United States Patent

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[72] Inventor **Gerald J. Curtis**
8806 Glen Loch, Houston, Tex. 77017

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[54] **ADJUSTABLE STABILIZER FOR BOATS**
4 Claims, 8 Drawing Figs.

[52] **U.S. Cl.** **114/66.5**
[51] **Int. Cl.** **B63b 1/22**
[50] **Field of Search** 114/66.5P

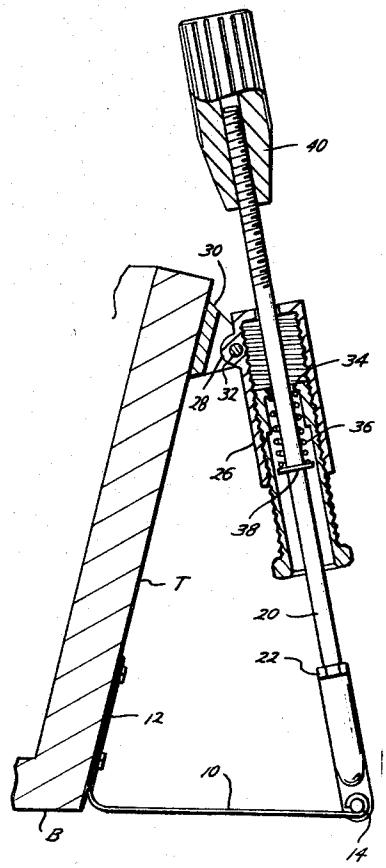
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Primary Examiner—Andrew H. Farrell
Attorney—Charles E. Lightfoot

ABSTRACT: A stabilizer device for boats to maintain a boat in a substantially horizontal position during forward movement of the same and to resist tilting, rolling or bobbing movements of the boat due to wave action. The stabilizer device includes platelike means attached externally to the stern of the boat to form an extension of the bottom surface thereof against which the water may exert an upward force tending to lift the stern of the boat thereby resisting the tendency for the stern to be depressed and the bow to rise when the boat moves forwardly in the water. Means is provided forming an adjustable, yieldable connection between the platelike means and boat at a location to yieldingly resist upward movement of the platelike means and to permit vertical adjustment of the same to regulate the stabilizing action of the water on the device.

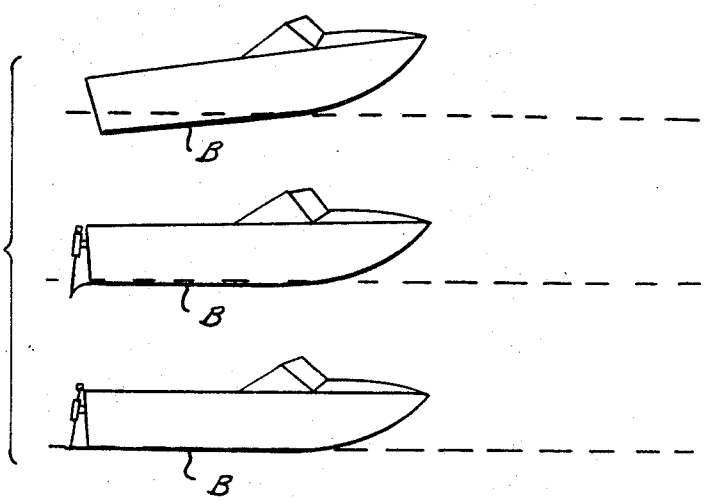


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SHEET 1 OF 3

Fig. 1



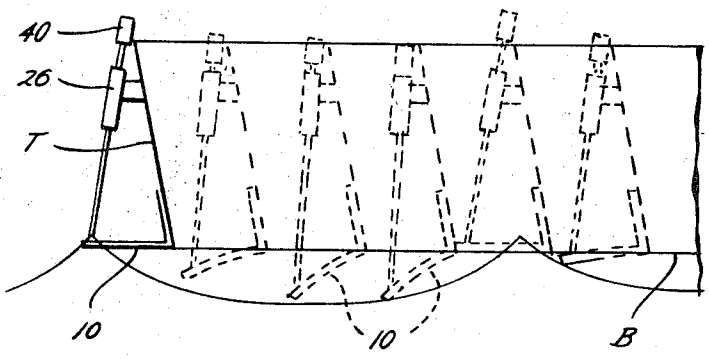
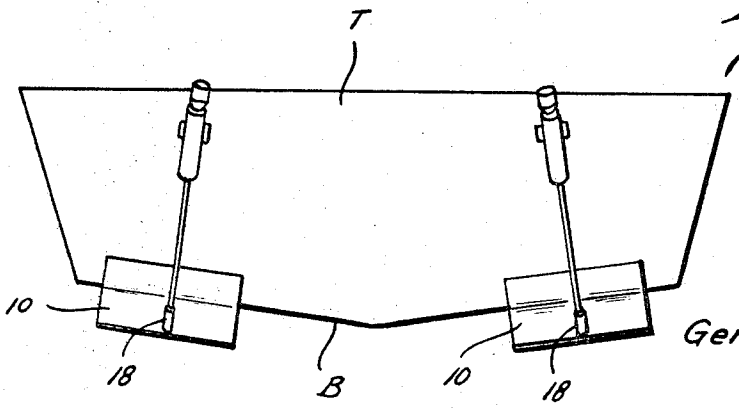


Fig. 2

Fig. 3



Gerald J. Curtis
INVENTOR.

BY
Charles E. Lightfoot
ATTORNEY

Fig. 4

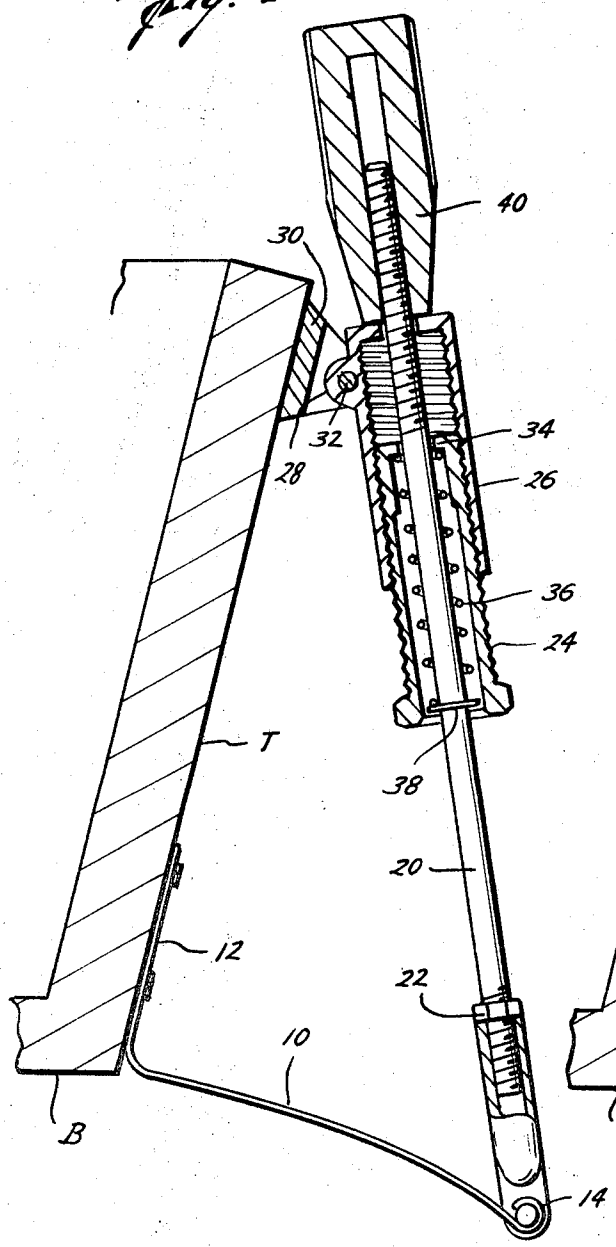
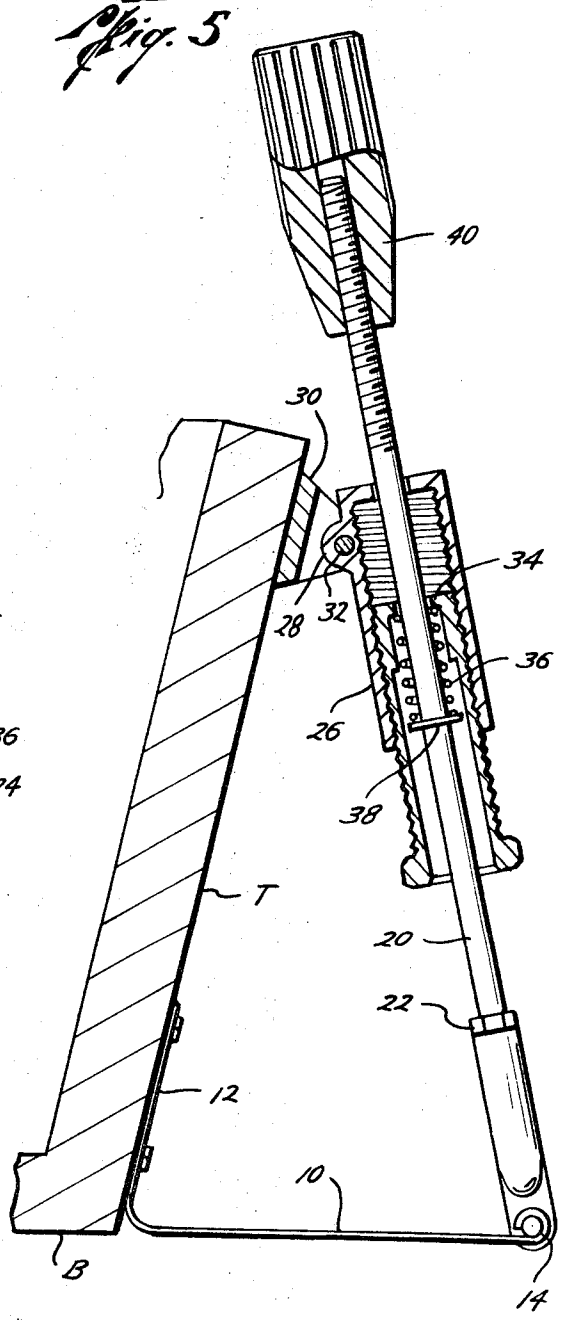


Fig. 5



Gerald J. Curtis
INVENTOR.

BY Charles E. Lightfoot
ATTORNEY

Fig. 6

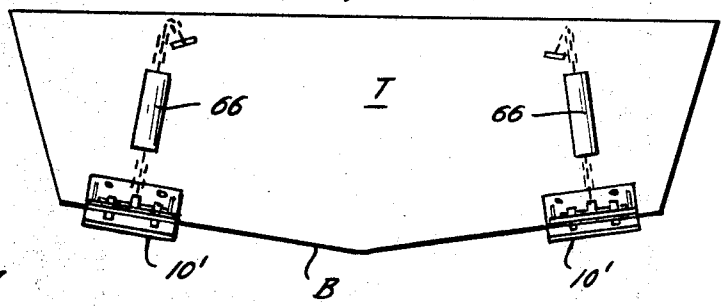


Fig. 7

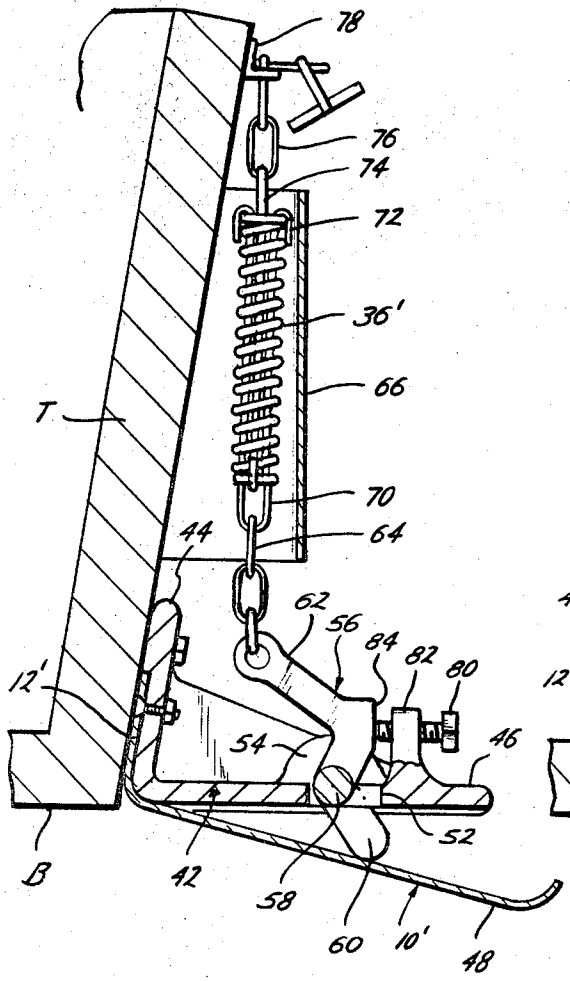
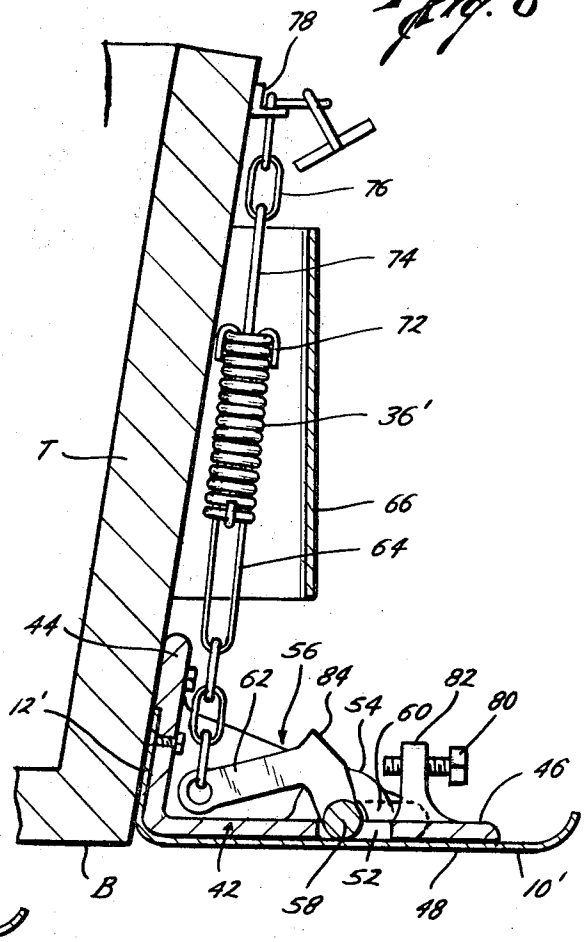


Fig. 8



Gerald J. Curtis
INVENTOR.

BY
Charles E. Lightfoot
ATTORNEY

ADJUSTABLE STABILIZER FOR BOATS

BACKGROUND OF THE INVENTION

In the operation of boats and particularly boats which are propelled at considerable speeds, such as racing boats, there is a tendency for the bow of the boat to rise out of the water to a height which increases with the speed of the boat. When operated in rough or choppy water, there is also a tendency for such boats to bob, the bow of the boat rising and falling rapidly so that there is danger of damage due to violent impact of the boat with waves.

The operation of boats of this character is often impaired by irregularities in the shape of the hull resulting from warping or other imperfection which may produce an unbalanced condition likely to cause listing or rolling of the boat.

Various expedients for overcoming these disadvantages have proposed heretofore, such as by the provision of plates extending rearwardly from the stern of the boat to form extensions of the bottom surface of the boat and having surface portions positioned to coact with the water to stabilize the motion of the boat. Such devices, as heretofore provided, are commonly positioned by trial and error without adequate means for adjustment to vary the effect of water thereon at different speeds of operation of the boat or under varying wave conditions.

SUMMARY OF THE INVENTION

Briefly described, the stabilizer or trimming device of the invention comprises a platelike member attached externally to the stern of a boat extending rearwardly therefrom to form an extension of the bottom surface of the boat in or near the plane of the bottom and against which the water may exert an upward force tending to resist the depressing of the stern and the elevation of the bow of the boat due to forward movement of the boat. The platelike member is attached to the boat by means which allows the plate to be adjusted vertically by flexing or hinging to vary the position of the plate to regulate the stabilizing effect of the water on the boat. Yieldable means is also provided forming a connection between the boat and plate member above the member and at a location on the member to yieldingly resist upward movement of the plate under the influence of the upward force exerted thereon by the water, whereby the platelike member is automatically adjusted to vary the stabilizing effect in accordance with rapidly varying conditions such as those resulting from choppy water or wave action.

BRIEF DESCRIPTION OF THE VIEWS OF THE DRAWINGS

FIG 1 is a diagrammatic view illustrating the invention and showing the manner in which the stabilizer functions when applied to a boat;

FIG 2 is a fragmentary side elevational view of the stern portion of a boat, showing the stabilizer of the invention attached thereto and illustrating the manner in which the same operates, the stabilizer being shown in dashed lines in a number of the different positions which it occupies during the operation of the boat;

FIG 3 is a rear and elevational view of a boat showing the stabilizer of the invention attached thereto;

FIG 4 is a vertical, central, longitudinal, cross-sectional view, on an enlarged scale of a preferred embodiment of the invention, showing details of construction of the same, the device being shown in its downmost position of movement;

FIG 5 is a view similar to that of FIG 4, showing the stabilizer of the invention is an upper position of its movement;

FIG 6 is a rear end elevational view of a boat, similar to that of FIG 3, showing a modified form of the stabilizer of the invention applied thereto;

FIG 7 is a vertical, central, longitudinal, cross-sectional view, similar to that of FIG 4, illustrating the modified form of the invention as shown in FIG 6, the stabilizer being shown in its downmost position; and

FIG 8 is a view similar to that of FIG 7, showing the stabilizer in its upmost position.

DETAILED DESCRIPTION OF A PARTICULAR EMBODIMENT OF THE INVENTION

The stabilizer of the invention is attached to the stern of a boat B, which may be a boat of any convenient type, such as one having the usual transom T at its rear end, two such stabilizers being ordinarily used, as seen in FIGS. 3 and 6, one on each side of the longitudinal center line of the boat. The stabilizers extend rearwardly from the stern of the boat and include platelike members having planar surfaces extending generally horizontally rearwardly in or nearly in the plane of the bottom of the boat.

As illustrated in FIGS. 4 and 5, each of the stabilizers has a flexible, platelike member **10**, preferably formed of sheet metal, of generally rectangular configuration, provided along one side with an upturned flange **12** for attachment to the transom T against the outer face thereof.

At its outer extremity the member **10** is formed with a tubular portion **14**, through which a pin **16** is pivotally extended to pivotally connect the lower end of a connector element **18** thereto, centrally of the width of the member. The upper end of the connector **18** is internally threaded for the connection thereto of the lower end of a shaft **20** which extends upwardly exteriorly of the transom T. The shaft **20** may be provided with a locknut **22** to be engaged with the upper end of the element **18** to prevent unscrewing of the shaft.

The shaft **20** passes upwardly through a tubular adjuster sleeve **24**, which is externally threaded for threadable adjustment in an internally threaded, outer tubular housing **26** which is pivotally connected to a perforated bracket **28**, secured externally to the transom, as by means of a perforated lug **30** on the housing near its upper end, through which a pivot pin **32** is extended through the perforation of the bracket.

The adjuster sleeve **24** is formed at its upper end with an internal annular flange forming an internal upper end seat **34** for a yieldable member, such as the coil spring **36**, whose upper end is seated on the seat **34** and whose lower end is seated on a washer or pin **38** affixed to the shaft **20**, mediate the ends of the shaft and which is movably disposed in the sleeve for longitudinal movement therein with the shaft.

The shaft **20** is threaded at its upper end portion to receive an adjusting nut **40**, threadably carried thereon and which may be externally knurled or fluted to be easily rotated by hand.

In adjusting the stabilizer thus applied to the boat, the nut **40** may be threaded downwardly on the shaft **20** to a position to engage the upper end of the housing **26** to limit the downward movement of the shaft **20** in the housing and the adjuster sleeve **24** may be turned in a direction to back the same out of the housing to apply any desired compressive force to the spring **36** between the upper seat **34** and the lower seat **38**. By suitably adjusting the sleeve and nut, the plate member **10** may be moved to any desired position of adjustment relative to the plane of the bottom of the boat, such as the downwardly curved position shown in FIG **4**, in which position the plate member will then be yieldingly held against upward movement by the spring **36**.

When the stabilizer is thus adjusted, the nut **40** will engage the upper end of the housing **26** to limit downward movement of the shaft **20**, while the plate member **10** will be free to flex upwardly in response to variations in the upward pressure exerted against the plate by the water as the boat moves forwardly therethrough.

The action of the stabilizer of the invention in stabilizing the movement of a boat is illustrated diagrammatically in FIG **1**, wherein the usual position assumed by a boat moving forwardly in the water is shown in the upper view, the bow of the boat tending to rise out of the water to an increasing extent as the speed of the boat is increased. With the stabilizers of the

invention applied to the boat, and properly adjusted, as described above, the upward pressure of the water against the stabilizers tends to prevent the upward tilting movement of the boat and to maintain the boat in a more nearly horizontal position during its forward movement, as seen in the middle view of FIG 1. Under conditions in which the stabilizers may be subjected to excessive upward pressure by the water, such as may occur when operating the boat in choppy water or at high speeds where waves are frequent, the plate members **10** may flex upwardly to reduce the upward force of the water tending to tilt the boat, while the boat is passing over the waves, as seen in the lower view of FIG 1, thus stabilizing the motion of the boat and preventing excessive bobbing of the same.

The stabilizing action of the stabilizer of the invention is further illustrated in FIG 2, wherein the position which the platelike member may assume in response to an increase in the upward pressure of water caused by wave action, is shown in solid lines, while positions to which the member may be moved in response to successive variations in such wave action pressure are shown in dashed lines. Thus, as the upward pressure of the water against the plate member increases beyond the downward pressure to which the spring **36** has been adjusted, the plate will be flexed upwardly by compression of the spring, and the plate member will again be flexed downwardly by the spring as the upward pressure of the water falls off, to maintain the stability of the boat.

It will also be apparent that the stabilizers will respond similarly to conditions tending to cause rolling motion of the boat such as wave action or movement of the boat in a curved path, to prevent or lessen such rolling motion.

A modified form of the invention is illustrated in FIGS. **6**, **7** and **8**, wherein the stabilizer mechanism includes a generally rectangular supporting bracket **42** of angle shape in cross section having a flange **44** adapted to be attached externally to the transom T and a platelike portion **46**, which extends rearwardly from the transom, and whose lower face is disposed substantially in the plane of the bottom of the boat. The support bracket may be shallowly recessed to receive the generally rectangular flexible, platelike member **10'**, which has an upwardly extending flange **12'** disposed between the transom T and the flange **44** of the bracket and which is attached to the bracket, and a rearwardly extending portion **48** extending beneath the portion **46** thereof.

The support bracket may be provided with a central reenforcing gusset **50** extending upwardly between the portions **44** and **46**, and has a slotted opening **52** in the portion **46** and upwardly extending perforated lugs, such as that shown at **54** on each side of the opening.

A bellcrank or lever member **56** is pivotally mounted on the bracket **42**, as by means of a pin **58** or the like, located mediate the ends of the lever and extending through the perforations of the lugs **54**. The bellcrank **56** has one arm **60** thereof which extends downwardly through the slot **52** and whose free end is rounded for engagement with the portion **48** of the flexible plate **10'** to flex this portion downwardly away from the bracket upon rotation of the crank in one direction, as seen in FIG 7, and to allow the portion **48** to flex upwardly toward the bracket, as seen in FIG 8, when the crank is rotated in the other direction.

The other arm **62** of the bellcrank **56** extends above the portion **46** of the bracket and is connected at its outer end to a chain **64**, or other suitable flexible element, extending upwardly into a hollow housing **66** attached externally to the transom T.

Within the housing **66** the chain **64** is connected to a coil spring **68**, as by means of an elongated U-shaped connector link **70** having outwardly and downwardly turned portions **72** on the free ends of its arms which are hooked over the upper end coil of the spring.

A similar link member **74** is connected to the lowermost coil of the spring **36'** and to a chain **76** which extends upwardly from the spring for releasable connection to a slotted bracket **78** having an open ended slot into which a link of the chain may be inserted. By pulling upwardly on the chain **76** the spring **36'** may be compressed to exert an upward pull on the arm **62** of crank **56** whereby the portion **48** of plate **10'** will be flexed downwardly by the arm **60**, as shown in FIG 7. When the plate has been thus flexed downwardly to the desired extent, the chain is extended into the slot of bracket **78** to hold the plate in its adjusted position.

Suitable stop means, such as the screw **80**, threadably adjustable in an internally threaded opening in a lug **82** on the support bracket may be provided, which is engageable with an abutment face **84** on the crank **56** to limit rotation of the crank in a direction to flex the plate **10'** downwardly.

The operation of this modified form of the invention is similar to that of the form illustrated in FIGS. **4** and **5**, the portion **48** of platelike member **10'** being positioned for engagement with the water to transmit upward force exerted by the water against the plate to the stern of the boat to stabilize the boat. The upward flexing movement of the plate is limited by its engagement with the portion **46** of the support bracket **42** while downward flexing of the plate is limited by engagement of the screw **80** with the abutment face **84** of the crank **56**.

In either form of the invention it will be apparent that the stabilizers may be separately adjusted to compensate for irregularities or imperfections in the shape of the boat to bring the boat to a balanced condition laterally, whereby listing or rolling of the boat due to warping of the hull or other defects may be prevented.

It will also be noted that the downward force exerted on the platelike member to yieldingly resist upward movement of the member by the upward force of the water may be regulated as desired by adjusting the compression of the spring **36** or **36'**, while the amount of upward movement of the platelike member in response to the upward force of the water is limited by the nut **40** or by the stop screw **80**.

The platelike member of the invention may, if desired, be hingedly connected to the boat for vertical swinging movement, such as by providing a hinge between the upwardly extending flange and the rearwardly extending portion of the member.

It will thus be seen that the invention, constructed and applied as described above, provides a boat stabilizer device which is of simple design and rugged construction, which is adjustable to regulate the stabilizing effect of the water thereon as the boat moves in the water, and which automatically adjusts itself to accommodate the rapidly varying conditions caused by operation of the boat in choppy water or waves.

The invention is disclosed herein in connection with particular embodiments of the same which are intended by way of illustration and it will be understood that various changes can be made in the construction and arrangement of the parts within the spirit of the invention and the scope of the appended claims.

I claim:

1. In a stabilizer for boats

a platelike member adapted to be movably connected to the transom of a boat with a planar portion of the member extending rearwardly therefrom for angular movement about an axis extending transversely of the boat in position for contact with the water to apply an upward force to the transom,

an elongated element hingedly connected at its lower end to and extending upwardly from the member at a location spaced rearwardly from the transom,

connecting means pivotally mounted on the transom for vertical rocking movement thereon and through which said element is slidably extended,

spring means surrounding said element, and

threadable means on said element and said connecting means positioned for coaction with said spring means to adjust the resistance of said spring means to upward movement of said planar portion.

2. The stabilizer as claimed in claim **1**, wherein said member is flexible.

3. The stabilizer as claimed in claim 1 including means positioned for coaction with said member and transom to limit downward angular movement of said planar portion.

4. In a stabilizer for boats, a platelike member adapted to be movably connected to the transom of a boat with a planar portion of the member extending rearwardly therefrom for angular movement about an axis extending transversely of the boat in position for contact with the water to apply an upward force to the transom,

a bracket adapted to be secured to the transom and having a portion extending rearwardly from the transom above said planar portion,

means rotatably mounted on the bracket for vertical rotational movement,

yieldable means positioned for coaction with said rotatable means and member to yieldingly resist movement of said planar portion toward said rotatable means, and

means forming an adjustable connection between said member and said rotatable means to limit movement of said planar portion away from said rotatable means.