United States Patent [19]

Krieger

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[54] **FOLDING ACCESSORY BRACKET ASSEMBLY**

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[52] **U.S. Cl.** **248/4,** 115/17

[51] **Int. Cl.** **F16m 1/02**

[58] **Field of Search** 248/4, 284, 286, 278, 279; 115/17

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Attorney, Agent, or Firm—Rogers, Ezell & Eilers

[57] **ABSTRACT**

A bracket assembly for mounting a boat accessory to a deck of the boat, and particularly adapted for mounting a trolling motor, so as to automatically position the accessory vertically in the water in an extended position and parallel to and on top of the boat deck in a retracted position. The bracket assembly generally comprises a mounting means attached to the boat deck and an accessory bracket for mounting to the accessory. Arm means are pivotally mounted between the mounting means and accessory bracket for automatically positioning the accessory bracket as the arm means are pivoted, to thereby properly position the accessory in the extreme positions.

13 Claims, 13 Drawing Figures

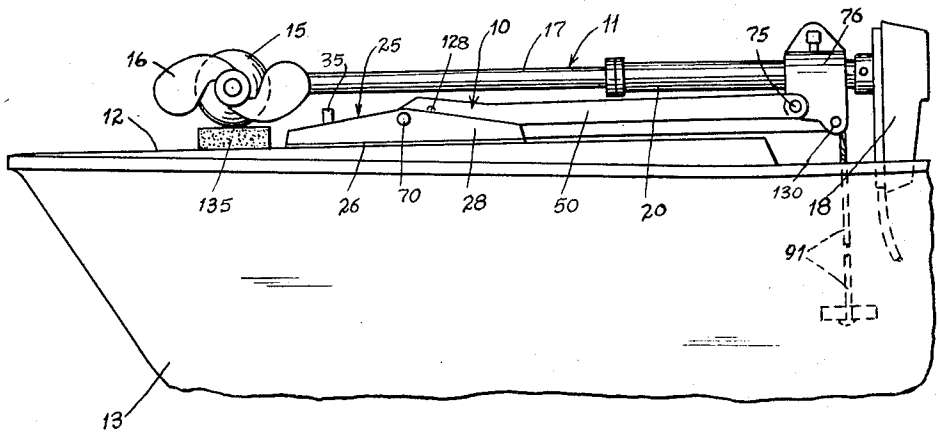


Fig. 1.

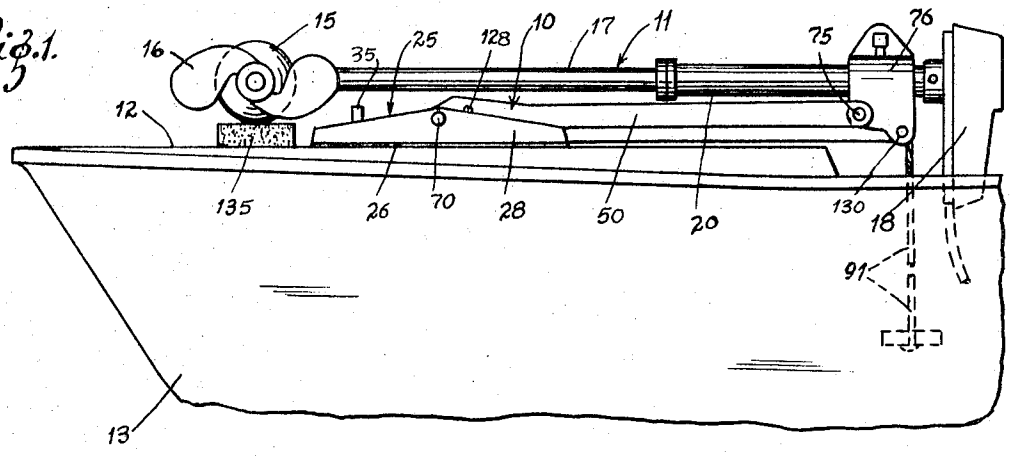


Fig. 2.

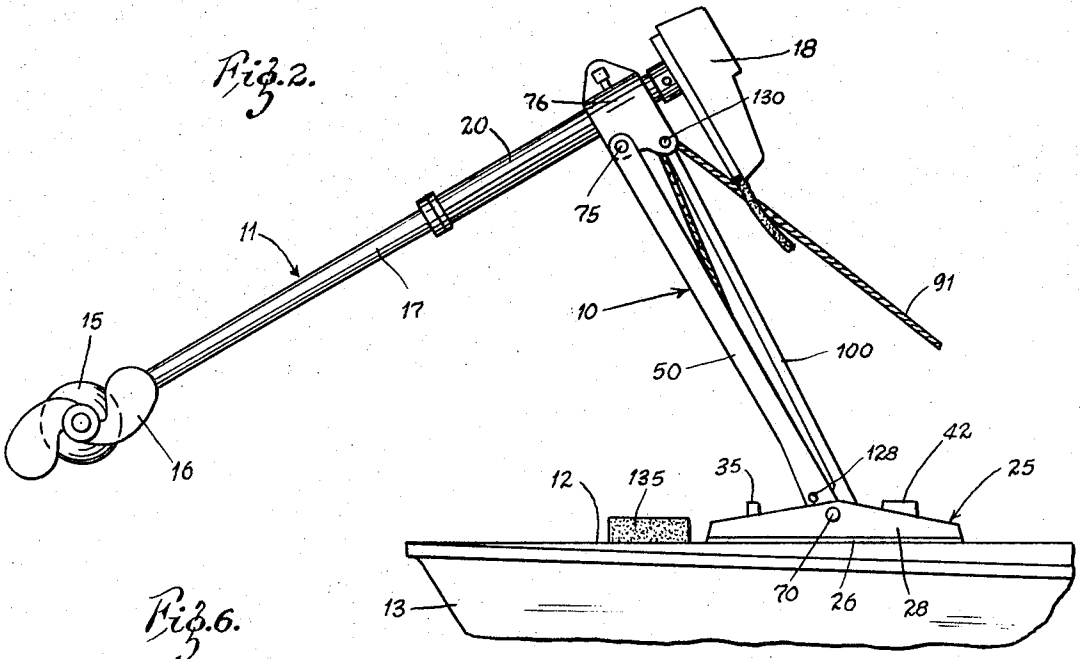


Fig. 6.

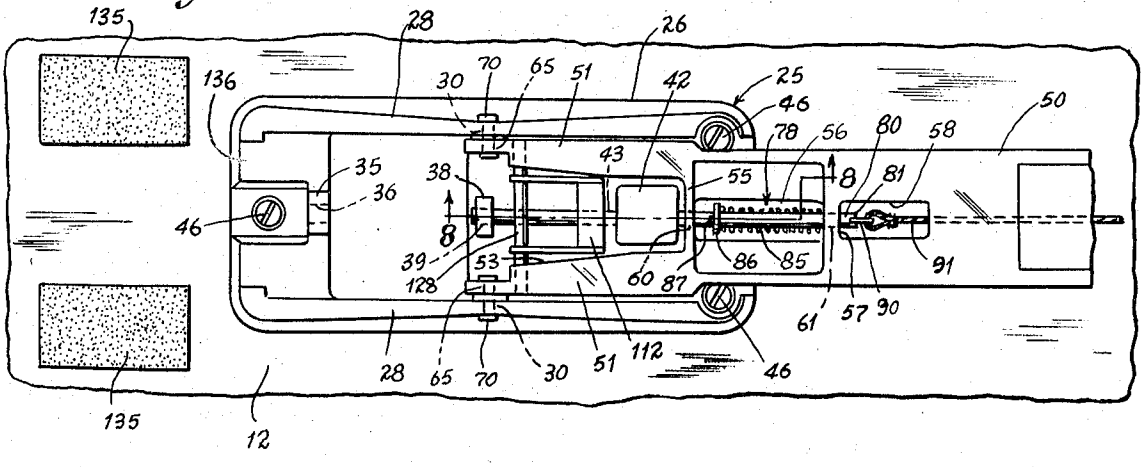


Fig. 3.

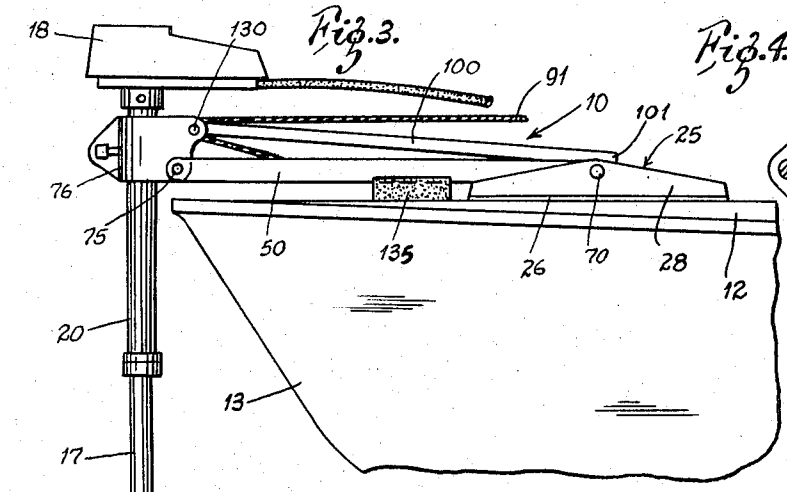


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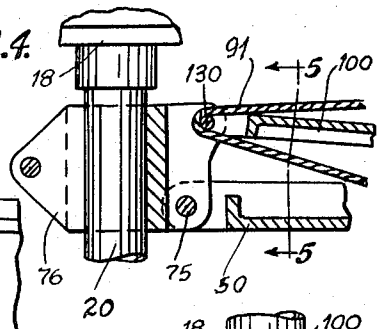


Fig. 5.

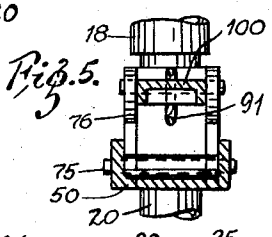


Fig. 7.

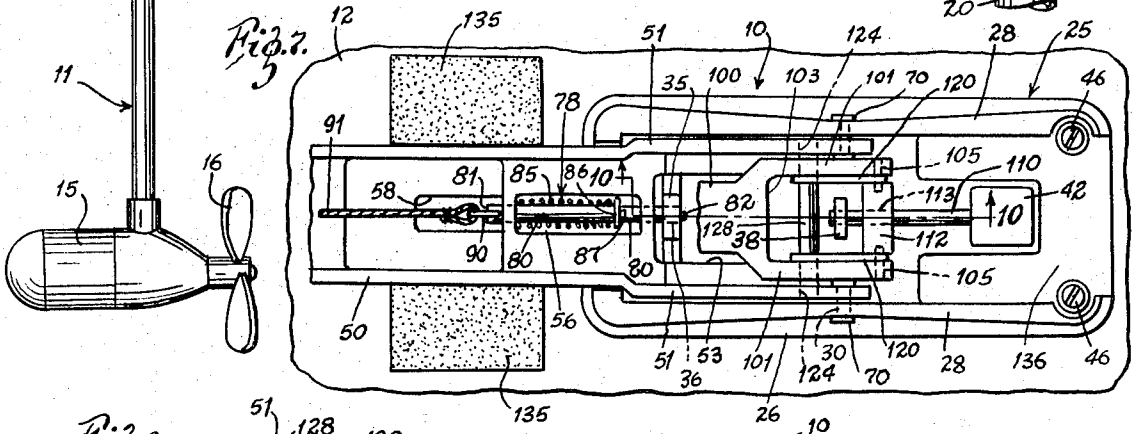


Fig. 8.

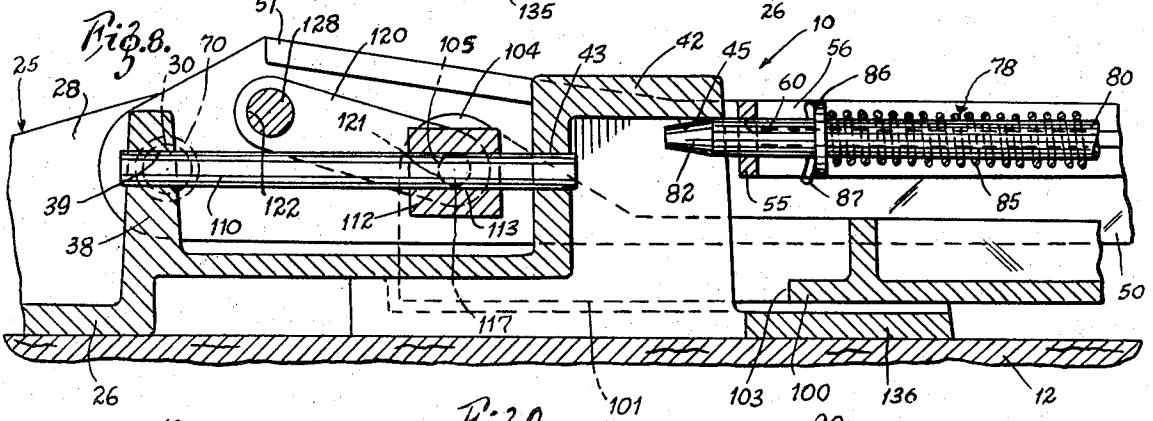


Fig. 9.

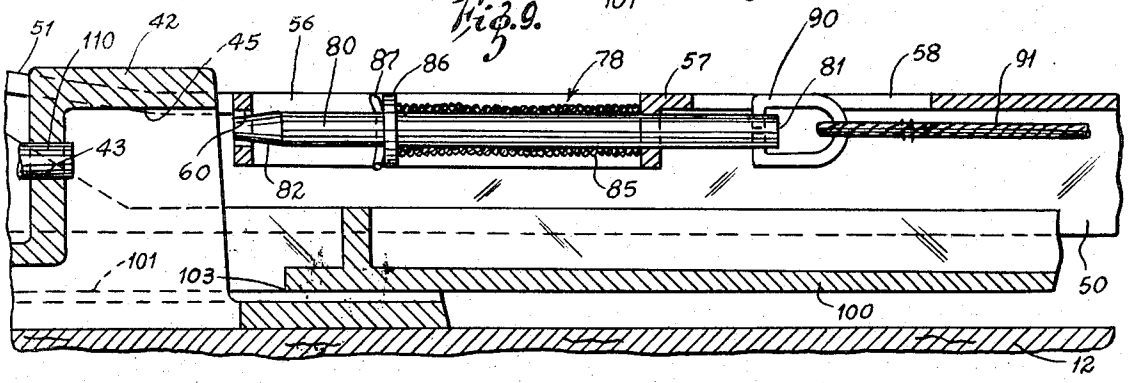


Fig. 10.

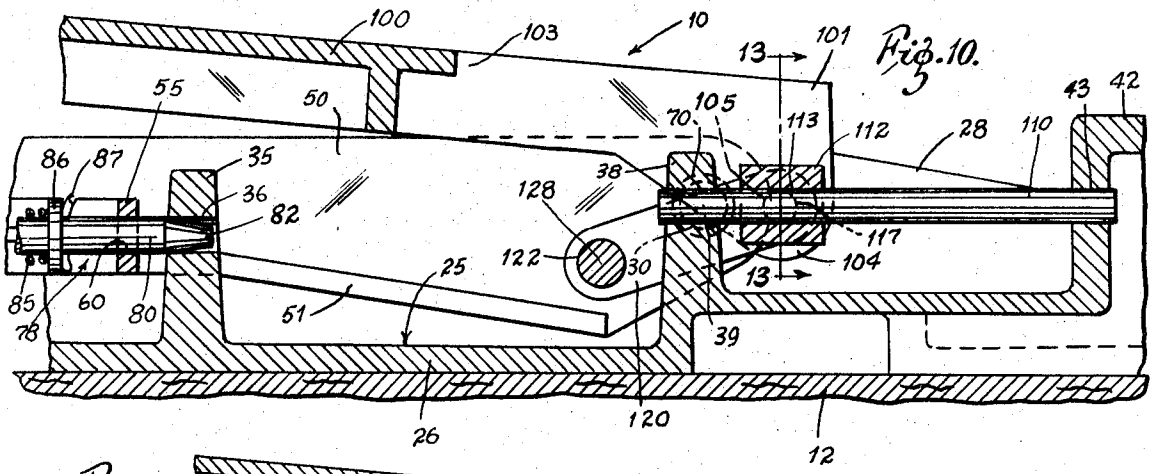


Fig. 11.

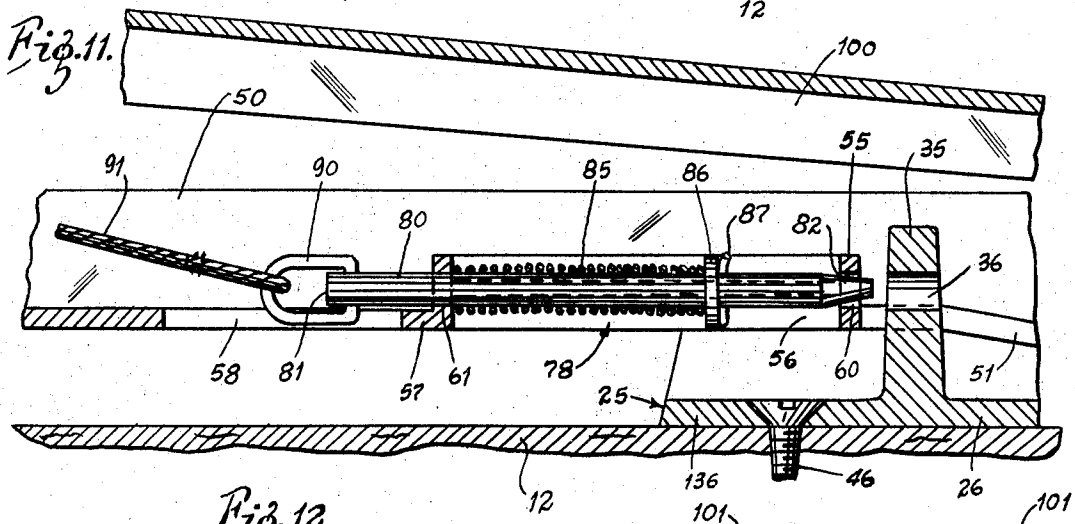


Fig. 12.

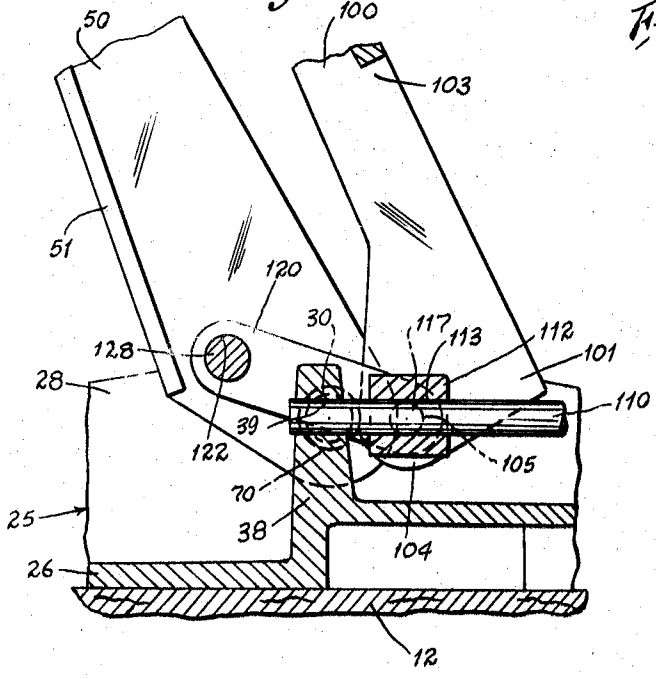
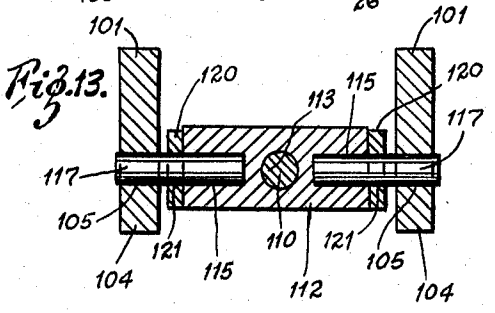


Fig. 13.



FOLDING ACCESSORY BRACKET ASSEMBLY

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a bracket assembly for use in mounting an accessory to a boat and particularly one that moves the accessory, such as a trolling motor or the like, between a vertical position in the water and a position generally parallel to and on top of a deck of the boat.

Bracket assemblies of this general type have long been used for mounting boat accessories such as trolling motors. Their usefulness lies in the fact that a fisherman will often have more than one motor on his fishing boat. For example, he may have a relatively large motor at the stern for powering the boat from one place to another as he moves between fishing locations, and a much smaller motor, which also may be mounted at the stern but is often mounted at the bow, for trolling while he is fishing at a particular location. While moving from one location to another it is necessary to pull the trolling motor out of the water which, during a particular fishing outing, usually occurs numerous times. For this reason means must be provided for handling this operation quickly and easily.

Various types of mounting brackets have been used for this purpose including those where the trolling motor is mounted to the end of a pivotal arm, the other end of which is pivotally mounted to a deck of the boat such as near the bow. Of these pivotal arm types some have required the use of pins that must be inserted when the motor is in the water and removed when stored on top of the deck so that the shaft of the motor will lie generally parallel to and on top of the deck. Others have included the use of ordinary parallel linkages which automatically control the attitude of the trolling motor to position it in this manner.

The difficulty with the first type bracket is that it requires the placement and removal of pins to effect proper attitude of the motor at the extreme positions which is time consuming and often aggravating to the fisherman. The difficulty with the second type bracket is that the parallel linkages have been known to bind after some period of use, probably due to wear at the pivot pins, which binding causes at least a temporary malfunction that can also be quite aggravating to the fisherman.

The bracket assembly of this invention automatically controls the attitude of the boat accessory, such as a trolling motor, as it moves between these extreme positions, while eliminating the difficulties of the other brackets presently known. The bracket assembly of the invention operates with exceptional smoothness and without binding, leaving the fisherman to concentrate on his fishing rather than worrying over operation of his trolling motor.

Generally, the bracket assembly of this invention comprises a mounting plate mounted to the deck of a boat such as near the bow. A first arm is pivotally mounted at its lower end to the mounting plate and pivotally mounted at its upper end to a suitable accessory bracket such as one for mounting to the bearing sleeve of a trolling motor shaft. A second arm is pivotally mounted at its upper end to the accessory bracket at a pivotal axis spaced from the pivotal axis of the upper end of the first arm. Means are provided for pivotally mounting the lower end of the second arm to a block,

which block is in turn slideably mounted to the mounting plate to allow movement back and forth. Linkage means are also pivotally mounted between the block and the lower end of the first arm, such that pivotal movement of the first arm imparts forward or rearward movement of the linkage means which in turn causes the block and therefore the lower end of the second arm to slide. This sliding movement of the block effectively changes the location of the lower pivotal axis of the second arm relative to the lower pivotal axis location of the first arm.

With proper dimensioning of the arms and linkages, and proper positioning of the various pivotal axes, the attitude of the motor is automatically controlled by the bracket assembly as it is operated between extended and retracted positions to move the motor between a position generally vertical in the water to a position generally parallel to and on top of the boat deck. This novel bracket assembly design produces an exceptionally smooth operating movement.

Also included are releasable means for locking the bracket in the extreme positions.

Hence, it is a primary object of this invention to provide a bracket assembly of the general type heretofore mentioned that automatically controls the attitude of the trolling motor as the bracket is operated between extended and retracted positions to move the motor between a position generally vertical in the water in the extended position and a position generally parallel to and on top of the boat deck in the retracted position, and to do so with exceptional smoothness of operation.

This and other objects of the invention will become apparent from the drawings and detailed description to follow.

DESCRIPTION OF THE DRAWING

FIG. **1** is a side elevation view of an accessory bracket assembly of this invention shown for mounting a trolling motor to a boat, the bracket assembly being shown in its retracted position;

FIG. **2** is a view similar to FIG. **1** but showing the bracket assembly between its extended and retracted positions;

FIG. **3** is a view similar to FIG. **1** but showing the bracket assembly in its fully extended position;

FIG. **4** is an enlarged view of the shaft bracket shown in FIG. **3** with parts shown in section;

FIG. **5** is a view in section taken generally along the line **5—5** of FIG. **4**;

FIG. **6** is a partial plan view of FIG. **1** showing the folding bracket in its retracted position and with the motor not shown for clarity;

FIG. **7** is a view similar to FIG. **6** but showing the folding bracket in its extended position;

FIG. **8** is an enlarged view in section taken generally along the line **8—8** of FIG. **6**;

FIG. **9** is a view similar to FIG. **8** but taken rearwardly thereof and showing the locking pin in its retracted position;

FIG. **10** is an enlarged view in section taken generally along the line **10—10** of FIG. **7**;

FIG. **11** is a view similar to FIG. **10** but taken forwardly thereof and showing the locking pin in its retracted position;

FIG. **12** is an enlarged view of the lower pivotal linkage of the folding bracket assembly as viewed in FIG.

2 but with parts shown in section for purposes of illustration; and

FIG. 13 is a view in section taken generally along the line 13—13 of FIG. 10.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to the drawing and initially to FIGS. 1, 2, and 3, there is shown a folding bracket assembly 10 of this invention for mounting a trolling motor assembly 11 to the forward deck 12 of a boat 13. It is to be understood that while the bracket assembly 10 is shown for mounting a trolling motor assembly to a boat, it may also be used to mount other boat accessories where it is desirable to provide a bracket means which automatically controls the attitude of the accessory between extreme positions. A trolling motor is certainly the primary accessory to which this invention relates. It is also to be understood that while the bracket 10 is shown mounted to the front deck of the boat, it could also be mounted at other locations such as a rear deck.

As with most trolling motor assemblies, the trolling motor assembly 11 includes a motor 15 having an impeller 16 rotatably mounted thereto, the motor 15 being mounted at the base of a shaft 17, at the top of which is mounted a housing 18 which contains suitable electrical leads to transmit power to the motor, steering mechanism, and the like for operation and steering the motor assembly. A bearing sleeve 20 surrounds the shaft 17 and includes bearings therein for rotation of the shaft 17 and hence the motor 15 and impeller 16 relative to the sleeve for steering the boat. The trolling motor assembly 11 thus described is of a type commonly known in the art, it being understood that other types of such motor assemblies could also be used such as those that are gasoline powered.

The bracket assembly 10 to which this invention is directed comprises a mounting plate 25 having a base member 26 and opposed vertical sides 28, having axial aligned apertures 30 therethrough about midway between the front and back of the plate 25. A vertical post 35 is located near the forward end of the plate 25 and has an aperture 36 therethrough. Another post 38, having an aperture 39 therethrough, extends vertically from the bottom of the plate 25 at approximately its center and a generally cubicle hollow housing 42 is located near the rear end of the plate 25 which extends vertically from the base 26 and has an aperture 43 through the front wall thereof. The back side of the housing 42 is open as best shown at 45 in FIG. 8. The apertures 36, 39, and 43 are in axial alignment and located preferably midway between the sides 28. The entire mounting plate 25 including the sides 28, posts 35 and 38, and housing 42 may, for example, be cast of aluminum, and is mounted to the deck 12 by any suitable means such as bolts 46.

A first arm member 50, which may for example also be of cast aluminum and of one-piece construction, is formed at its lower end with opposed bifurcated members 51 having an opening 53 therebetween. Spaced upwardly from the opening 53 and separated by a wall 55 is an elongated opening 56, and spaced upwardly from the opening 56 and separated by a wall 57 is another elongated opening 58. The wall 55 has an aperture 60 and the wall 57 has an aperture 61 therethrough (FIGS. 8 and 9). The apertures 60 and 61 are in axial alignment with the apertures 36, 39, and 43.

The lower ends of the bifurcated members 51 have axially aligned apertures 65 therethrough. Pins 70 extend through the apertures 30 and 65 to pivotally mount the arm 50 at its lower end to the sides of the mounting plate 25, thus allowing the arm 50 to pivot between a retracted position as shown in FIGS. 1, 6, 8, and 9, through the position shown in FIGS. 2 and 12, and an extended position as shown in FIGS. 3, 10, and 11.

The upper end of the arm 50 is pivotally connected by means of a pin 75 to a shaft bracket 76. The bracket 76 is shaped generally as shown in FIGS. 1 through 4 and may be of any suitable type, such as a split sleeve, for fitting tightly around the sleeve 20 of the motor assembly 11.

A locking pin assembly 78 is provided for locking the bracket assembly 10 in both its extended and retracted positions. The locking assembly 78 comprises a pin 80 extending through the apertures 60 and 61, the pin having a flat end 81 located in the opening 58 and a tapered end 82 extending in a release position into the opening 53 between the bifurcations 51. A coil spring 85 surrounds the pin 80 within the opening 56 one end of which contacts the wall 57 and the other end of which contacts a washer 86 which is held against a cotter pin or the like 87 extending through a diametrical aperture in the pin 80. A ring 90 extends through a diametrical aperture near the flat end 81 of the pin 80 to which is connected a release cord 91.

As best seen in FIGS. 6, 8, and 9, when the pin 80 is in its release position (FIG. 8) the tapered end 82 extends under the top wall of the housing 42 to lock the arm 50 and hence the entire bracket assembly 10 in the retracted position. With the pin 80 pulled against the spring 85, such as by means of the cord 91, the tapered end 82 is slid from beneath the top wall of the housing 42, as best shown in FIG. 9, so that the bracket assembly 10 can be pivoted to its extended position as shown in FIGS. 7 and 11. To lock the assembly in its extended position, the cord and hence the pin are released against the spring tension allowing the tapered end 82 to slide within the aperture 36 of the post 35 as shown in FIG. 10. In this manner the bracket assembly 10 can be locked in either position.

It will be noted that in this preferred embodiment, where the same latching assembly 78 is used to lock the bracket assembly in both positions, the lower pivotal axis of the arm 50 is midway between the rear edge of the housing 42 and the forward edge of the post 35. Also, the wall 55 should just clear the rear edge of the housing 42 with the bracket in its retracted position, and the front edge of the post 35 with the bracket in its extended position.

Running generally parallel to the arm 50 is another arm 100 which is slightly narrower than the arm 50 but like the arm 50 is formed at its bottom end in bifurcated members 101 with an opening 103 therebetween (FIG. 7). The lower ends of the members 101 are formed with ears 104 having axially aligned apertures 105 therethrough.

A rod 110 is mounted between the post 38 and housing 42 with one end of the rod extending through the apertures 39 and the other end through the aperture 43. A block 112 is slideably mounted on the rod 110, the rod extending through an aperture 113 in the block such that the block is free to slide along the rod between the post 38 and the housing 42. The block 112

also has apertures **115** at each of its ends which are normal to the aperture **113.**

The arm **100** is pivotally mounted at its lower end to the block **112** by means of pins **117** extending through the apertures **105** in the bifurcations **101** and the apertures **115** in the block **112.**

Parallel links **120** are located between the bifurcations **101** and the ends of the block **112** with the pins **117** extending through apertures **121** in the ends of the links. The other ends of the links **120** have apertures **122** which are axially aligned with apertures **124** (FIG. **7**) in the bifurcations **51** of the arm **50.** As best shown in FIGS. **8, 10,** and **12,** the apertures **124** are spaced slightly further from the lower end of the bifurcations **51** than the apertures **65,** and are offset somewhat from a center line drawn between the upper and lower pivotal axes of the arm **50.** The links **120** are pivotally mounted at their apertures **122** by means of a pin **128** extending through the apertures **124** in the bifurcations **51** and the apertures **122** in the links **120.**

The other end of the arm **100** is pivotally connected by means of a pin **130** to the shaft bracket **76** at a point spaced upwardly and rearwardly of the pivot **75** as viewed in FIG. **3.** In a preferred embodiment of the invention, the distance between the upper and lower pivotal axes of the arm **50** is equal to the distance between the upper and lower pivotal axes of the arm **100.**

Spaced pads **135** of rubber or other suitable material are secured to the deck **12** just forward of the mounting plate **25** and positioned such that the motor **15** rests thereon with the bracket assembly **10** in its retracted position as best shown in FIG. **1.** As shown in FIGS. **6** and **7,** support surfaces **136** are formed as part of the mounting plate **25.** These surfaces engage the lower surfaces of the arms **50** and **100** with the bracket assembly **10** in its extended and retracted positions, respectively, to support the bracket and motor assemblies in those positions.

OPERATION

From the foregoing it can be seen that the motor assembly **11** can be moved between a position with its shaft **17** generally vertical relative to the surface of the water and with the motor **15** and impeller **16** in the water to propel the boat, and a retracted position with the shaft **17** of the motor assembly generally parallel to and on top of the boat deck with the motor **15** resting on the pads **135.** This movement of the motor assembly is accomplished merely by lifting the motor against its weight from either of its two extreme positions, the bracket assembly **10** acting automatically by means of its pivot arms **50** and **100** and its linkages **120** to properly position the motor shaft at these positions.

To move the motor and bracket assemblies from their extended to their retracted positions, it is only necessary to pull the cord **91,** which extends from the pin **80** back over the pin **130,** thus sliding the pin **80** from within the aperture **36** and unlatching the bracket. Further tension on the cord **91** in a somewhat upwardly direction lifts the motor **15** out of the water in a rotating manner as caused by rotation of the arms and linkages of the bracket **11.** Specifically, as the motor is lifted out of the water, the arm **50** pivots at the pins **70** and **75.** As the arm **50** pivots, the linkages **120** begin to rotate counterclockwise as viewed in the drawings about the pin **128** which itself begins to move in an arcuate path from a position forward of the pivot pins **70** to a position rearward of the pins **70** when the bracket reaches its retracted position (FIG. **6**). As the pin **128** moves in this arcuate and rearward path between extended and retracted positions, the linkages **120,** which are pivotally connected about the pin **128** and which have their other ends pivotally connected to the block **112** along with the lower end of the arm **100,** move the block **112** and hence the lower end of the arm **100** rearwardly along the rod **110.** Hence, as the arms **50** and **100** rotate between extended and retracted positions, the lower end of the arm **100** moves rearwardly along the rod **110.** This rearward movement causes rotation of the shaft bracket **76** in a clockwise direction causing a similar rotation in the shaft **17.** As will be noted from FIGS. **1, 6,** and **7,** in this preferred embodiment the distance between the axes **70** and **117** is less than between the axes **75** and **130** in the extended position but greater than between the axes **75** and **130** in the retracted position.

With continued tension on the cord **91** the tapered end of the pin **80** passes by the rear edge of the housing **42** allowing the motor assembly to take the position shown in FIG. **1.** Releasing the cord **91** allows the tapered end of the pin **80** to extend beneath the top of the housing **42** as best shown in FIG. **8** to latch the assembly in the retracted position.

To place the motor assembly back in its extended position, the above-described operation is simply reversed.

First, the cord **91** is pulled to release the latch, the motor assembly **11** lifted upwardly and forwardly such as by the housing **18** until it can be held by means of the cord **91** at about the position shown in FIG. **2,** and then the motor is lowered, by holding tension on the cord **91,** to its extended position as shown in FIG. **3.** Releasing the cord **91** then latches the assembly in its retracted position with the tapered end of the pin **80** extending into the aperture **39** of the post **38** (FIG. **10**). As the motor assembly is moved from its retracted to its extended position, the lower end of the arm **100** moves forward with the block **112** to take the position shown in FIGS. **7** and **10.**

By offsetting the lower pivotal axis of the arm **100** by use of the ears **104,** and by making the arm **50** narrower than the arm **100,** the two arms remain more nearly parallel in the extreme positions without interference of one arm with the other, and the bottom surface of the arm **100** rests on the top of the base plate **26** to help support the motor assembly in its retracted position.

Various changes and modifications may be made in this invention, as will be readily apparent to those skilled in the art. Such changes and modifications are within the scope and teaching of this invention as defined by the claims appended hereto.

What is claimed is:

1. A bracket assembly for mounting a trolling motor assembly to the deck of a boat, the motor assembly including a motor adapted to depend in the water by means of a shaft, the motor being mounted at the lower end of the shaft, and for moving the trolling motor assembly between an extended position with its shaft generally perpendicular to the surface of the water and a retracted position with its shaft generally parallel to and on top of the deck of the boat, the bracket assembly comprising mounting means for mounting to the boat deck, a motor bracket for mounting around the shaft of the motor assembly, first arm means pivotally

connected at a first end to the motor bracket and pivotally connected at a second end to the mounting means, second arm means pivotally connected at a first end to the motor bracket, the pivotal axis of the first and second arm means at the motor bracket being spaced apart, means connected to the mounting means for pivotally and slideably connecting a second end of the second arm means to the mounting means, and means responsive to pivotal movement of the first arm means to slide the pivotal axis at the second end of the second arm means, the dimensions of the arm means and the locations of the pivotal axes being such as to control the attitude of the motor assembly shaft to be generally perpendicular to the surface of the water in the extended position and to be generally parallel to and on top of the deck of the boat in the retracted position.

2. The bracket assembly of claim **1** wherein the last-named sliding means further comprises linkage means connected between the first and second arm means.

3. The bracket assembly of claim **2** wherein the linkage means is pivotally connected at one end about the same axis as the second end of the second arm means, and at the other end about an axis parallel to and located between the axes of the first and second ends of the first arm means.

4. The bracket assembly of claim **3** wherein the pivotally and slideably connecting means further comprises a block, means for mounting the block for sliding movement along a path generally normal to the pivotal axes of the first arm at the mounting means, said second end of the second arm means being pivotally connected to the block for sliding movement therewith.

5. The bracket assembly of claim **4** wherein the block mounting means further comprises a rod, and means for mounting the rod to the mounting means with its longitudinal axes normal to the pivotal axes of the first arm means at the mounting means, the block being mounted to slide along the rod.

6. The bracket assembly of claim **1** wherein the first and second arm means pivot approximately 180° between the extended and retracted positions.

7. The bracket assembly of claim **1** including releasable locking means for locking the bracket assembly in the extended and retracted positions.

8. The bracket assembly of claim **7** wherein said releasable locking means further comprises a spring biased pin slideably mounted to an arm means and operable between a release position and a retracted position, and means associated with the mounting means for engaging the pin when operated to its release position with the bracket assembly in its extended and retracted positions.

9. The bracket assembly of claim **8** wherein said pin is oriented and mounted to slide along an axis generally parallel to the arm means to which it is mounted, and wherein said engaging means associated with the mounting means further comprises members having apertures therein and through which the pin extends in its release position.

10. The bracket assembly of claim **1** wherein the mounting means includes surfaces against which the arm means rest in the extended and retracted positions.

11. The bracket assembly of claim **1** wherein the pivotal axis at the second end of the second arm means is closer to the pivotal axis at the second end of the first arm means with the bracket assembly in the extended position than with the bracket assembly in the retracted position.

12. The bracket assembly of claim **6** wherein the distance between the pivotal axes at the second ends of the arm means is less than the distance between the pivotal axes at the first ends of the arm means with the bracket assembly in its extended position, and the distance between the pivotal axes at the second ends of the arm means is greater than the distance between the pivotal axes at the first ends of the arm means with the bracket assembly in its retracted position.

13. A bracket assembly for mounting a trolling motor assembly to the deck of a boat, the motor assembly including a motor adapted to depend in the water by means of a shaft, the motor being mounted at the lower end of the shaft, and for moving the trolling motor assembly between an extended position with its shaft generally perpendicular to the surface of the water and a retracted position with its shaft generally parallel to and on top of the deck of a boat, the bracket assembly comprising mounting means for mounting to the boat deck, a motor bracket mounting around the shaft of the motor assembly, first arm means pivotally connected at a first end to the motor bracket and pivotally connected at a second end to the mounting means, second arm means pivotally connected at a first end to the motor bracket, the pivotal axis of the first and second arm means at the motor bracket being spaced apart, a third arm means, means for pivotally connecting one end of the third arm means about an axis parallel to and located between the axes of the first and second ends of the first arm means, means at the mounting means for pivotally mounting the second end of the second arm means and the second end of the third arm means about the same pivotal axes and for sliding movement along a path generally normal to the pivotal axis of the first arm means at the mounting means, the distance between the pivotal axes at the second ends of the first and second arm means being less than the distance between the pivotal axes at the first ends of the first and second arm means with the bracket assembly in its extended position, and the distance between the pivotal axes at the second ends of the first and second arm means being greater than the distance between the pivotal axes at the first ends of the first and second arm means with the bracket assembly in its retracted position, the dimensions of the arm means and the locations of the pivotal axes being such as to control the attitude of the motor assembly shaft to be generally perpendicular to the surface of the water in the extended position and to be generally parallel to and on top of the deck of a boat in the retracted position.

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