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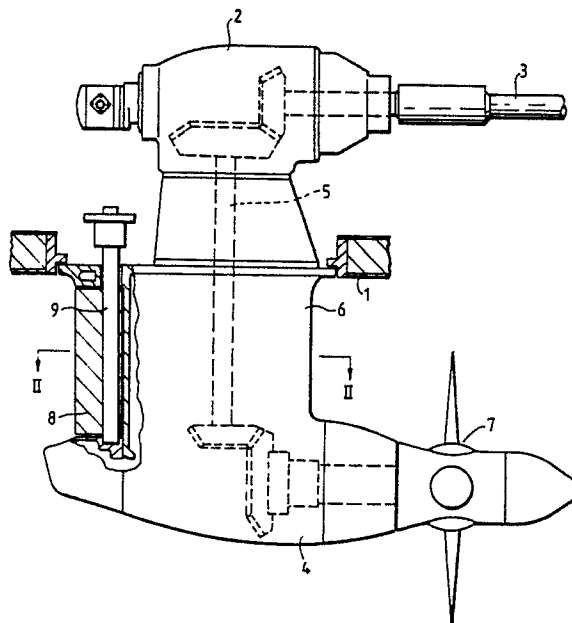
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Page White & Farrer 5 Plough Place New
Fetter Lane
London EC4A 1HY(GB)(54) **Propulsion system for vessels.**

(57) A propulsion system for high speed vessels, comprising a propeller (7) mounted with horizontal axis on a column (6) extending downwards from the bottom of the vessel. The propeller (7), which may be a variable pitch propeller, is disposed in a pulling relationship to the column, and the propeller and the column are mounted unturnably with respect to the vessel. The column is provided with steering means, in the form of a fin (8), for steering the vessel.

Fig. 1.



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PROPULSION SYSTEM FOR VESSELS

The present invention relates to a propulsion system for vessels, comprising a propeller mounted with horizontal axis on a column which extends down from the hull of the vessel, the said column enclosing a shaft for the transfer of power from a power source within the vessel to the propeller shaft.

Propulsion systems of this kind have previously been suggested, e.g. in the form of inboard-outboard arrangements and as so-called azimuth thrusters, where the propeller with its propeller shaft and the appurtenant column, for steering of the vessel, are turnable about a vertical axis. These previously known systems are, however, unsuitable for high speed vessels, inter alia based on the requirements set with regard to weight, efficiency and complexity.

In order to provide a propulsion system adapted to these requirements, it is suggested according to this invention that the propulsion system shall comprise a propeller mounted in front of the propeller shaft hub, i.e. pulling, and unturnable with respect to the column and with respect to the hull of the vessel, the column to be provided with one or more steering fins or the like for steering the vessel. Further features of the invention appear from the claims and the description below.

The invention is described in more detail with reference to the accompanying drawings, in which

Fig. 1 is a side view of a propulsion system according to the present invention,

Fig. 2 is a horizontal section through the column of Fig. 1, along the line II-II in Fig. 1, and

Fig. 3 shows two diagrams of the pressure difference on the two faces of the column, with the steering fin in neutral position and in swung-out position, respectively.

In Fig. 1, reference 1 denotes the bottom of a high-speed vessel, provided with a propulsion system according to this invention. The propulsion system comprises an upper bevel gearing mounted in a housing 2 and connected to a motor, not shown, through a shaft 3 and to a lower bevel gearing in a housing 4 through a shaft 5 extending through a column 6. The lower bevel gearing is in turn connected to a propeller 7, which may be a variable pitch propeller known per se.

The propeller 7 is mounted in a pulling relationship to the column 6, and the assembly consisting of propeller 7, lower gear housing 4 and column 6 is mounted unturnably with respect to the vessel below the bottom thereof.

For steering of the vessel the column 6 is provided with steering means in the form of fin 8 disposed at the trailing part of the column for

turning about a vertical axis, 9. As will appear from the horizontal section through the column, see Fig. 2, the fin is shaped as part of the column cross section, which in this embodiment is drop-shaped. It lies within the scope of the invention to dispose the steering fin on the leading part of the column, or even both at the leading and at the trailing part of the column. If desired, the fin may be divided along its height, e.g. so that the column and a lower fin part extend below the lower gear housing 4.

The effect of a propulsion and steering arrangement according to the invention is shown in Fig. 3, Fig. 3A showing the pressure outline on the two sides of the column when the steering fin 8 is in neutral position, i.e. with zero deflection, and it appears that the pressure is equal on both sides of the column. Fig. 3B does also show the pressure outline on both sides of the column, this time with a small steering fin deflection, and it appears that there is a pressure difference over the entire column including the steering fin even though the steering fin is but a major proportion of the column surface.

Claims

1. A propulsion system for a vessel, comprising a propeller (7) mounted with horizontal axis on a column (6) extending downwardly from the bottom of the vessel, the column enclosing a shaft (5) for the transfer of propelling powers from a power source within the vessel to the propeller, characterized in that the propeller (7) is mounted in front of the propeller shaft hub (4), and unturnable with respect to the column (6) and the hull of the vessel, and that the column (6) is provided with one or more steering fins or the like (8) for steering the vessel.

2. A propulsion system as claimed in claim 1, characterized in that the steering fin (8), being adapted to turn on a vertical axis with respect to the column per se, is mounted at the trailing part of the column, seen in the direction of movement of the vessel.

3. A propulsion system as claimed in claim 1, characterized in that the steering fin, being adapted to turn on a vertical axis with respect to the column per se, is mounted at the leading part of the column, seen in the direction of movement of the vessel.

4. A propulsion system as claimed in claim 1, characterized in that the steering fins, being each adapted to turn on a vertical axis with respect to

the column per se, are mounted at both the trailing and the leading part of the column, seen in the direction of movement of the vessel.

5. A propulsion system as claimed in claim 2, claim 3, or claim 4, characterized in that the steering fin or fins is or are divided in two or more sections along its height. 5

6. A propulsion system as claimed in any of claims 1 to 5, characterized in that the column and the steering fin or fins extend downwardly beyond the propeller area. 10

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Fig. 1.

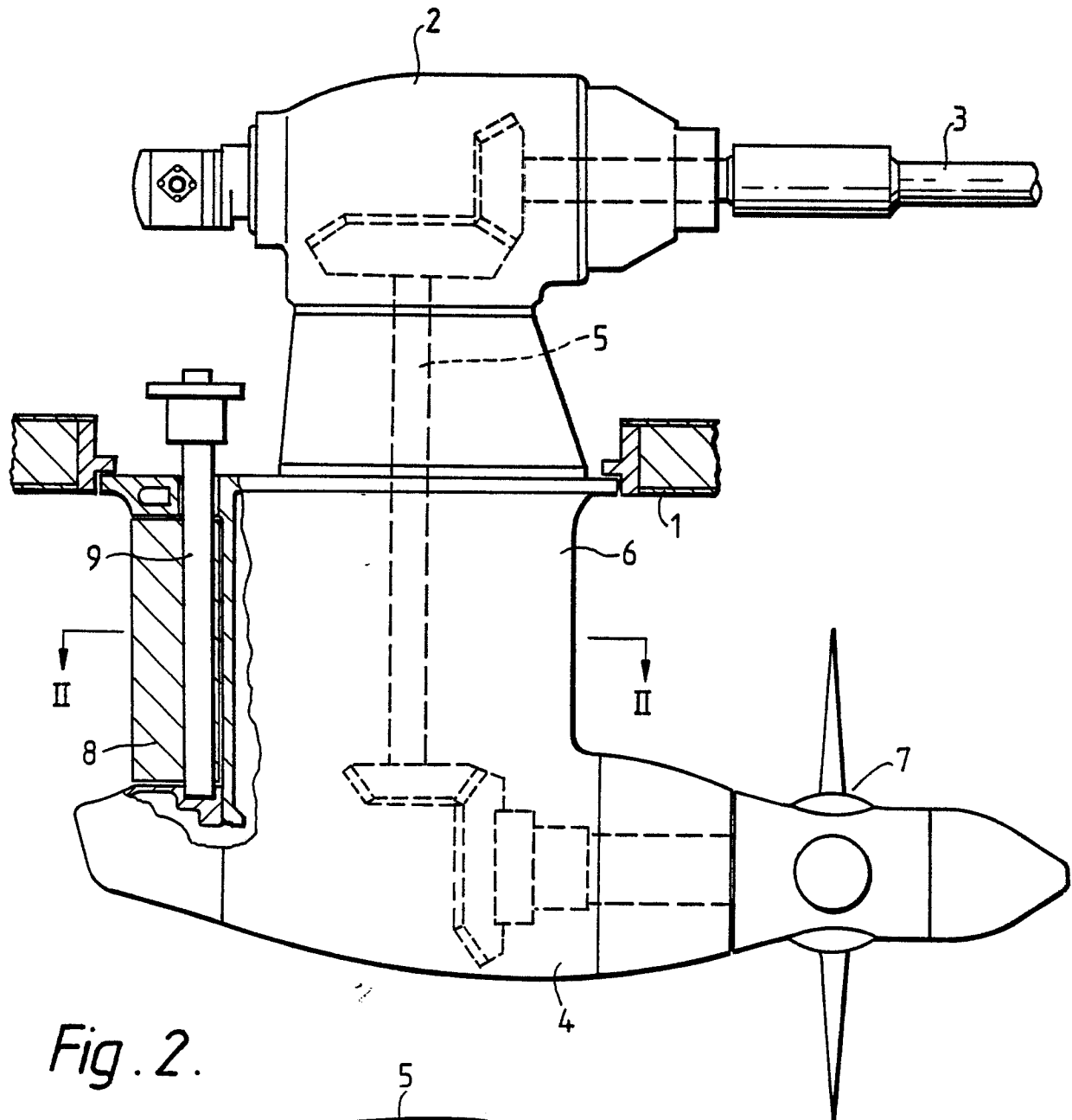


Fig. 2.

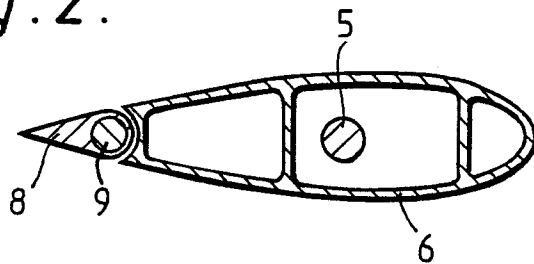


Fig. 3b.

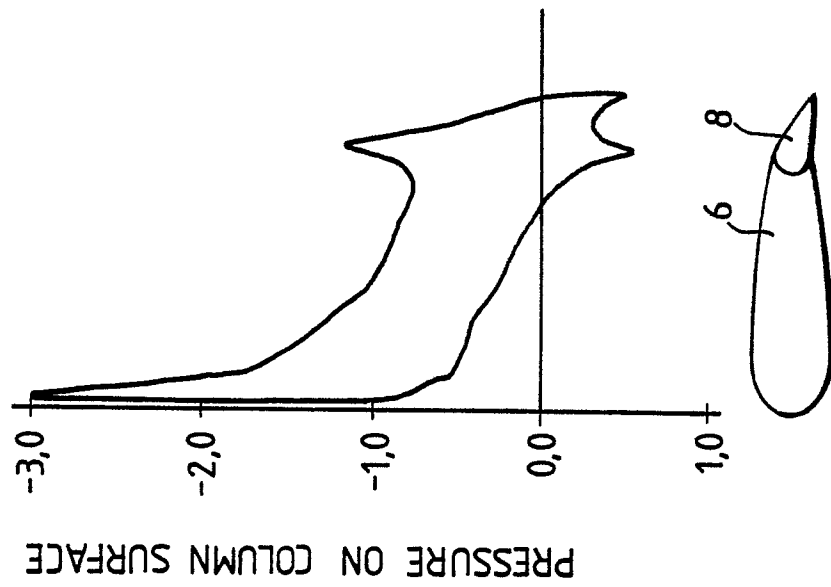
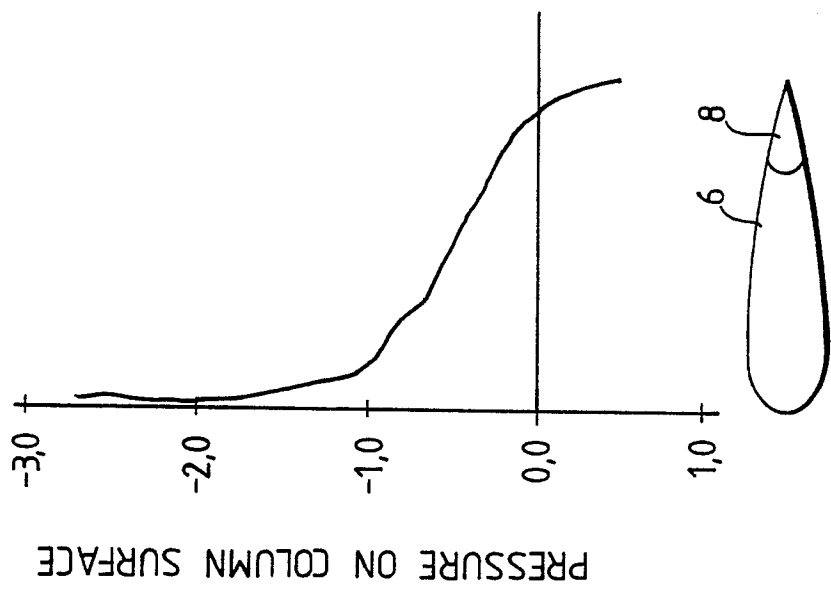


Fig. 3a.





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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. 4)
X	US-A-3 584 593 (L. BLOUNT) * Column 2, lines 15-33; figure 3 * ---	1,2,6	B 63 H 5/06 B 63 H 5/13
A	DE-A-3 519 103 (G. LICHTENAUER) * Page 1; pages 5,6; figures 1,2,3 * ---	1	
A	US-A-1 765 789 (H. DITCHBURN) * Page 1, lines 71-87; figure 1 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			B 63 H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11-02-1988	Examiner VISENTIN, M.
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			