March 29, 1960 W. D. GASTON 2,930,341

MOUNTING BRACKET AND THRUST BOARD FOR OUTBOARD MOTORS

Filed June 25, 1959

FIG. 1.

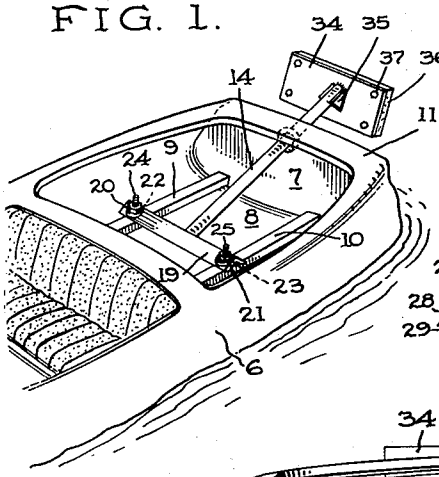


FIG. 3.

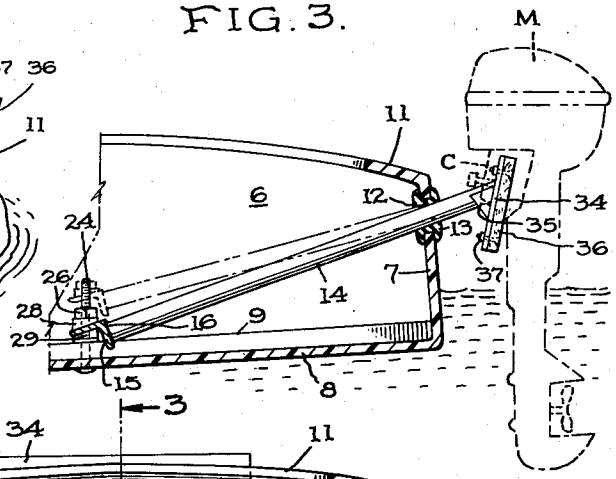


FIG. 2.

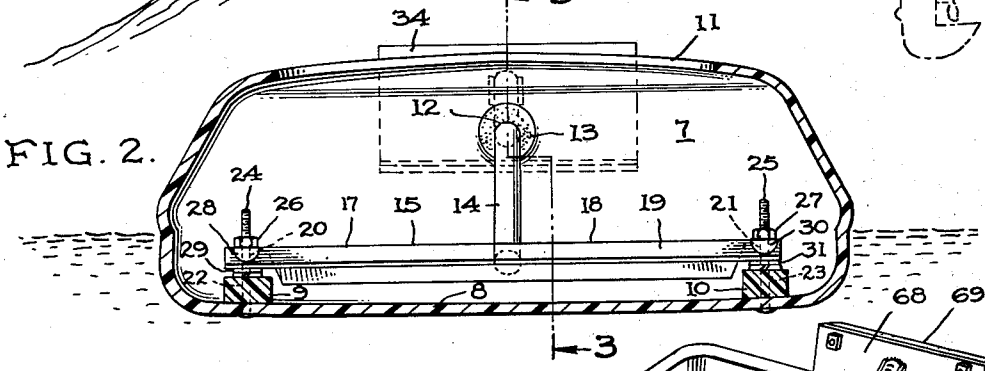


FIG. 4.

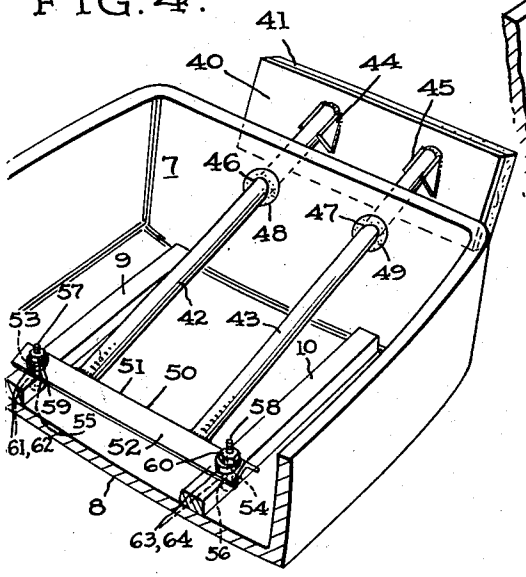
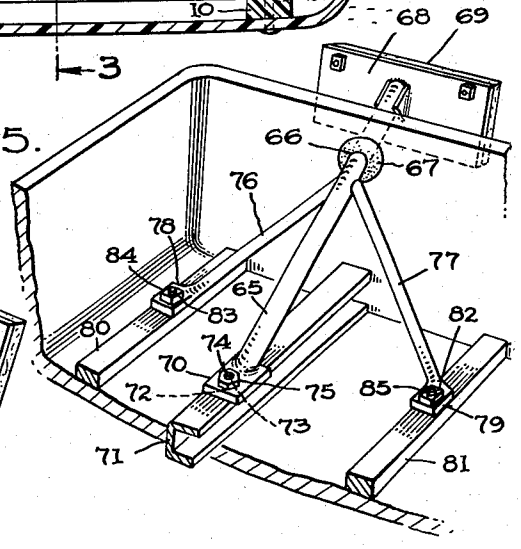


FIG. 5.



INVENTOR

WILLIAM D. GASTON

BY Cameron, Kerkam & Sutton

ATTORNEYS

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MOUNTING BRACKET AND THRUST BOARD FOR OUTBOARD MOTORS

William D. Gaston, Austin, Tex.

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9 Claims. (Cl. 115—17)

This invention relates to an improved mounting bracket and thrust board for outboard motor boats designed to support the outboard motor astern of the transom of the boat in improved fashion. The invention is primarily designed to eliminate many of the defects inherent in current outboard motor mountings and to make the mounting of the motor more efficient and adaptable than has previously been possible.

Conventionally, outboard motors are mounted by means of their clamps directly over the upper edge of the transom of the boat, which method of mounting requires that the transom be of considerable mechanical strength and also limits the freeboard height of the boat at the stern or transom. Further, with the conventional type of mounting of outboard motors directly over the upper edge of the transom, transom and stern design are strictly limited to plane and substantially rectilinear forms.

With the more powerful outboard motors which are presently available, i.e., up to fifty horsepower, extreme demands are made by the weight, thrust, vibration and torque of the motor upon the transom of the boat, necessitating in many instances extreme reinforcement and the use of much heavier materials than are desirable in the stern and transom sections of the boat.

It is therefore a primary object of this invention to evolve an improved mounting bracket and thrust board structure for supporting outboard motors at the stern of a boat which will obviate the foregoing difficulties and which will distribute and reduce the strains and stresses imposed by the motor or motors on the transom and stern of the boat.

It is another object of this invention to evolve such an improved mounting bracket for outboard motors which will be adjustable to accommodate motors of varying lengths and horsepower and by means of which the angle of attack of the motor may be varied, as desired.

It is a further object of this invention to evolve such a mounting bracket which will be readily adaptable to the modern fibreglass hulls and which will not interfere with desired hull and transom design.

It is an object of this invention to evolve such a mounting bracket and thrust board which will distribute the loads and stresses normally imposed upon the transom of the boat over a wide area of the hull thereof to eliminate possibility of damage and to permit desired reduction in weight and mechanical strength of the transom of the boat.

Other and further objects of this invention will become apparent as this specification proceeds.

Referring to the drawings, Fig. 1 is a partial perspective view of the stern section of a boat hull, showing one embodiment of the improved bracket and thrust board mounted therein;

Fig. 2 is a cross-sectional view of the boat hull and bracket of Fig. 1 taken on a line directly forward of the base or reaction member of the bracket;

Fig. 3 is a longitudinal sectional view of the mounting bracket and thrust board taken on line 3—3 of Fig. 2;

Fig. 4 is a partial perspective view of a modified form of the mounting bracket and thrust board in position in the stern of a boat; and

Fig. 5 is a partial perspective view of another modification of the mounting bracket and thrust board.

In the drawings, Figs. 1, 2 and 3, 6 designates a boat hull provided with a stern or transom section 7, a bottom 8 and longitudinal stringers 9 and 10, which extend the length of the bottom of the boat in parallel relationship with each other. A combing 11 may be provided about the upper, gunwale area of the stern section of the boat and across the top of transom 7, as shown.

Transom 7 is preferably provided at its upper, central portion with bracket bar recess 12, which is preferably of circular configuration and is provided about its inner periphery with flexible sealing ring or gasket 13, formed of rubber or other suitable flexible sealing material. Gasket 13, as shown in Fig. 3, is preferably channeled about its periphery to fit the transom walls about recess 12 and acts as a sealing liner for recess 12. It is adhesively affixed to the inner and outer surfaces of transom 7 about bracket bar recess 12, for a purpose hereinafter to be discussed at more length.

Main bracket bar 14 is shown passing through bracket bar recess 12 and adjustably sealed therewithin adjacent its upper, outer extremity by means of flexible sealing ring 13 in such fashion that it may be moved angularly therein, as desired. Bracket bar 14 is preferably formed of steel tubing or pipe and is preferably circular in cross-section. It is provided at its forward extremity with a rectangularly disposed brace or reaction member 15 which is preferably formed of a rectangular steel channel. The forward end of bracket bar 14 is preferably welded to the center of rear face 16 of brace 15 in such fashion that brace 15 forms a T head at the lower extremity of bracket bar 14, at a right angle thereto, with its arms 17 and 18 extending equidistant to each side of the lower extremity of bracket bar 14. Brace or reaction member 15 is preferably of a width equal to the distance between the outer edges of stringers 9 and 10, whereby its lateral extremities are aligned over stringers 9 and 10. The outer extremities of face 16 of brace 15 are preferably cut away adjacent stringers 9 and 10, as shown in Fig. 2, to permit free vertical movement of brace 15 with respect to stringers 9 and 10.

The lateral extremities of forward face 19 of brace 15 are preferably bored at 20 and 21 to coincide with bores 22 and 23 disposed vertically in stringers 9 and 10 and extended downwardly through the bottom of the boat hull. Bolts 24 and 25 are provided passing, respectively, through bores 22 and 23 in stringers 9 and 10 and through bores 20 and 21 of face 19 of brace 15. Nuts 26 and 27 are provided on bolts 24 and 25 to maintain brace 15 in position against stringers 9 and 10. Washers 28—29 and 30—31 are provided on bolts 24 and 25, respectively, on opposite sides of bores 20 and 21 of brace 15, to provide a firm and adjustable mounting for the extremities of brace 15 on stringers 9 and 10. Washers 28—29 and 30—31 may be formed of heavy rubber or other resilient material to impart flexibility and vibration resistance to the extremities of brace 15. As will be discussed later in more detail, the elevation of brace 15 above stringers 9 and 10 may be varied, as desired, by varying the number and size of lower washers 29 and 31 which are disposed beneath the extremities of face 19 thereof on stringers 9 and 10, respectively.

Thus, it will be seen that by removing nuts 26 and 27 and raising bores 20 and 21 off bolts 24 and 25 additional washers may be added over bolts 24 and 25 to increase the elevation of brace 15 and vary the angle of bracket bar 14 with respect to transom 7 of the boat.

At its rear extremity bracket bar 14 is provided with

a thrust plate 34 which is preferably formed of steel and is appropriately welded and braced adjacent its center 35 to the extremity of bracket bar 14. As shown, thrust plate 34 is preferably inclined at an acute angle to the axis of bar 14 and is provided at its outer surface with a thrust board 36 which is preferably bolted thereto by means of bolts 37. Thrust plate 34 and thrust board 36 are designed to receive the mounting clamps C provided at the forward extremity of a conventional outboard motor M. The size and dimensions of thrust plate 34 and board 36 may be varied within a wide range, depending upon the size and horsepower of the motor or motors to be mounted thereon.

An alternative embodiment of the invention is shown in Fig. 4, incorporating an enlarged thrust plate and board 40 and 41 mounted on paired bracket bars 42 and 43, to the rear extremities of which thrust plate 40 is appropriately welded and braced at 44 and 45. It will be noted that in this embodiment of the mounting bracket structure the thrust plate and board 40 and 41 extend substantially the full width of the transom of the boat. This type of bracket is particularly adapted to double motor installations.

In this embodiment of the invention two equally spaced orifices 46 and 47 are let into the upper section of the transom 7 of the boat, provided about their inner peripheries with resilient sealing rings 48 and 49 which form a sealing contact about bracket bars 42 and 43 to prevent ingress of water thereabout at the transom and to reduce vibration at the transom.

At their forward extremities bracket bars 42 and 43 are appropriately welded or otherwise affixed to rear face 50 of reaction member or brace 51 which provides a support for the bracket structure against stringers 9 and 10. Forward face 52 of reaction member 51 is appropriately bored adjacent its extremities at 53 and 54 in alignment with appropriate vertical holes 55 and 56 bored through stringers 9 and 10 to receive bolts 57 and 58. Nuts 59 and 60 and washers 61—62 and 63—64 are provided on bolts 57 and 58 to maintain brace 51 firmly against studdings 9 and 10. Here again, when it is desired to raise brace 51, additional washers or shims may be added under plate 52 thereof on bolts 57 and 58 to vary the angle of thrust board 41.

To raise or lower brace 51 nuts 59 and 60 are removed from bolts 57 and 58 and brace 51 is raised upwardly to free its terminal bores 53 and 54 from bolts 57 and 58. Washers are then either added over bolts 57 and 58 or removed therefrom to regulate the height of brace 51 and the angularity of thrust plate 40 and board 41.

An alternative embodiment of the invention is illustrated in Fig. 5. In this embodiment of the invention a single bracket bar 65, passing through transom recess 66 and seal 67 supports at its outer extremity thrust plate 68 and thrust board 69, thrust plate 68 being appropriately welded and braced thereto. At its forward extremity bar 65 is provided with a flattened foot member 70 registering with and supported on the upper surface of channel member 71, disposed longitudinally of the central axis of the bottom of the boat. Foot member 70 is provided with a bore 72, registering with bore 73 in channel member 71. A headed bolt 74 provided with nut 75, passes through bore 73 of channel 71 and through bore 72 in foot 70 to maintain foot 70 firmly against channel member 71. Angular braces 76 and 77 are shown affixed at their upper extremities to bracket bar 65 as by welding, and extend downwardly and rearwardly therefrom at an acute angle. At their lower extremities, braces 76 and 77 are provided with bored feet 78 and 79 seating on stringers 80 and 81 and appropriately affixed thereto by means of bolts 82 and 83 provided with nuts 84 and 85.

In this embodiment of the invention, when it is desired to change the angularity of thrust board 69 and its supported motor, nuts 75, 84 and 85 are loosened and shims or washers may be placed under feet 70, 78 and 79 to elevate them. The nuts are then replaced and tightened down. Here the forces set up by the motor are transmitted into the hull of the boat through bar 65 and braces 76 and 77 and thus are divided through longitudinal channel member 71 and parallel stringers 80 and 81.

In the embodiment of the invention shown in Figs. 1, 2 and 3, when it is desired to lower thrust board 36 to increase the angle of attack of the motor, nuts 20 and 21 are removed from bolts 24 and 25, respectively, reaction brace 15 is then raised off bolts 24 and 25 and appropriate washers or shims are placed over bolts 24 and 25, to the desired height. Reaction brace 15 is then replaced on bolts 24 and 25 and nuts 20 and 21 are replaced and screwed down to hold brace 15 firmly against the washers on stringers 9 and 10. Where it is desired to decrease the angle of attack of the motor the converse of this operation is followed, washers being removed from bolts 24 and 25 to lower brace 15 and thus raise thrust board 36, bracket bar 14 pivoting in transom recess 12.

With respect to the double-bracket embodiment shown in Fig. 4, an analogous operation is conducted to raise or lower thrust board 44 and vary its angularity, washers being added or removed from bolts 57 and 58 to lower or raise the thrust board, as desired. In this embodiment of the invention an equal number of washers must be added or taken away from the bolts beneath brace 51 to maintain its extremities at equal elevation above studdings 9 and 10. Here again, bracket bars 42 and 43 pivot in orifices 46 and 47 during the adjustment of brace 51 over studdings 9 and 10. As aforesaid, nuts 59 and 60 are removed from bolts 57 and 58 and the bored extremities of brace 51 are raised off bolts 57 and 58 to add or subtract the desired number of washers, to regulate the height of brace 51 above studdings 9 and 10.

In the embodiment of the invention shown in Fig. 5, when it is desired to lower thrust board 69 and increase the angle of attack of the motor, nut 74 of foot 70 of bar 65 is loosened, as are nuts 84 and 85 of feet 78 and 79 of braces 76 and 77 and appropriate shims are then slid under feet 70, 78 and 79 to adjust the angularity of thrust board 69 and the angle of attack of the motor supported thereby. With thrust board 69 adjusted as desired, nuts 74, 84 and 85 are then tightened down to maintain the entire inboard bracket structure in the desired position. When it is desired to raise thrust board 69 and reduce the angle of attack of the motor the converse of this operation is carried out.

As the distance from the thrust plate to the transom orifice is approximately ¼ to ⅓ of that from the transom orifice forwardly to the brace or reaction member for the bracket the static loads are proportionately reduced at the reaction member of the bracket.

Thus it will be seen that many improvements and advantages are obtained through the use of this novel motor bracket. The only load transmitted into the hull at the transom recess is the reaction of the static weight of the outboard motor or motors mounted on the thrust board. By mounting the reaction member for the bracket on the studdings of the bottom of the boat, the load from the thrust of the motor or motors is carried into the hull of the boat in its entirety and only the static weight of the motor is carried by the transom. The same applies to the torsional forces generated when the motor is turned to one side or the other. These forces are carried by the main bracket bar through the transom recess into the foot or reaction member and thence by reaction into the hull.

Further, it will be seen that as the foot or reaction member of the bracket is raised, thus changing the angle of the thrust board, the angle of attack of the motor suspended on the thrust board will be increased. Conversely, lowering the foot member of the bracket on the studdings will decrease the angle of attack of the motor.

Numerous advantages over the prior art are obtained by this novel mounting bracket. Thus, the novel bracket

resolves all forces imposed by the motor into the entire hull of the boat and into smaller and more widely distributed loads. Further, these loads are carried largely by the bracket structure itself and the properties of the bracket structure are readily determinable.

Due to the fact that the load carried by the transom is greatly reduced, the transom may be made of much lighter material and need not have the mechanical strength and reinforcement required when the motor is entirely supported by the transom, as in conventional mountings.

A further advantage of this novel bracket is that it allows any type of design styling of the transom, whereas in conventional mountings the transom design is strictly limited to a plane vertical surface. Also, motors of long or short shafts may be used merely by varying the dimensions and height of the thrust board. Further, the angle of attack of the motor, as aforesaid, may be regulated at will by adjusting the relative position of the reaction member of the bracket, which adjustment is directly translated to the thrust board.

The new bracket reduces vibration to a minimum and thus reduces possibility of damage to the basic hull structure. In certain types of hulls the turnability of the boat is greatly improved by moving the motor astern of the transom, as the turning moment of the motor is thus increased.

In conventional motor mountings on conventional boats the freeboard height of the transom is limited by the length of the motor shaft. With the present motor bracket, the transom of the boat may be of any desired height, allowing as much freeboard at the stern as is desired.

The height of the thrust board above the rear extremity of the main brace bar of the bracket may be varied within wide limits to accommodate motors of any size and of any shaft length. The bracket may be accommodated to the smaller motors, of comparative short shaft length and to the new large motors of maximum shaft length. Further, if desired, a pivotal mounting may be provided for the thrust plate at the outer extremity of the main bracket bar whereby the angularity of the thrust plate and board with respect to the axis of the bracket bar may be varied as desired.

Many modifications of the brace or reaction member and mounting structure may be utilized without departing from the spirit of this invention. For example, worm screws and pivoted housings may be substituted for the studding bolts whereby the elevation of the reaction member and the angularity of the thrust board can be varied at will, merely by adjusting the worm screws in the housings.

The size and dimensions of the bracket and thrust board may be varied within wide limits, depending upon the size and type of boat and the size and number of motors to be mounted upon the thrust board. The dimensions of the thrust board itself may be varied to accommodate either the smallest or the largest outboard motors, its height being increased to accommodate larger motors of longer shaft length. When heavier motors are to be used a heavy dual construction, as shown in Fig. 4, should be utilized.

The invention is susceptible of numerous modifications without departing from the spirit thereof. Throughout, equivalents may be substituted for the various elements of the combination, within the spirit of the invention.

This specification is by way of illustration of certain preferred embodiments of the invention. Attention is directed to the appended claims for a limitation of its scope.

What is claimed is:

1. In a boat supported mounting bracket for outboard motors, bar means outwardly disposed through the transom of the boat, brace means affixed to said bar means and to the bottom of said boat, a thrust board affixed to the outer end of said bar means supporting an outboard motor whereby the forces exerted by said motor on said thrust board will be translated through the bar means and braces to the hull of the boat.

2. In a boat supported mounting bracket for outboard motors, bar means outwardly disposed through the transom of the boat, brace means affixed to said bar means and to the bottom of said boat, a thrust board affixed at an acute angle to the outer end of said bar means astern of the transom supporting an outboard motor whereby the forces exerted by said motor on said thrust board will be translated through the bar means and braces to the hull of the boat.

3. In a boat supported mounting bracket for outboard motors, a boat hull including bottom and transom sections, a main bracket bar extending through said transom section at an upward angle, a thrust plate affixed to the outer extremity of said bar, a thrust board affixed to said thrust plate, a reaction brace affixed to the inner extremity of said bar and extending laterally of said bottom, means affixing the extremities of said reaction brace to the bottom of said boat hull whereby forces applied to said thrust board by a motor will be translated to the bottom of said boat.

4. In a boat supported mounting bracket for outboard motors, a boat hull including bottom and transom sections, a main bracket bar extending through said transom section at an upward angle, a thrust plate affixed to the outer extremity of said bar, a thrust board affixed to said thrust plate, a reaction brace at the inner extremity of said bar and extending laterally of said bottom, bolts affixing the extremities of said reaction brace to the bottom of said boat hull whereby forces applied to said thrust board by a motor will be translated to the bottom of said boat.

5. In a boat supported mounting bracket for outboard motors, a boat hull including bottom and transom sections, a main bracket bar extending through said transom section at an upward angle, a thrust plate affixed to the outer extremity of said bar, a thrust board affixed to said thrust plate, a reaction brace affixed to the inner extremity of said bar and extending laterally of said bottom, resilient means affixing the extremities of said reaction brace to the bottom of said boat hull whereby forces applied to said thrust board by a motor will be translated to the bottom of said boat.

6. In a boat supported mounting bracket for outboard motors, a boat hull including bottom and transom sections, a main bracket bar extending through said transom section at an upward angle, a thrust plate affixed at an acute angle to the outer extremity of said bar, a thrust board affixed to said thrust plate, a reaction brace affixed to the inner extremity of said bar and extending laterally of said bottom, means affixing the extremities of said reaction brace to the bottom of said boat hull whereby forces applied to said thrust board by a motor will be translated to the bottom of said boat.

7. In a boat supported mounting bracket for outboard motors, a boat hull including bottom and transom sections, a main bracket bar extending through said transom section at an upward angle, a thrust plate affixed to the outer extremity of said bar, a thrust board affixed to said thrust plate, a reaction brace rectangularly affixed to the inner extremity of said bar adjacent said bottom, extensible means affixing the extremities of said reaction brace to the bottom of said boat hull whereby forces applied to said thrust board by a motor will be translated to the bottom of said boat.

8. In a mounting bracket and support for outboard motors for a boat, a boat hull including bottom and transom sections, stringers extending the length of said bottom section in parallel relationship, an orifice centrally disposed in the upper section of said transom, a main bracket bar adjustably mounted adjacent its upper extremity within said orifice and extending inwardly and

downwardly therefrom, a thrust plate mounted at an acute angle at the outer extremity of said bar rearwardly of said transom, a thrust board affixed to said plate, a transverse brace affixed to the lower extremity of said bracket bar and extending laterally over said stringers, bolts passing through said stringers and through the extremities of said brace, resilient washers on said bolts under said brace, nuts on said bolts over said brace whereby the elevation of said brace above said studdings and the angularity of said thrust plate and board may be adjusted as desired.

9. In a boat supported mounting bracket for outboard motors, a main bar angularly disposed upwardly from the bottom of the boat through a recess in the

transom thereof, sealing means in said recess, a thrust plate affixed to the upper extremity of said bar, a thrust board affixed to said thrust plate, a reaction brace affixed at its center to the lower extremity of said bar and extending at right angles thereto over the stringers of the boat bottom, bolts passing through the stringers and the lateral extremities of said reaction member, washers on said bolts under the extremities of said reaction member, nuts on said bolts above the extremities of said reaction member whereby elevation of said reaction member on said bolts will vary the angle of attack of a motor suspended on said thrust board.

No references cited.