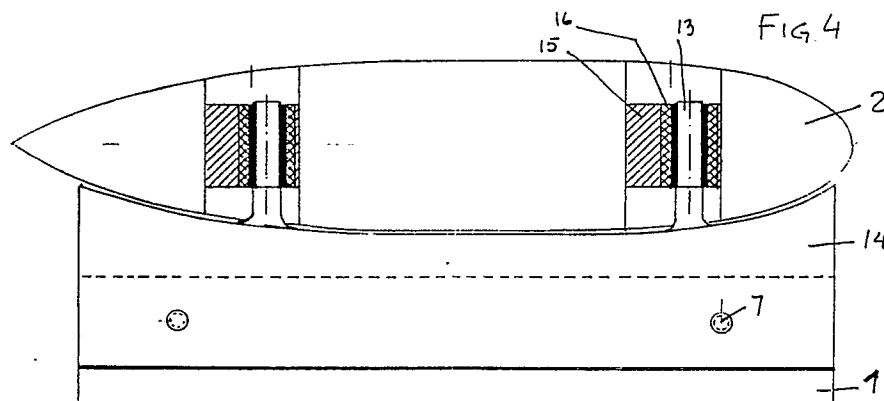
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Attachment means for a hydrofoil or the like.

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Attachment means for a hydrofoil or similar lifting panel (1) extending transversely below a vessel being provided with propulsion components including the propeller suspended below the vessel by means of supporting columns (2) the hydrofoils being attached at or near each lateral edge thereof to one of the supporting columns. The hydrofoil (1) is attached to or carried by the supporting columns (2) by means of pins (3, 13) being resiliently journalled in a socket (5) or in a rotatable element (15) in the supporting columns. The pins (3, 13) are attached to or journalled in gussets (4, 14) which are connected to the hydrofoil proper by means of break-away pins (7) to prevent total destruction of the hydrofoil in the case of a collision with some obstruction.



EP 0 383 547 A1

ATTACHMENT MEANS FOR A HYDROFOIL OR THE LIKE

The present invention relates to an attachment means for a hydrofoil or similar lifting panel of a vessel, which shall hereinafter be referred to as a hydrofoil vessel, propulsion components, including the propeller and associated parts, being suspended below the vessel by means of supporting columns extending downwards from the hull of the vessel, the hydrofoils extending transversely of the vessel below the same and being attached at or near the lateral edges thereof to the supporting columns.

Such hydrofoil means have previously been rigidly attached to the supporting columns or other downwardly extending part of the hull of the vessel, e.g. by welding or riveting. However, such rigid connection subjects the supporting columns to deformation stresses which may be unacceptably large and can lead to destruction of the propulsive drive means when such means pass through the supporting columns to the propulsion components.

The purpose of this invention is to overcome this disadvantage, and this is achieved by attaching the foil to the supporting columns by means of pins disposed such as defined in the claims. In order to reduce the risk of total breakdown as a result of a collision between the hydrofoil and some hindrance in or below the water surface, it is proposed that the pins are attached to gussets or the like which are in turn attached to the hydrofoil by means of break-away pins.

The invention will now be specifically described with reference to the attached drawings showing illustrative embodiments of the invention, certain details being omitted from the drawings for the sake of clarity.

Figs. 1 and 2 show a side view and a plan view, respectively, partly in section and partly in segment, of one embodiment of the invention.

Figs. 3 and 4 show views corresponding to those in Figs. 1 and 2, of another embodiment of the invention.

Fig. 5 shows an end view of the part of a break-down preventing arrangement for use in connection with the invention.

The invention concerns an attachment arrangement for a hydrofoil or similar supporting wing means 1 of a vessel which for the sake of simplicity shall be referred to as a hydrofoil vessel. This vessel is provided with propulsion components suspended below the vessel by means of supporting columns 2, and the hydrofoil 1 extends transversely of the vessel below the same and is attached at or near its lateral edges to the said supporting columns 2 by means of pins 3 or 13.

In the embodiment of Figs. 1 and 2 the pins 3

extend parallel to the lengthwise direction of the vessel and are disposed at the leading and trailing portion of the respective supporting columns 2. Only the leading portion arrangement of the pin is shown in Figs. 1 and 2, but it will be evident that the arrangement at the trailing portion will be similar to that at the leading portion. The pins 3 are introduced from the leading edge (and from the trailing edge) of the hydrofoil or of end pieces 4 thereof, and into sockets 5 carrying a sleeve or lining 6 of rubber or similar resilient material. By this manner of attachment, the pins 3 will act as pivot pins for the hydrofoil so that the latter will not subject the supporting columns 2 to substantial bending stresses when being bent up and down during the movement through the sea. Such bending stresses in the supporting columns could lead to the destruction of the propulsive drive means which pass through the supporting columns from propulsion drive engine within the vessel to the propulsion components.

In the embodiment of Figs. 3 and 4 the pins 13 extend at right angles to the lengthwise direction of the vessel. The pins 13 are rigidly attached to the hydrofoil 1 or to end pieces 14 thereof and are journaled eccentrically in sleeves 15 in trough bores in the supporting column 2, a cylindric lining 16 of rubber or similar resilient material being provided between the pin 13 and the sleeve 15. The purpose of the lining 16 is to accommodate such "tilting movements" which occur due to the hydrofoil being bent up and down during the movement of the vessel through the sea, and the lining thus acts as a kind of a hinge means. By journaling the pins 13 eccentrically in the sleeves 15 the angle of attack of the hydrofoil 1 may be adjusted. Such adjustment is intended to be effected in general only once, e.g. after pre-delivery trials, but may also be effected at some later time if required. Instead of being journaled in sleeves the pins may be eccentrically journaled in balls which in themselves may permit a certain tilting movement of the pins, thereby accommodating the otherwise destructive tilting movements of the hydrofoil with respect to the supporting columns.

In order to prevent or reduce the risk of total break-down as a result of a collision between hydrofoil and some hindrance in or below the water surface it is suggested, as indicated in Figs. 2 and 4 that the hydrofoil proper is terminated at both lateral edges with end portions or gusset portions 4 (Fig. 2) or 14 (Fig. 4) which are attached to the hydrofoil proper by means of break-away pins 7.

Claims

1. Attachment means for a hydrofoil (1) or the like extending transversely below a vessel and being attached at or near each lateral edge of the foil to a supporting column (2) for vessel propulsion components, characterized in that the foil (1) is attached to the supporting columns (2) by means of pins (3, 13) disposed near or in the front edge and rear edge of the foil (1).

2. Attachment means according to claim 1, characterized in that the pins (3) extend parallel to the lengthwise direction of the vessel, and are disposed at the front edge and rear edge of the respective supporting columns (2).

3. Attachment means according to claim 1, characterized in that the pins (13) extend transversely of the lengthwise direction of the vessel, within the front and rear edges of the foil (1).

4. Attachment means according to claims 1 to 3, characterized in that the pins (3, 13) are resiliently journalled in the supporting columns.

5. Attachment means according to claim 4, characterized in that each pin (13) is eccentrically journalled in a sleeve (15) or in a ball, for adjustment of the angle of incidence of the foil.

6. Attachment means according to claims 1 to 5, characterized in that each pin is journalled in a liner (6, 16) of rubber or similar resilient material.

7. Attachment means according to claims 1 to 6, characterized in that each pin (3, 13) is carried by or attached to a gusset (4, 14) which is in turn attached to the foil by means of one or more break-away pins (7).

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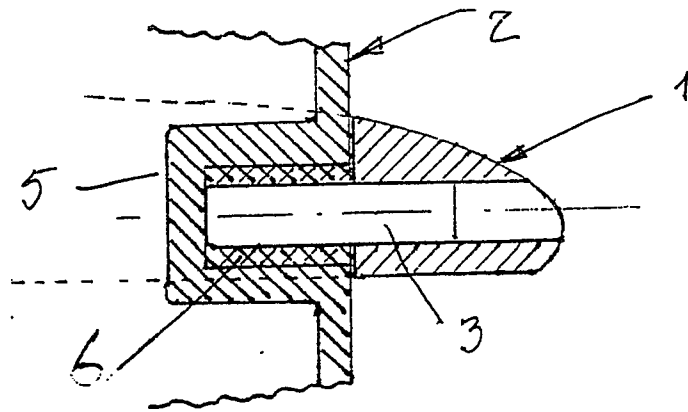


FIG. 1

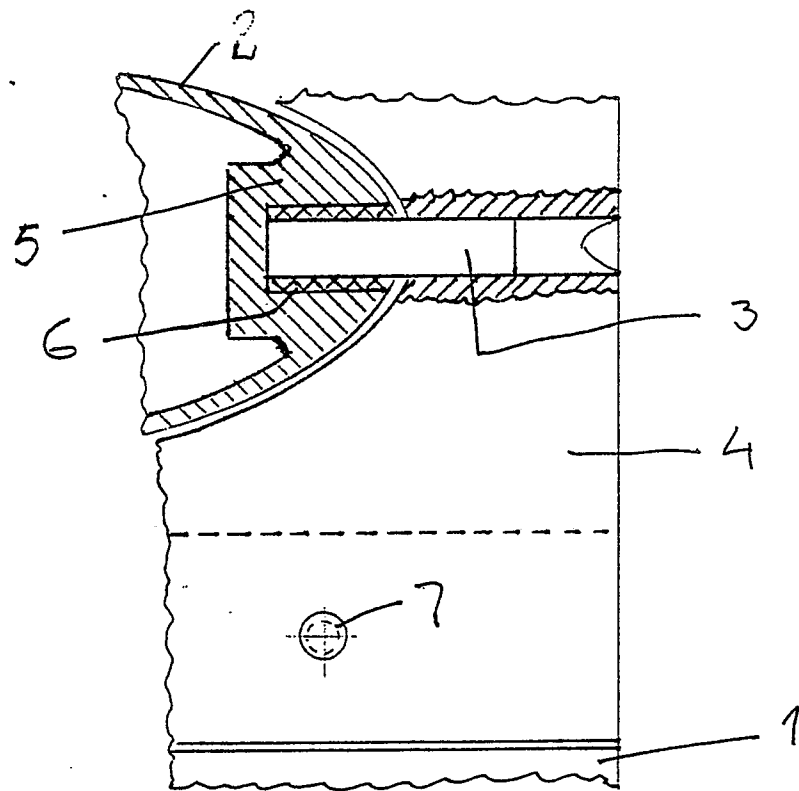


FIG. 2

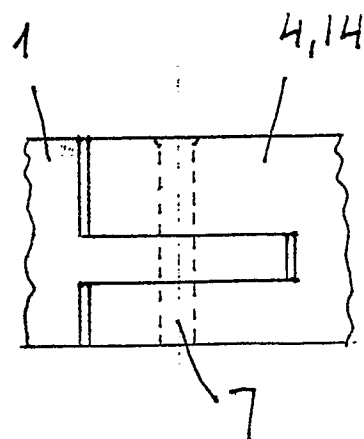
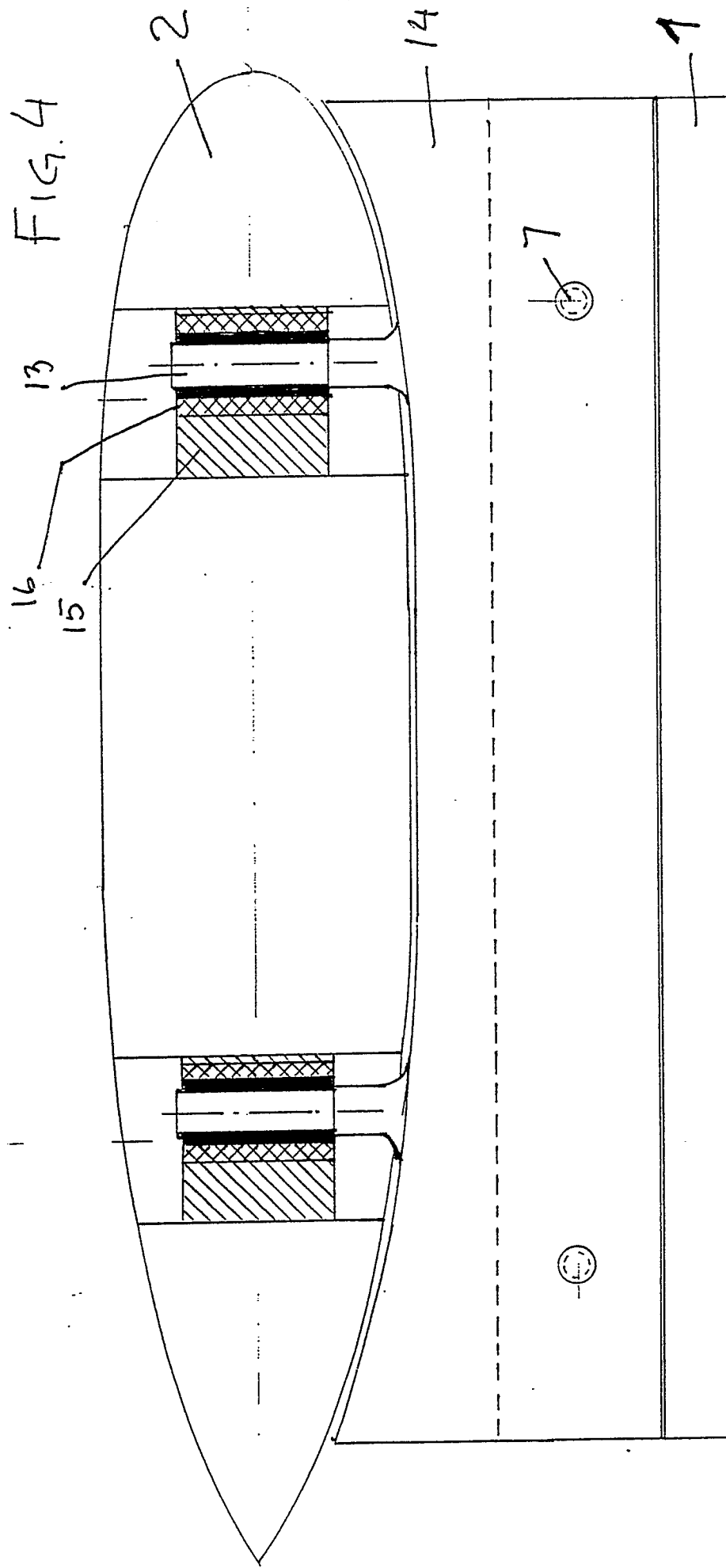
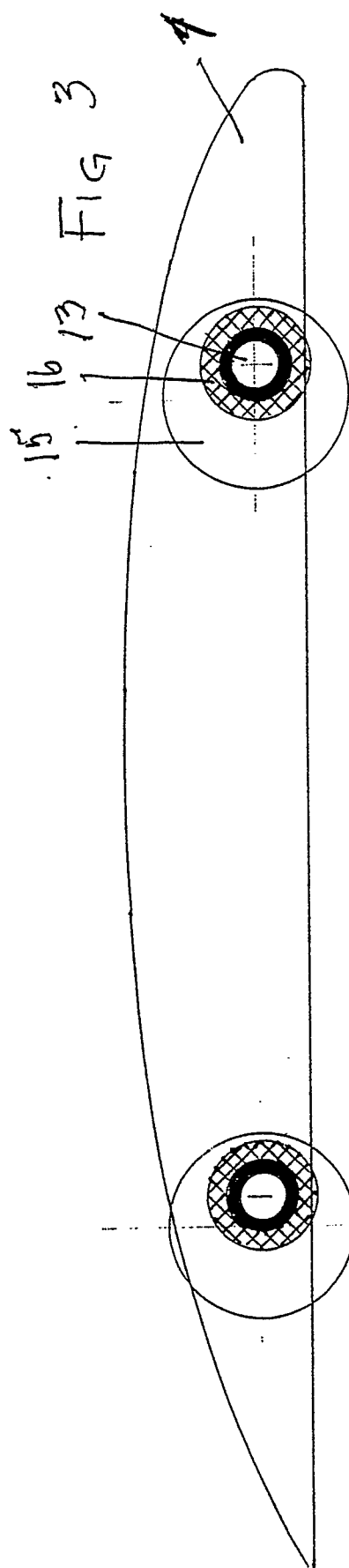


FIG. 5





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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 1524

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-3 635 035 (GREER) * Figures 1-5 * ---	1	B 63 B 1/24
A	DE-B-1 172 566 (PESCHKES) * Figure 1 * ---	1,3	
A	GB-A-2 091 646 (EUROVINIL IND.) * Page 3, lines 72-93; figures 3,5 * ---	1,3	
A	US-A-3 342 155 (HOOK) * Column 3, lines 67-69 * -----	7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 63 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10-05-1990	Examiner DE SCHEPPER H.P.H.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			