United States Patent

Murphy

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[54] **MULTI-PURPOSE BOAT FENDER**

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[51] **Int. Cl.** **B63b 29/02**

[58] **Field of Search** ..114/219, 122, 123, 126; 9/400, 9/1 R

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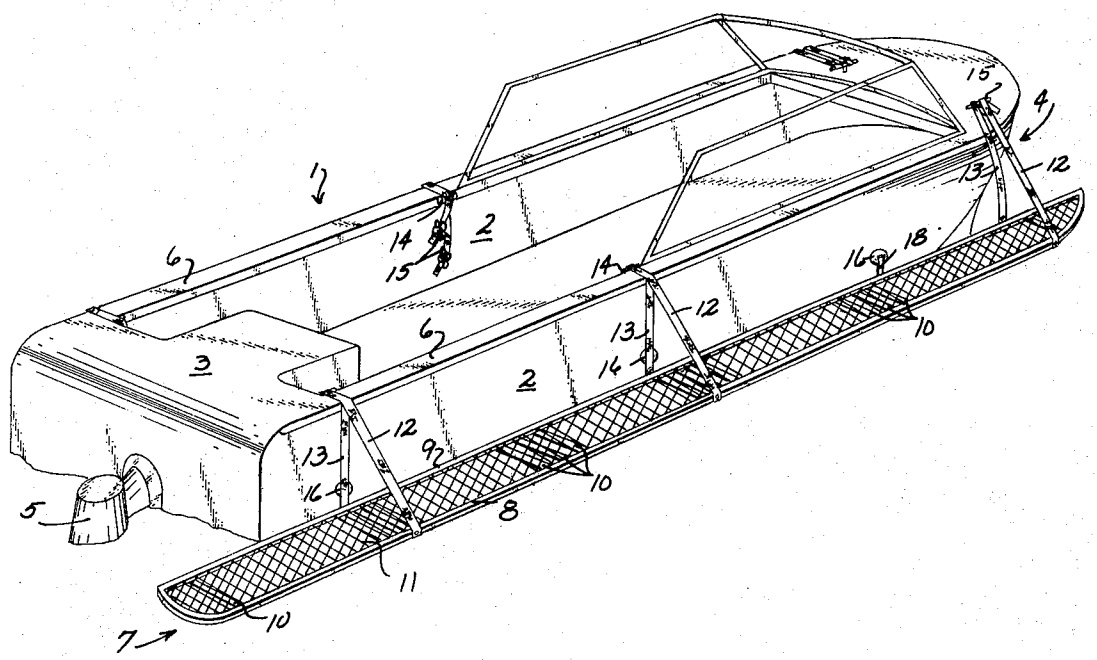
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[57] **ABSTRACT**

A boat hull has an elongated, flat platform suspended by straps from the gunwale to serve as a fender along the outside surface of the hull sides. The fender has suction cups which releasably hold it to the hull and with the straps support the platform in a horizontal position. The suction cups are hinged to the inside longitudinal edge of the platform so that the platform can be swung upwards to a vertical position. Additional platforms can be provided for the stern and bow of the boat and extendable rods can be connected between various platforms and the suction cups to adapt the assembly for use with various hull shapes.

8 Claims, 8 Drawing Figures



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SHEET 1 OF 2

Fig. 1

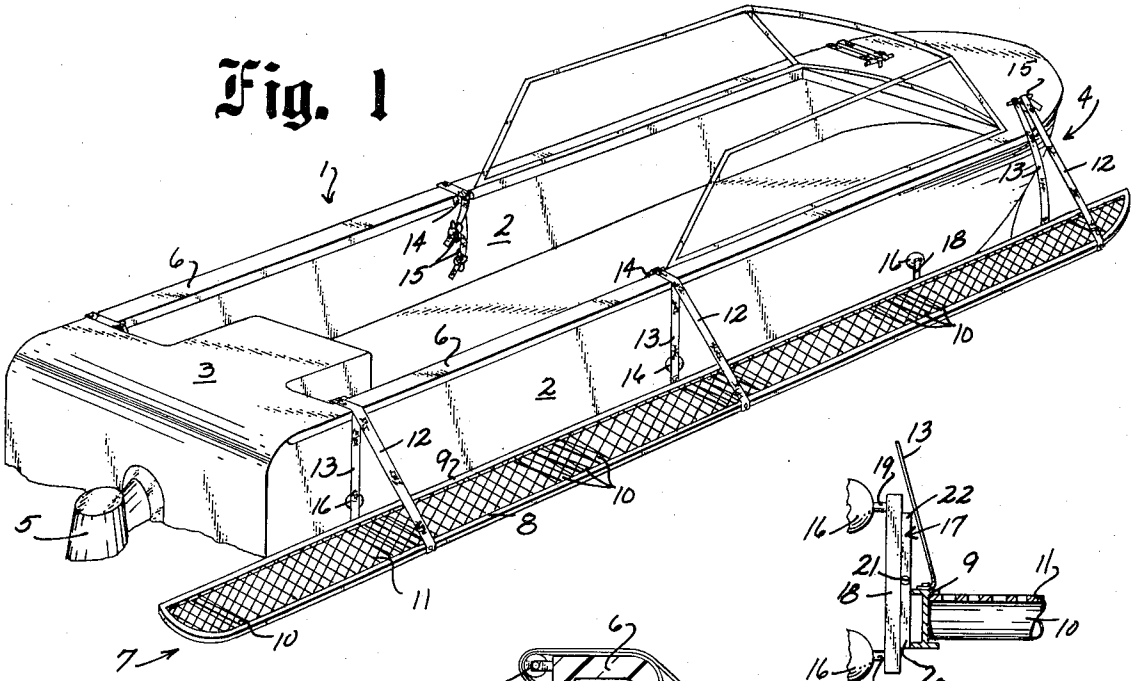


Fig. 4

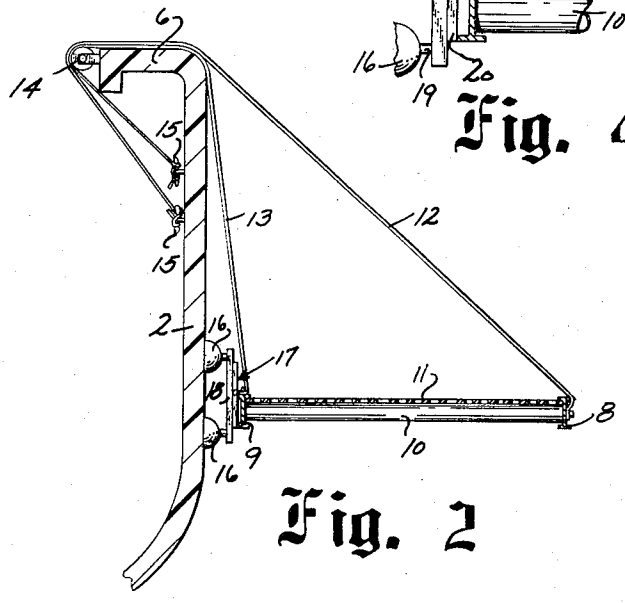


Fig. 2

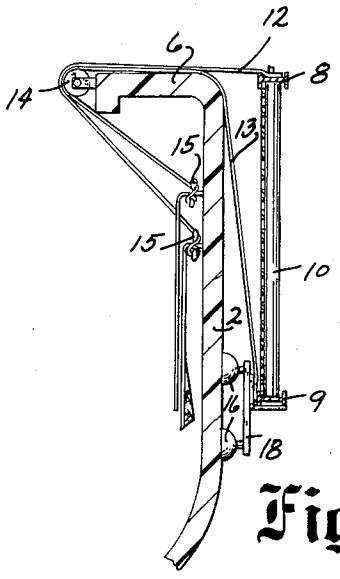


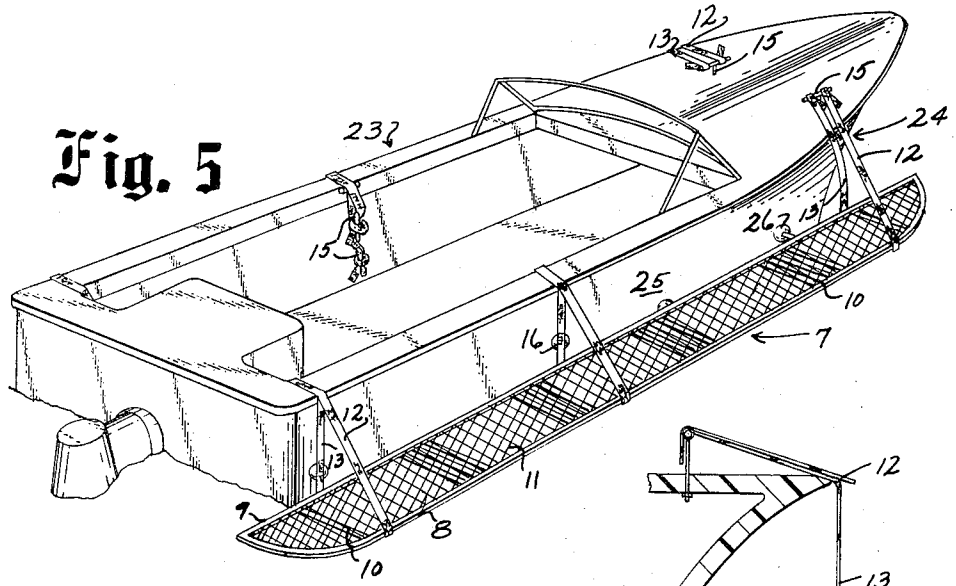
Fig. 3

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Fig. 5



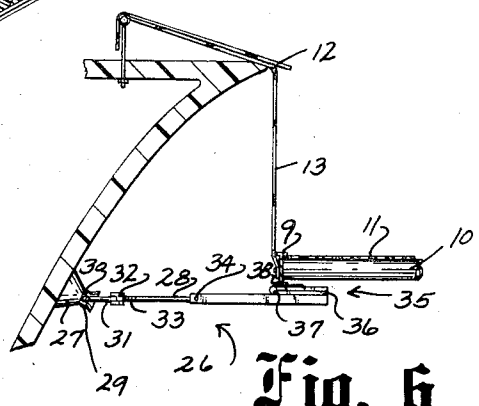


Fig. 6

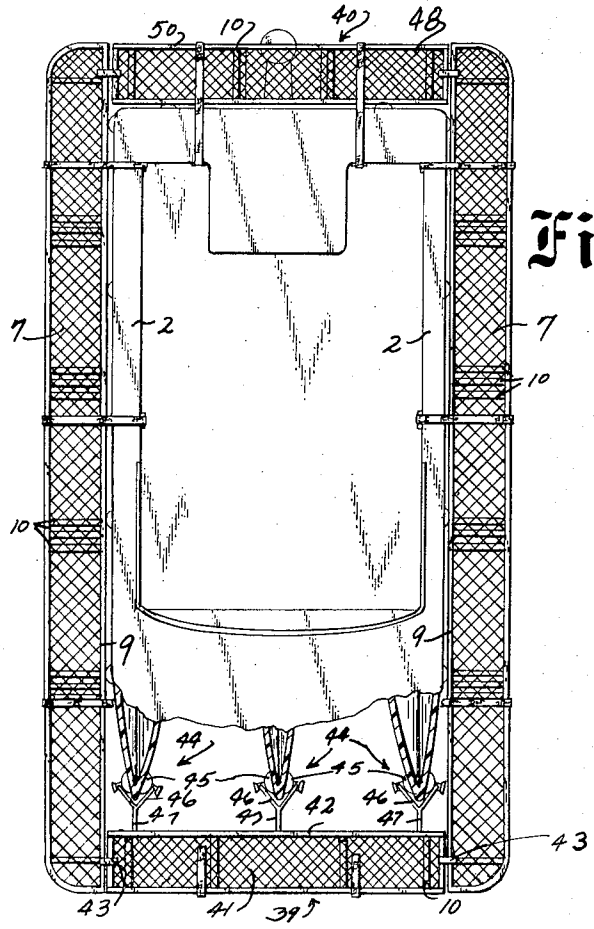


Fig. 7

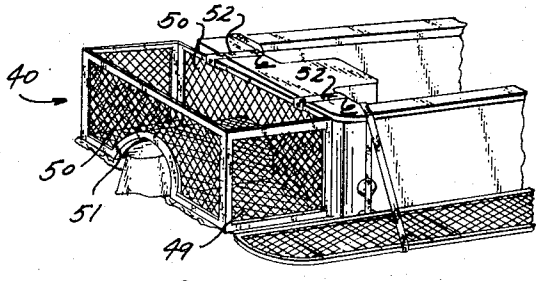


Fig. 8

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MULTI-PURPOSE BOAT FENDER

BACKGROUND OF THE INVENTION

This invention relates to accessory attachments for small boats and in particular to outboard accessories such as fenders, platforms, storage devices, and the like.

Small boats are generally designed for particular sporting tastes, with some boats adapted more for cruising and water skiing, other boats designed for fishing, and others made primarily for houseboat use. The design features for one use often conflict with desirable designs for the other uses. For instance, cruising boats are generally too deep for comfortable fishing, and boats which can be conveniently employed as houseboats are too large for cruising with moderate sized engines. A need thus arises for accessory equipment which can add versatility to the boat hulls.

SUMMARY OF THE INVENTION

The concept of the invention is to provide this versatility in small boats with accessory platform attachments that do not hinder the operation for which the hull was designed. Lesser advantages to the invention are apparent in the description and drawings.

The accessory platforms of the invention function in numerous ways, but are here conveniently termed boat fenders. The boat fenders have elongated, flat and rigid platforms which extend horizontally along the outer surfaces of one side, both sides, the bow, the stern, or any desired combinations of these hull sections. Each fender is suspended by adjustable means from an available part at the top of the hull, such as the gunwale, so that the vertical position of the fender can be easily changed for different uses.

Suction cups secured along the inside edge of the fender further support the fender of the hull, and are releasable for adjustment or removal of the accessory. For curved or V-hulls, the suction cups have, in addition, extendable support members which extend between the cups and the fender where the hull curves inward, so that the fender platforms can be swung to a vertical position, as when the boat is cruising or being transported overland. The suction cups are hingedly connected to the fender or to the extendable members where appropriate.

The fenders can be formed in as many sections as desired, and can extend around the hull or any desired portion. Thus, one section could be employed on a side of a hull and adjusted to different heights for use as an outboard swimming deck, a walkway, a storage area, an outboard fishing deck, or simply as a bumper and docking assistant. Vertical sides can be added to the fender section at the stern to provide more storage area.

These features are provided by a simply constructed, inexpensive and easily removable boat fender construction which is adaptable to any type of hull.

The drawings illustrate several embodiments of the invention and illustrate the best mode presently contemplated for carrying out the invention.

In the drawings:

FIG. 1 is an isometric view of a fender in use on a trihedral hull boat;

FIG. 2 is an enlarged partial section of the boat in FIG. 1 taken through one side of the hull;

FIG. 3 is a second partial section like that of FIG. 2, with the fender of the invention in a second position;

FIG. 4 is an enlarged view of the hinge and suction cup of FIG. 2;

FIG. 5 is an isometric view of a fender in use on a V-hull boat;

FIG. 6 is an enlarged partial section of the boat in FIG. 5 taken near the bow;

FIG. 7 is a top view of a trihedral hull boat with additional fenders attached, part of the boat being sectioned; and

FIG. 8 is an enlarged isometric view of the stern portion in FIG. 7.

DESCRIPTION

The drawings, and particularly FIG. 1, illustrates a trihedral type of hull 1, with generally straight, hull top sides 2 joined to a flat stern 3 and a trihedral prow 4. As an example of one type of boat which can employ the apparatus of the invention, hull 1 has a stern drive unit 5, and a forward cockpit section with any conventional deck construction. A gunwale 6 is provided around the top of the hull as in a conventional design. This boat and hull type is designed primarily for cruising or water skiing.

In accordance with the invention a boat fender section 7 is an accessory attachment for one side 2 of the hull. Fender section 7 is an elongated, flat platform extending from beyond stern 3 to prow 4 along the outside of the hull, above the water line, and with the flat side lying generally horizontally.

For lightweight but rigid construction, fender section 7 has an outer frame 8 curving around the outside edge of the structure, a linear inner frame member 9 on the inside edge, and intermediate frame members 10 which may be tubular members extending laterally between frames 8 and 9. A flat platform body 11 of expanded metal, such as aluminum, is welded to frames 8, 9 and 10 to complete the platform structure of the fender. The entire fender could be made of other suitably rigid materials, such as reinforced plastic.

Fender section 7 is adjustably and removably supported on gunwale 6 by support means, being shown as a set of outer straps 12 and inner straps 13 which are secured respectively to outer frame 10 and inner frame 9. Straps 12 and 13 are flexible and are preferably fabricated from waterproof material such as nylon. The straps extend from the longitudinal edges of fender section 7, over gunwale 6 and over pulleys 14 which may be provided on the inside edge of gunwale 6, or any other available deck space such as on the deck at the bow. Straps 12 and 13 may be drawn over pulleys 14 to corresponding pairs of cleats 15 attached to the inside of boat side 2 beneath respective pulleys or attached directly to similar cleats as shown at the bow. A pair of straps 12 and 13 is operated over each pulley 14 and similarly tied on each pair of cleats 15. Raising and lowering the entire fender section 7 is accomplished by hauling in or feeding out the straps and tying them over the cleats when the fender is at the desired level.

The straps or other flexible support means are advantageous in that they are easy to handle, do not tend to scratch the boat, and are inexpensive. Soft cords and suitable cleats could replace the pulley and cleat arrangement with the same advantage. In the optimum

practice of the invention, flexible means would therefore be preferred. However, other suitable support means, such as telescoping rods, metal straps, cords and the like could be used for supporting and adjusting the level of fender 7.

Further in accordance with the invention, fender sections 7 are releasably attached to the outside surface of side 2 by sets of suction cup pairs 16. Cup sets 16 are spaced along the hull and connected to inner frame 9 of the fender with the open ends of the cups releasably attached to the hull in service. For the invention, the cups can be any common suction cup construction, and should be fabricated from relatively durable resilient material, such as rubber or various synthetic plastic materials.

The connections between cups 16 and fender section 7 are designed to permit the fender to swing upward relative to the cups and the hull. For this purpose, hinge assemblies 17 are secured to fender 7 and to a brace plate 18. Plates 18 are attached to the cups by any conventional means such as pins 19 and hold one cup of the set above frame 9 and one cup below the frame. To complete the assembly, hinge 17 has a swingable hinge plate 20 swingably attached by a conventional hinge pin assembly 21 to a plate 22. Plate 20 is attached to inner frame member 9 while plate 22 is secured to plate 18. By this construction, a hinge assembly is provided that secures suction cup set 16 to fender section 7 and permits the fender to swing upward relative to the cup.

Thus, when the boat is cruising, being transported overland, or being stored, fender section 7 can be swung to a vertical position along boat side 2 by hauling in on outer straps 12. The fender rotates upward by hinge assemblies 17 about cups 16 and the outer straps are tied short to secure the structure along the hull. If the level of the fender is to be changed, for instance, to lower it nearer the water line for swimming use, suction cups 16 are released and both sets of straps 12 and 13 are let out and retied in the new position while the cups are reattached. Similar adjustments can be made to position the fender at any level on the hull, and as well, the entire fender assembly can be removed from the boat by untying the straps and releasing the suction cups.

Illustrated in FIGS. 5 and 6, the invention is adapted for use with a V-hull boat 23. Similar parts being identified by the identical numbers of FIGS. 1–4 in the present FIGS., platform body 11, with frame members 9 and 10 and straps 12 and 13 and their attendant assemblies are the same as previously described in the first embodiment.

As in the conventional, small boat, hull 23 has a V-shaped prow 24 with the hull widening and flattening on the bottom to have top sides 25 which are generally vertical from midway of the length of the hull to the stern.

Fender section 7, as adapted for hull 23, extends from the stern along a side 25 beyond the midpoint to where the bow curvature becomes more severe. At the fore portion of platform 7, inside frame member 9 is thus spaced further from the hull due to the curvature of the hull. For this reason, while suction cup assemblies 16 like those for the tri-hull fender are employed from midway of the length of the stern, extendable suction cup assemblies 26 are provided for the fore section of fender 7 for use with hull 23.

Seen best in FIG. 6, each of these suction cup assemblies 26 includes a cup 27 similar to cups for sets 16, and a telescoping rod 28 which is attached to a cup neck 29 by a collar 30. Collar 30 has clevis legs 31 extending on both sides of the neck to a female coupling 32 having a bore in the outside end to receive a threaded end 33 of rod 28.

Rods 28 are metallic and should have sufficient strength to resist bending in use, although the major support for platform 11 is provided by straps 12 and 13. The rods have telescoping sections with a set screw 34 in the outer section for tightening against the inner section and thus determining the extension of the rod.

To permit platform 11 to be pivoted upward, the outer end of each rod 28 is connected to inner frame member 9 by means of a hinge 35. The outer end of a rod 28 extends beneath frame member 9 where a lower hinge plate 36 is welded to the rod. Lower plate 36 is connected by a hinge pin 37 to an upper hinge plate 38 which is bolted or welded to the underside of member 9, completing the hinged connection. With this construction, the suction cup can be maintained in its attached portion with the hull, while platform 11 is pivoted to a vertical position about the hinge assemblies associated with cups 27. The fender of the invention is thus adapted for use with a V-shaped hull or other sloped hull shapes.

Referring now to FIGS. 7 and 8, the concept of the invention is shown adapted for use around the full periphery of a small boat hull. The invention is illustrated by example with the trihedral type hull 1 shown in the embodiment of FIGS. 1–4. Suitable modifications in shape and assembly, in accordance with the example above, can be made to adapt the fender for similar use about different shaped hulls.

In accordance with the invention, fenders are provided around the sides, bow and stern of hull 1, with two side fender sections 7 disposed from bow to stern on both sides 2, a bow fender section 39 across the bow, and a boot section 40 at the stern. The fender section 7 has previously been described in connection with the first described embodiment and will not be further described here. The addition of an additional side section and the bow and stern sections serve to convert a cruise hull 1 into houseboat type use, with walkway and storage area about the full periphery of the hull. Similarly, the additional sections may be adjusted vertically or folded against the hull for other uses, as for cruising, and they may be removed easily.

For these purposes, bow fender section 39 has an elongated rectangular platform body 41 that extends between the inner frame members 9 of the side sections. Supporting body 41, a rectangular frame 42 extends around the edges of the fender and connects by suitable releasable fasteners 43 to frame members 9. Additional straps 12 and 13 and cleats 15, similar to those described for the side fenders 7, further support bow fender section 39.

To releasably secure section 39 to the three hull sections at the prow, a suction cup assembly 44 is provided for each hull. Each assembly 44 includes a pair of suction cups 45, similar to cups 27, that are supported by a yoke 46 and are attached to opposite sides of each hull section. Yoke 46 is secured to the cups 45 similarly to the connection of cups 27 to their rods 28, and will not be detailed further. Because the three hull sections

slope inwardly toward the water line, an extension rod **47** is provided between frame **42** and yoke **46**. A rod **47** may be similar to rods **28** secured by welds or other suitable means to the outer end of a yoke **46** and extend to frame **42** where the rod is hingedly connected to bow section **39** similarly to rods **27**. This construction enables the bow fender section **39** to be adjusted, removed and swung upward as are the side sections **7**, thus, adapting the concept of the invention for use at the bow.

Referring again to FIG. **8**, stern fender section **40** is designed mainly for storage, and in addition to a horizontal platform **48** includes box sidewall **49** and end walls **50** which provide an open top, storage boot for the hull. The boot section is designed, in this example, for use with a flat stern, stern-drive cruiser, and thus has a central hump **51** in platform **48** to avoid stern drive unit **5**. Similar designs would adapt a boot section for an outboard boat. Platform **48** and walls **49** and **50** may be constructed of expanded metal and are rigidly attached to each other as by welds. The inside end wall **50** is secured to the stern at its top by suitable, removable C-clamps **52** attaching to the frame of wall **50** and over the stern gunwale **6**. Additional support could be provided by connecting turnbuckles, not shown. Another set of suction cups **53** are secured to the frame of platform **48** and hold the boot section **40** to the stern. No hinged connections are required for this example of a fender, as it is used more for storage and is above the water line to be disposed out of the way during cruising.

Boot section **40** is attached to side sections **7** by means of another set of suitable releasable fasteners **53** extending between platforms **11** and **45**. Thus, hull **1** is provided with multipurpose fender attachments about the full periphery of the boat.

OPERATION

In operation, each of the fender sections may be utilized alone or in combinations as desired, since they are easily removed. Additionally, the side fenders may be shorter than the full length of hull if less bulk is desired as against the convenience of use for a full length fender.

The fenders, or the sections which are desired, may be attached to the boat at dock or when beached, and the side or bow sections secured in the horizontal or extended position may be used in boarding the boat. At a dock, the suction cups may be located at the dock level, and the straps **12** and **13** tightened to dispose the platforms horizontally at dock level. The fenders may be swung to the vertical position after boarding, to permit cruising at normal speeds.

At the boater's destination, the fenders may again be moved to their extended positions and adjusted to the desired height above the water line, by the previously described manipulations of the suction cups **16** and **45** and straps **12** and **13**. If it is desired to continue cruising, as for water skiing, it is preferred to adjust the fenders at a level to clear the water as the hull planes. Other height adjustments for other uses will be made according to the preference of the users.

The fender section **7** may also be carried in the boat until a destination is reached. Then the straps **12** and **13** may be tied, the fender lowered to the desired height and the suction cups set by standing on the platforms **11**.

Thus, the practice of the invention adds versatility to common boat hulls which were designed for particular uses, while maintaining the hull performance as designed. The fenders of the invention are, in addition, themselves versatile, being used at different heights as walkways, swimming platforms, storage areas, fishing platforms or water skiing decks.

The several embodiments disclosed are examples of the various modes of the invention, and the following claims distinctly claim and particularly point out the subject matter which is regarded as the invention.

I claim:

1. A fender apparatus for attachment to the hull of a small boat, comprising:

an elongated platform being adapted to extend along an exterior portion of the hull;

vertically adjustable support means secured to said platform for suspending said platform at selected vertical levels from the hull; and

a plurality of suction cup assemblies spaced along the length of said platform and adapted to releasably attach said platform to the hull; each suction cup assembly including a support bracket and at least one suction cup mounted on the bracket and adapted to releasably engage the hull, and hinge means connecting each bracket to the platform, whereby the platform is pivotable relative to the hull between a generally vertical storage position and a generally horizontal operating position.

2. The apparatus of claim **1** and including extendible means interconnecting the cup assemblies with the platform for spacing said platforms from the hull.

3. The apparatus of claim **1** wherein said platform has a linear inner edge and is adapted to extend along the side of the hull with the inner edge disposed beneath the gunwale; and including extendible members connected to the platform and supporting said suction cup assemblies, whereby said platform is supported on said hull beneath the gunwale.

4. The apparatus of claim **1** wherein said platform is constructed of expanded metal.

5. The apparatus of claim **1** wherein said support means is releasably attached to the hull.

6. The apparatus of claim **1** wherein said support means are extendible whereby said platform is vertically adjustable relative to said hull.

7. The apparatus of claim **1** wherein said support means includes a set of inner support members and a set of outer support members connected to the respective inside and outside longitudinal sides of said platform, said inner and outer support members being supported by the gunwale of the hull in service.

8. The apparatus of claim **1**, wherein each suction cup assembly comprises a pair of vertically spaced suction cups, the upper of said suction cups being located at a level above the hinge means and the lower of said suction cups being located beneath the level of said hinge means.

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