May 15, 1951 E. O. HURST 2,553,372

SAILBOAT WITH PIVOTED CENTER FIN

Filed Dec. 12, 1947

FIG. 1

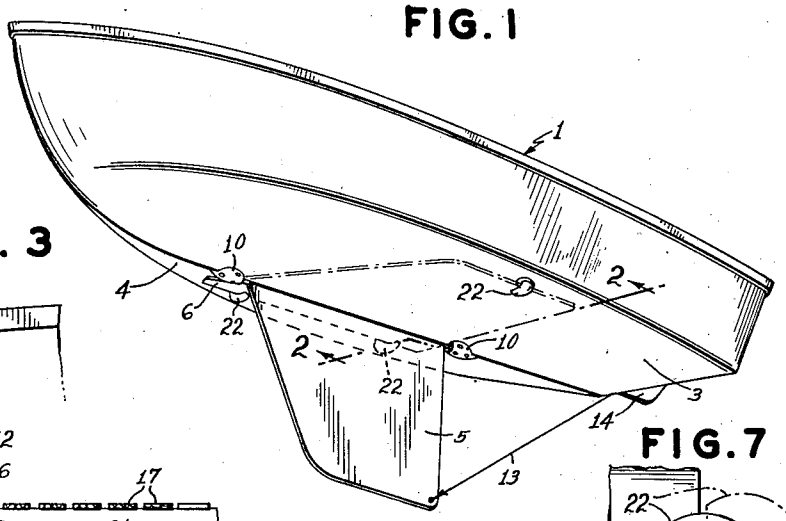


FIG. 3

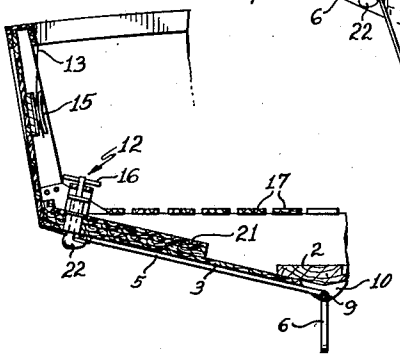


FIG. 7

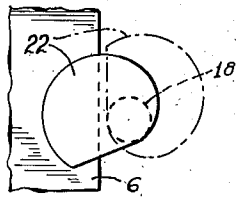


FIG. 8

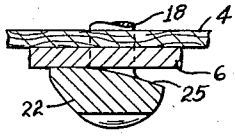


FIG. 2

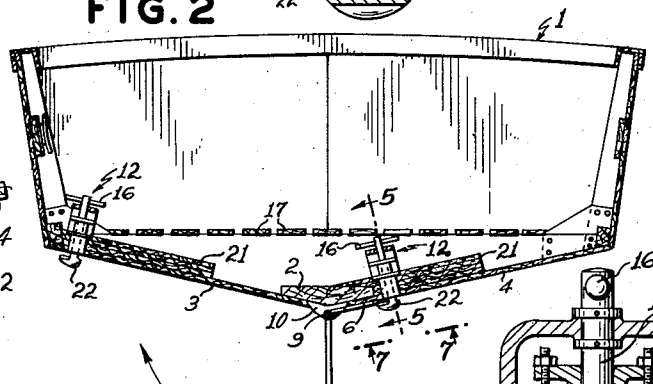


FIG. 6

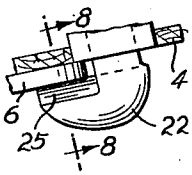


FIG. 5

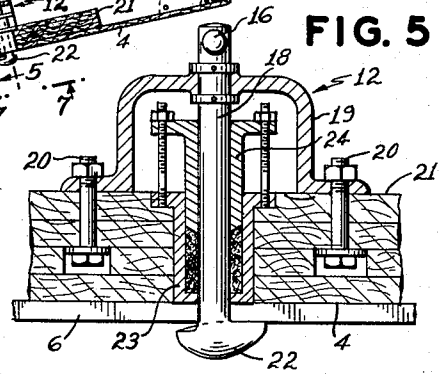
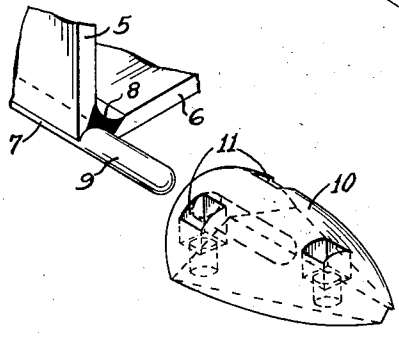


FIG. 4



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SAILBOAT WITH PIVOTED CENTER FIN

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3 Claims. (Cl. 114—143)

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This invention relates to boats and especially to sailboats with pivoted center fin, the general object of the invention being to provide an improved construction of leeway control device for such boats.

According to the usual practice in constructing sailboats a centerboard is employed to control leeway, and this is mounted in a narrow casing or box which projects upwardly from the interior of the bottom of the boat. This box is built over a slot in the hull structure. The centerboard, usually pivoted at its forward end, is adjusted by vertical movement either to its lower, or operating position, or to its upper position, in which it projects through the slot into the box, also known as the well or "trunk."

The centerboard is objectionable for many reasons. The slot extends lengthwise of the boat and requires the cutting of several of the frame cross members, thus weakening the hull structure. It is extremely difficult to construct an adequate joint between the bottom of the centerboard box and the slot. The stress placed on this centerboard box when the boat is under hard pressure of canvas is considerable. Great leverage is obtained by the blade of the board against this inner wall of the box and in time it becomes racked and soon leaks at the keelson where the well is affixed to the boat bottom.

It is impossible to reach the surfaces of this joint for painting purposes so that the joint usually deteriorates by decay, requiring repairs at more or less regular intervals. Another objection to the centerboard is that it clutters the inside of the boat.

The present invention aims to eliminate the centerboard with its many faults, and provide a leeway control device which is more effective and which, because of its simplicity, can be embodied in a boat at lower cost.

The invention will be understood from a consideration of the accompanying drawings illustrating one embodiment of the invention by way of example.

In these drawings:

Fig. 1 is a view in perspective, looking from beneath and from the forward quarter, of a small sailboat embodying the invention. The mast and sail have been omitted in the drawing.

Fig. 2 is a view of the boat in vertical transverse section taken on line 2—2 of Fig. 1 looking towards the bow;

Fig. 3 is a fragmentary view similar to Fig. 2 showing the leeway control device in a different position;

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Fig. 4 is a fragmentary perspective view to illustrate certain details of the device;

Fig. 5 is an enlarged section taken on line 5—5 of Fig. 2;

Fig. 6 is an enlarged fragmentary view of a part shown in Fig. 2;

Fig. 7 is an enlarged bottom view of this part, and

Fig. 8 is a section taken on line 8—8 of Fig. 6.

Referring now to the accompanying drawings the sailboat 1 is constructed with the usual keel 2 and substantially flat bottom hull sections 3 and 4 on opposite sides of the keel. These two hull sections are made flat, and the midsection of keel 2 is straight, throughout the central portion of the boat, that is to say, throughout the portion which, in a centerboard boat, would correspond to the position of the centerboard, for a reason which will appear later on. The V-shaped bottom type of boat built of suitable laminated wood such as marine plywood is shown. The boat may also be of metal or may follow any of the many planked methods for flat or V-type hull construction.

The leeway control device of the invention comprises a structure having two fin elements or surfaces, namely a fin element 5 and a relatively narrow fin element 6, that is two fin elements rigidly secured to one another in fixed angular relationship, one fin being substantially greater in width than the other, and preferably several times greater. It will be understood that the width of fin element 5 will be chosen to suit the size of the boat on which it is to be used taking into account the amount of sail, type of rigging etc. Thus for example these two fin elements may each consist of a flat and substantially rigid plate, of steel, bronze or any appropriate material. Approximately one-quarter inch (¼") steel plate is suitable (preferably galvanized or otherwise treated to resist corrosion).

The fin elements may be cut therefrom in any suitable shape or configuration but the width of element 5 should be not more than half the beam of the boat. The inner edges of the fin elements are rigidly secured on an appropriate mounting. They may be made straight and secured to a supporting rod 7 (Fig. 4) by welding, and in order to impart rigidity to the structure a fillet 8 of weld material may be laid along the surface of rod 7 between the two plates, or other suitable bracing means may be used.

The length of the leeway control device, that is to say the length of the two fin elements 5 and 6, is such as to correspond with the length of the

usual centerboard section, although they can be made either shorter or longer depending upon the amount of the surface desired. The device is pivoted at its front and rear ends to the keel structure 2 so that it can be swung cross-wise of the boat about these pivots. As illustrated in the drawings these pivots may be formed by extensions 9 at each end of supporting rod 7, one of which is shown in detail in Fig. 4 wherein the hinged keel device has been inverted for the sake of clearness of illustration. The front and rear pivotal extensions 9 are received in bearing blocks 10 (Fig. 4) which may be secured to the keel structure by means of bolts applied through the apertures 11.

The angular relationship between the two fin elements 5 and 6 is such that when element 5 is in the vertical position as shown in Figs. 1 and 2, that is in alignment with a vertical plane through the keel, the other fin element 6 lies against one of the flat bottom hull sections, for example section 4. Accordingly the angle between the two fin elements is equal to one-half the outside angle between the bottom hull sections. For a flat bottomed boat the outside angle between the bottom hull sections on opposite sides of the keel is 180° and, therefore, the angle between the two fin elements of the leeway control device would be 90°. For a V-bottom boat, the outside angle between the corresponding two bottom hull sections is greater than 180° and therefore the angle between the two fin elements is greater than 90°, as is the case in the example shown in the drawings.

Cam action catches or securing devices, indicated generally by numeral 12 and manually operable from inside the hull, secure or release the keel fin structure as desired. These catches clamp the edge of the narrow fin element 6 firmly against the bottom of hull section 4. Two or more of these catches may be provided depending on the size of the boat. When the narrower fin element 6 is swung into alignment with the plane of the keel the relatively wide fin element 5 is positioned against the flat bottom hull section 3. One or more of the clamping devices 12 may be arranged to operate on the edge of fin element 5 to hold it firmly against the surface of flat bottom hull section 3. The hull structure is properly reinforced in the keel area to provide for the stresses involved. These devices will be described in detail later.

With this leeway control device the boat can be operated in a seaway with either the smaller or the larger fin surface. Also when entering shallow water the device can be adjusted for operation with the narrow fin element. The adjustment of the keel fin device from one position to the other may be controlled in various ways, for example, by means of a line 13, one end of which is fastened to the bottom of the wide fin element 5 at the rear, and when operating the boat with this fin element in operative position, line 13 is carried to the stern of the boat near rudder 14 and made fast to a cleat placed at any convenient point on the transom. When it is desired to swing the wide fin element 5 upwardly so as to bring fin element 6 into operative position, line 13 is loosed from the cleat and carried around the side of the boat as shown in the drawings, and by hauling upward on this line over a roller sheave the fin element 5 is swung upwardly and then locked in position by turning securing device 12. Line 13 is then made fast to cleat 15 as shown in Fig. 3. Line 13 may conveniently be made of one-eighth inch (⅛") flexible steel cable.

The cam action securing devices 12 are all alike and their construction is illustrated in detail in Figs. 5–8 inclusive. Referring to Fig. 5, each device is provided with an operating hand hold 16 which is accessible from the inside of the hull, a section of the floor boards 17 being made removable, when necessary, for this purpose. Hand hold 16 is arranged at the upper end of an operating rod or shaft 18, the upper portion of which is journaled in a bracket 19 which is secured in any suitable manner, as by means of the bolts 20, to the hull. Referring to Figs. 2 and 5, the hull section 4 is reinforced as indicated at 21, for example, by superposed layers of laminated wood bonded for marine use, in order adequately to support the two securing devices 12. Hull section 3 is similarly reinforced to accommodate the single securing device 12 on that side of the boat.

Operating shaft 18 extends downwardly through a stuffing box and terminates at its lower end in a clamping head 22. The stuffing box has a stationary barrel 23 which is appropriately mounted in the reinforcement 21 and extends through the bottom of the hull section. The barrel is provided with suitable packing around shaft 18, and an adjustable sleeve 24 is provided to hold the packing in place in such a way as to prevent leakage around the shaft.

Clamping head 22 is shown in bottom view in Fig. 7 and when in the full line position engages the outer surface of one of the fin elements (fin element 6 in this instance), and when turned to the dot and dash position releases the fin element. Clamping head 22 is formed with a sloping cam surface 25 as shown particularly in Figs. 6 and 8 and of ample surface area so that when hand hold 16 is turned to rotate the clamping head from the dot and dash position of Fig. 7 to the full line position, the outer surface of the fin element is engaged by this cam surface and the fin element is thereby forced firmly against the bottom of the hull.

By means of the leeway control device of the present invention, considerable additional space is provided within the boat which would otherwise be occupied by a centerboard trunk, and in small boats this additional space is particularly valuable. The device is simple and can be manufactured at low cost. By clamping one of the two fin elements against the bottom of the boat the other fin element is held securely in position to withstand the side thrusts to which it is subjected.

It will be understood that although the invention has been illustrated and described in considerable detail in connection with a single embodiment, various changes can be made without departing from the spirit of the invention, the scope of which is set forth in the appended claims.

I claim:

1. In a boat having a straight keel section and two substantially flat bottom hull sections on opposite sides of said keel section, a leeway control structure comprising two fin elements one wider than the other and disposed in fixed angular relation to each other, said structure being pivoted lengthwise of said keel section and pivotally movable to position either of said fin elements in alignment with a vertical plane through the keel, the other of said fin elements being simultaneously positioned against one of said hull sections, and releasable means for securing said

other fin element against its corresponding hull section, comprising a shaft extending through the hull bottom, a stuffing box therefor, and a cam shaped head on the lower end of said shaft engageable with the margin of said fin element by rotation of said shaft.

2. In a boat having a straight keel section and two substantially flat bottom hull sections on opposite sides of said keel section, a leeway control structure comprising two fin elements one wider than the other and disposed in fixed angular relation to each other, said structure being pivoted lengthwise of said keel section and pivotally movable to position either of said fin elements in alignment with a vertical plane through the keel, the other of said fin elements being simultaneously positioned against one of said hull sections, and releasable means for securing said other fin element against its corresponding hull section, comprising a shaft extending through the hull bottom, a stuffing box therefor, and cam means operable by said shaft and engageable with said fin element by rotation of said shaft.

3. In a boat having a hull with a straight keel section, a leeway control structure comprising two fin elements disposed in fixed angular relation to each other, said structure being pivoted lengthwise of said keel section and pivotally movable to place either of said fin elements in alignment with a vertical plane through the keel to control the leeway of the boat, and means for maintaining said structure in leeway control position comprising clamping mechanism on the boat hull for clampingly engaging the fin element of said structure which is not in leeway control position, one of said fin elements being of substantially different width than the other so as to render the boat maneuverable in shallow or deep water as desired.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
595,161	Gibb	Dec. 7, 1897
690,685	Anrep	Jan. 7, 1902
709,417	Mayo	Sept. 16, 1902
779,440	Pool	Jan. 10, 1905
1,270,466	Van Buren	June 25, 1918