Dec. 1, 1964 P. R. FREDERICK 3,159,131

BOAT TRIM FLAPS

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Fig. 1

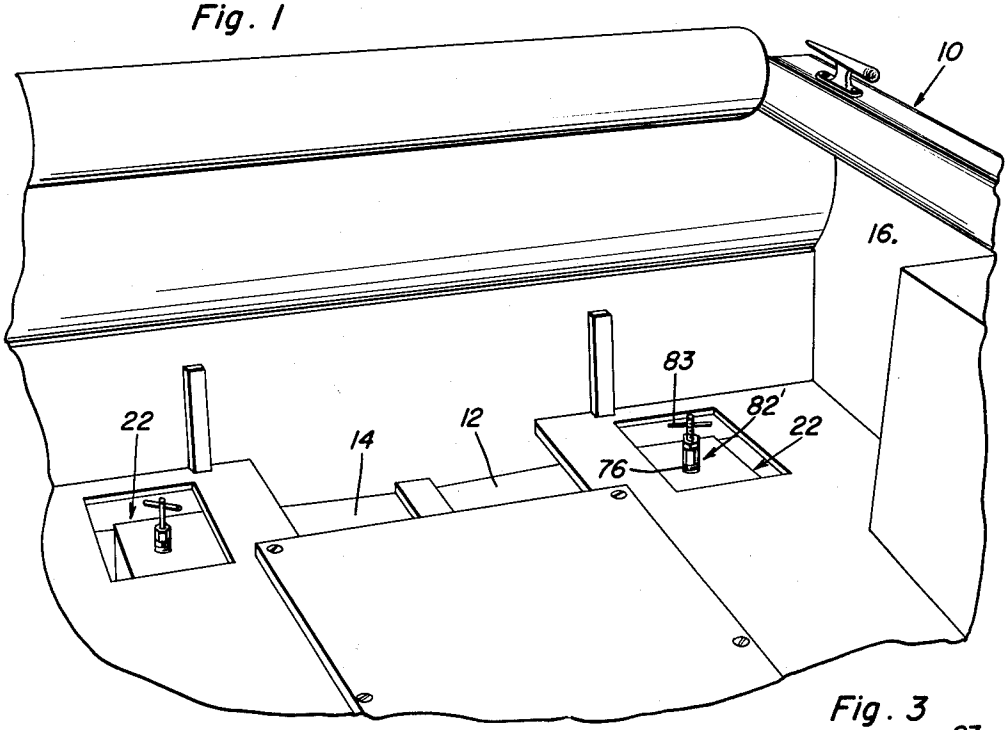


Fig. 2

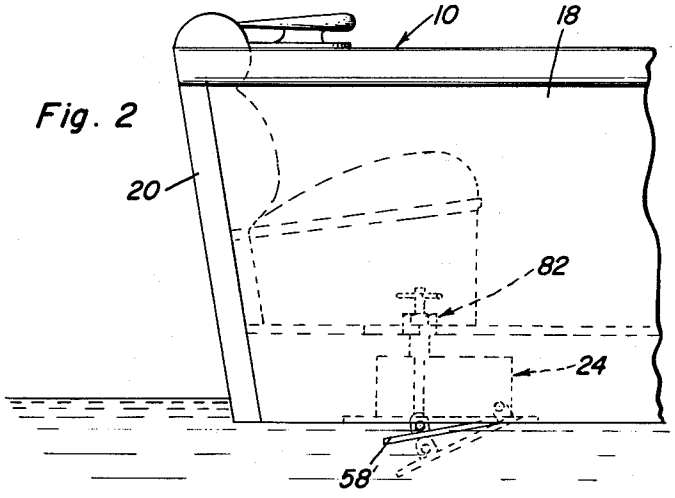
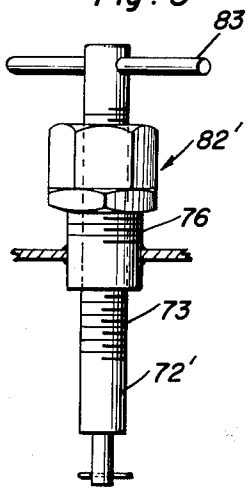


Fig. 3



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BOAT TRIM FLAPS

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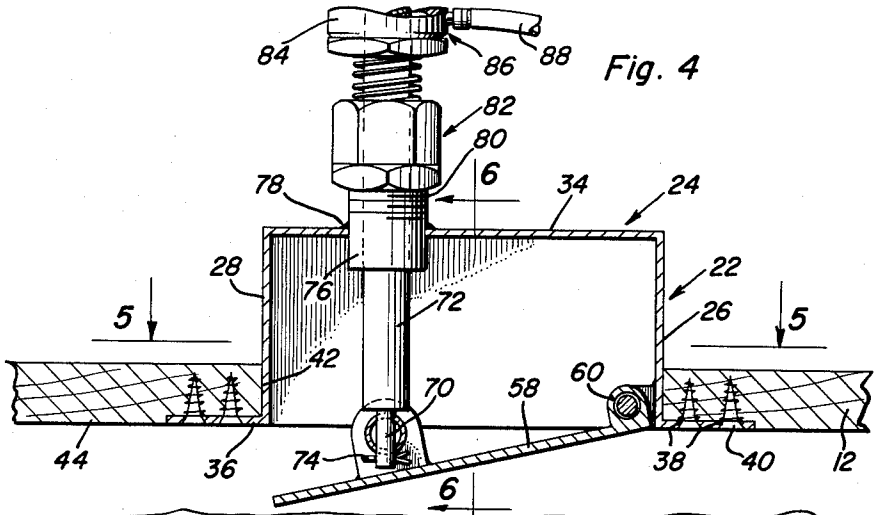


Fig. 4

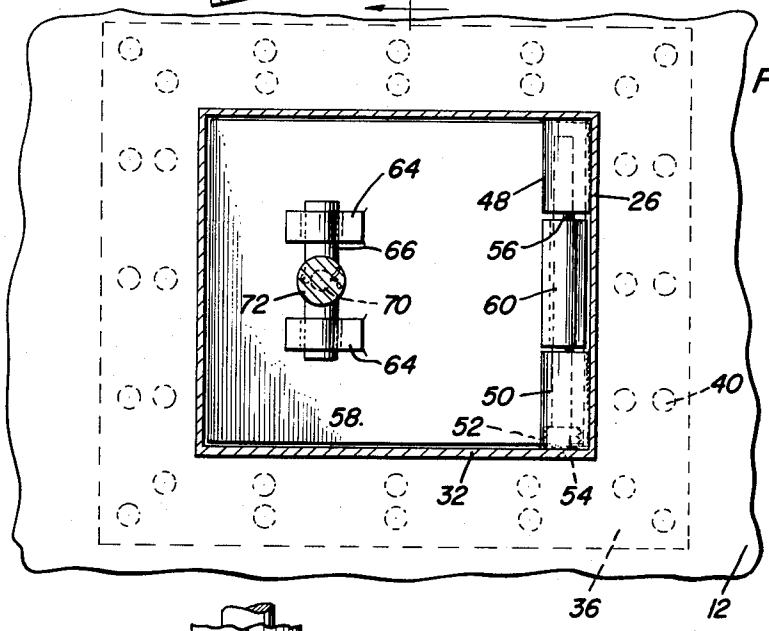


Fig. 5

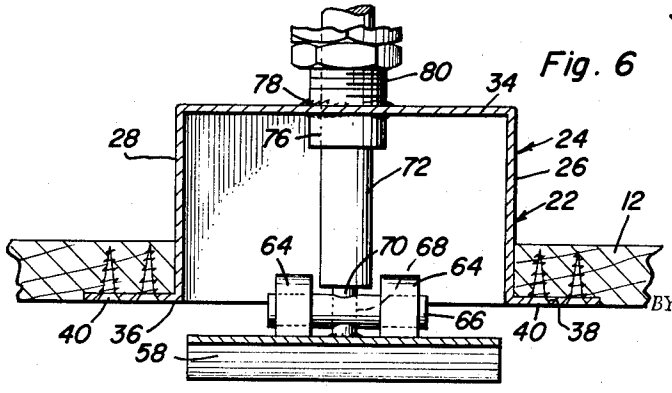


Fig. 6

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3,159,131

BOAT TRIM FLAPS

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This invention relates to a novel and useful device adapted to be mounted on the aft portion of the bottom of a boat hull and disposed on opposite sides of the longitudinal centerline of the boat hull forwardly of the transom thereof.

The boat trim flaps of the instant invention form small planing members movable from retracted positions substantially flush with the bottom surfaces of a boat hull to rearwardly and downwardly inclined positions whereby the upward thrust effected by the flaps may be increased or decreased either simultaneously or individually. By increasing and decreasing the downward inclination of the trim flaps the inclination of the hull may be adjusted about both transverse and longitudinal generally horizontally disposed axes in order to position the hull in its optimum attitude relative to the water over which it is traveling.

By using the trim flaps of the instant invention a boat hull which is unevenly loaded either by too much weight forward or aft or to one side of the centerline may be caused to assume its optimum attitude relative to the water over which it is traveling by properly adjusting the trim flaps of the instant invention. Accordingly, it may be seen that the trim flaps will enable the boat hull to operate with maximum efficiency at all times.

The main object of this invention is to provide a device which will enable the attitude of a boat hull relative to the water over which it is traveling to be adjusted as desired.

A further object of this invention, in accordance with the preceding object, it to provide boat trim flaps that may be readily secured to substantially all types of planing type boat hulls.

Still another object of this invention is to provide boat trim flaps that may be readily adjusted either singly or in pairs.

Yet another object of this invention is to provide boat trim flaps constructed in a manner whereby the actuators therefor may be readily manipulated.

A final object of this invention to be specifically enumerated herein is to provide boat hull trim flaps in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a fragmentary perspective view of the aft portion of a conventional type of runabout shown with a pair of the boat trim flaps of the instant invention operatively mounted therein;

FIGURE 2 is a side elevational view of the embodiment illustrated in FIGURE 1, concealed parts being shown in phantom lines;

FIGURE 3 is an enlarged side elevational view of a modified type of actuator which may be used to adjust the boat trim flaps;

FIGURE 4 is a fragmentary longitudinal vertical sectional view on an enlarged scale of one of the boat trim flaps of the instant invention utilizing a modified form of actuator;

FIGURE 5 is a fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 5—5 of FIGURE 4; and

FIGURE 6 is a fragmentary transverse vertical sectional view taken substantially upon the plane indicated by the section line 6—6 of FIGURE 4.

Referring now more specifically to the drawings the numeral 10 generally designates a conventional type of runabout boat hull including a pair of aft bottom sections or portions 12 and 14 and a pair of sides 16 and 18. The boat hull 10 also includes a transom 20.

The boat trim flap assemblies of the instant invention are generally referred to by the reference numerals 22 and each comprises an open bottom housing generally referred to by the reference numeral 24. Each of the housings 24 includes front and rear walls 26 and 28 and a pair of opposite side walls 30 and 32 which are interconnected by means of a top wall 34. An open frame-like mounting flange 36 is secured to and extends about the lower edge portions of the walls 26, 28, 30 and 32. The flange 36 projects outwardly of the lower end of the housing 24 and is provided with a plurality of apertures 38 enabling conventional screw fasteners 40 to be utilized to secure the lower end of each of the housings 24 in the opening 42 formed in the corresponding aft bottom portion. The housings 24 are generally rectangular in horizontal plan and are snugly received within the openings 42 provided therefor. It will be noted that each mounting flange 36 is recessed in the bottom surface 44 of the corresponding aft bottom portion.

The front wall 26 of each of the housings 24 includes a pair of aligned and axially spaced journals 48 and 50. The end of the journal 50 remote from the journal 48 is diametrically enlarged and internally threaded as at 52 for the reception of the enlarged threaded head portion 54 of a pivot pin 56. Each of the flap assemblies 22 includes a flap member 58 and each flap member 58 has a journal 60 formed thereon which is receivable between and axially alignable with the journals 48 and 50. Accordingly, it may be seen that the pivot pin 56 is passed through the journals 48, 50 and 60 and has its externally threaded head portion 54 threadedly engaged in the enlarged portion 52 of the journal 50. Each of the flap members 58 includes a pair of upstanding journals 64 and a connecting pin 66 is rotatably received through the journals 64 and extends therebetween. The mid-portion of the pin 66 is provided with a diametric bore 68 through which the diametrically reduced portion 70 of a rod-like actuator 72 is secured by means of a cotter pin 74.

Each rod-like actuator 72 is snugly and slidably received through a corresponding mounting sleeve 76 which is secured through the corresponding upper or top wall 34 in any convenient manner such as by welding 78. The upper end of the sleeve 76 is externally threaded as at 80 and has a stuffing assembly generally re-

ferred to by the reference numeral 82 secured thereto.

The upper end of the rod-like actuator 72 comprises a piston rod including a piston (not shown) slidably received in a hydraulic cylinder 84 of a fluid motor generally referred to by the reference numeral 86. It is to be noted that the cylinder 84 may be fixedly supported from any convenient portion of the hull 10 and therefore that the introduction of hydraulic fluid into each cylinder 84 through a pair of hydraulic lines 88 communicated with opposite ends of the cylinder 84 will effect vertical reciprocation of the rod-like actuator 72 and the raising and lowering of the associated flap member 58 from a position substantially horizontally aligned with the lower surfaces of the corresponding bottom portion and a rearwardly and downwardly inclined position such as that illustrated in FIGURE 4 of the drawings.

As can best be seen from FIGURE 3 of the drawings, the rod-like actuator 72 may be replaced by an actuator 72' which has threads 73 formed thereon. Additionally, the sleeve 76 may be replaced by a sleeve 76' which is to be mounted similarly to the sleeve 76. However, the sleeve 76' is internally threaded and the upper end of the actuator 72' is threaded through the sleeve 76'. The sleeve 76' also includes a stuffing assembly generally referred to by the reference numeral 82' and the upper terminal end portion of the actuator 72' includes a cross handle 83 whereby the actuator 72' may be readily rotated to raise and lower the associated flap member 58', see FIGURE 2.

In operation, if the boat hull 10 is heavily loaded in the aft portion thereof such as by a plurality of riders, both of the flap members may be moved to the rearwardly and downwardly inclined positions illustrated in FIGURES 2 and 4 of the drawings in order to effect an upward lift on the aft portion of the hull whereby the optimum attitude of the boat hull relative to the water over which it is traveling may again be realized. In addition, should the port side of the boat hull 10 be overly loaded, the corresponding flap member may be inclined downwardly at its rear end a greater amount than the other flap member. Accordingly, the port flap member will effect a greater upward thrust on the port side of the boat than will the starboard flap member on the starboard side of the boat and the overloading of the port side of the boat will be compensated for. Further, when the boat hull 10 is moving in reverse the flap members may be selectively lowered so as to create a drag at one side of the hull in order to assist the hull 10 in turning to that side.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination with a motor boat hull including aft bottom portions disposed on opposite sides of the longitudinal centerline of said hull, a pair of boat trim flap assemblies each mounted in one of said aft bottom portions, said aft bottom portions each having an opening therein spaced forwardly of the rear end of the corresponding bottom portion and spaced laterally of said centerline, said assemblies including a pair of open bottom housings secured in said openings in fluid-tight sealing engagement with the adjacent portions of the corresponding bottom portions, a trim flap pivotally secured in each housing for rotation about an axis disposed in a plane generally paralleling the corresponding bottom portion and extending transeversely of the forward end of said housing with the free swinging portion of said flap extending rearwardly in said housing and

swingable from a raised position substantially flush with the bottom of said housing to a rearwardly and downwardly inclined lowered position projecting below the corresponding bottom portion, and actuator means operatively connected to each of said trim flaps and including movable portions mounted for movement relative to and through walls of said housings in fluid-tight sealed engagement therewith and having portions disposed within said hull for actuation thereof and operable to selectively simultaneously and individually raise and lower said flaps as desired and vary the upward thrust effected thereby either simultaneously or individually whereby the inclination of said hull may be adjusted about both transvers and longitudinal generally horiozntally disposed axes in order to position the hull in its optimum attitude relative to the water over which it is traveling when compensating for uneven loading of said hull.

2. The combination of claim 1 wherein said actuator means comprise upright elongated thrust members mounted for longitudinal movement through and in sealing engagement with the upper wall portions of said housings and pivotally secured at their lower ends to the free end portions of said flaps for movement about axes generally paralleling the axes of rotation of said flaps.

3. The combination of claim 2 wherein said actuator means comprise smooth shafts slidingly received through stuffing assemblies carried by said upper wall portions.

4. The combination of claim 1 wherein said actuator means include upright elongated thrust members mounted for longitudinal movement through and in sealing engagement with the upper wall portions of said housings and pivotally secured at their lower ends to the free end portions of said flaps for movement about axes generally paralleling the axes of rotation of said flaps, said actuator means also including threaded shafts threadedly received through stuffing assemblies carried by said upper wall portions.

5. The combination of claim 4 including handle members secured to the upper ends of said threaded shafts and disposed above said housings in said hull.

6. The combination of claim 1 wherein said housings each include opposite side and end walls interconnected by means of a top wall, a frame-like mounting flange secured to and extending about and outwardly of the lower edges of each set of said side and end walls, said housings being snugly received in said openings and said mounting flanges being secured to the undersurfaces of said bottom portions adjacent said openings.

7. The combination of claim 6 wherein said movable portions of said actuators extend through said top walls.

8. The combination of claim 1 wherein said housings each include opposite side and end walls interconnected by means of a top wall, a frame-like mounting flange secured to and extending about and outwardly of the lower edges of each set of said side and end walls, said housings being snugly received in said openings and said mounting flanges being secured to the undersurfaces of said bottom portions adjacent said openings, said actuator means comprising upright elongated thrust members mounted for longitudinal movement through and in sealing engagement with the upper wall portions of said housings and pivotally secured at their lower ends to the free end portions of said flaps for movement about axes generally paralleling the axes of rotation of said flaps.

9. The combination of claim 1 wherein said housings each include opposite side and end walls interconnected by means of a top wall, a frame-like mounting flange secured to and extending about and outwardly of the lower edges of each set of said side and end walls, said housings being snugly received in said openings and said mounting flanges being secured to the undersurfaces of said bottom portions adjacent said openings, said actuator means comprising upright elongated thrust members

mounted for longitudinal movement through and in sealing engagement with the upper wall portions of said housings and pivotally secured at their lower ends to the free end portions of said flaps for movement about axes generally paralleling the axes of rotation of said flaps, said actuator means comprising threaded shafts threadedly received through stuffing assemblies carried by said upper wall portions.

10. The combination of claim 9 including handle members secured to the upper ends of said threaded shafts and disposed above said housings in said hull.

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