United States Patent [19]

Gale et al.

[11] **3,869,742**

[45] **Mar. 11, 1975**

[54] **LADDER AND MOUNTING FOR SMALL BOATS**

[75] Inventors: **William F. Gale,** Box 11a, River Rd., Wapwallopen, Pa. 18660; **James Douglas Thompson,** Berwick, Pa.

[73] Assignee: said Gale by said Thompson

[22] Filed: **Feb. 28, 1974**

[21] Appl. No.: **446,768**

[52] **U.S. Cl.** ..... **9/1 R,** 182/189

[51] **Int. Cl.** **E06c 1/36**

[58] **Field of Search** ..... 9/1 R; 114/.5 R; 182/93, 182/100, 189, 206

[56] **References Cited**

UNITED STATES PATENTS

2,187,633	1/1940	Smith	9/1 R
2,924,291	2/1960	Tunstead	182/189
3,512,608	5/1970	Huntley	182/189

Primary Examiner—Trygve M. Blix
Assistant Examiner—Jesus D. Sotelo

[57] **ABSTRACT**

A single shaft ladder for use particularly by SCUBA divers in boarding small boats and a mounting bracket for mounting the ladder in angularly inclined relationship to the transom of a small boat with a top end portion of the ladder extending above and inwardly of the transom and with a bottom end portion extending in a downwardly divergent direction with respect to the transom into the water. The ladder has sets of opposite, laterally extending rungs spaced along the bottom portion of the ladder and a single rung extending laterally from one side of the upper portions of the ladder adjacent its top end to provide a handle for the person boarding the boat.

6 Claims, 6 Drawing Figures

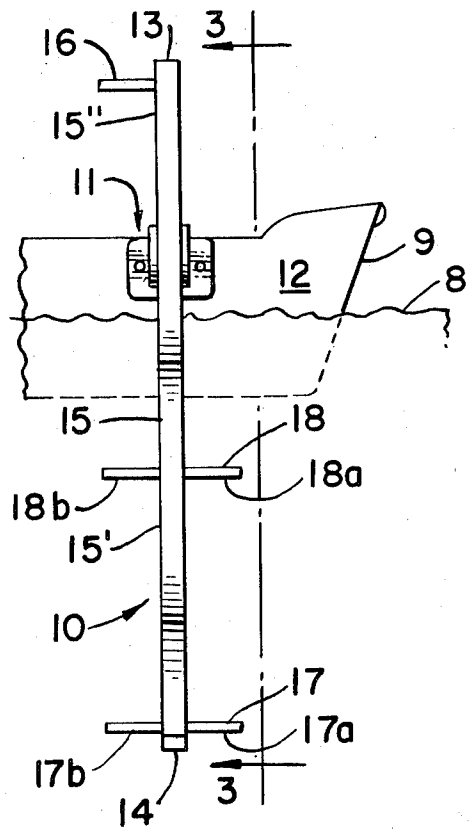


FIG. 1.

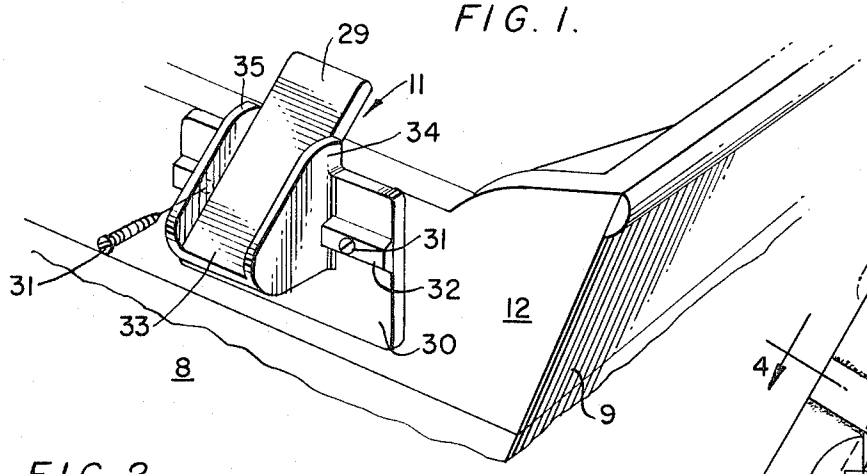


FIG. 3.

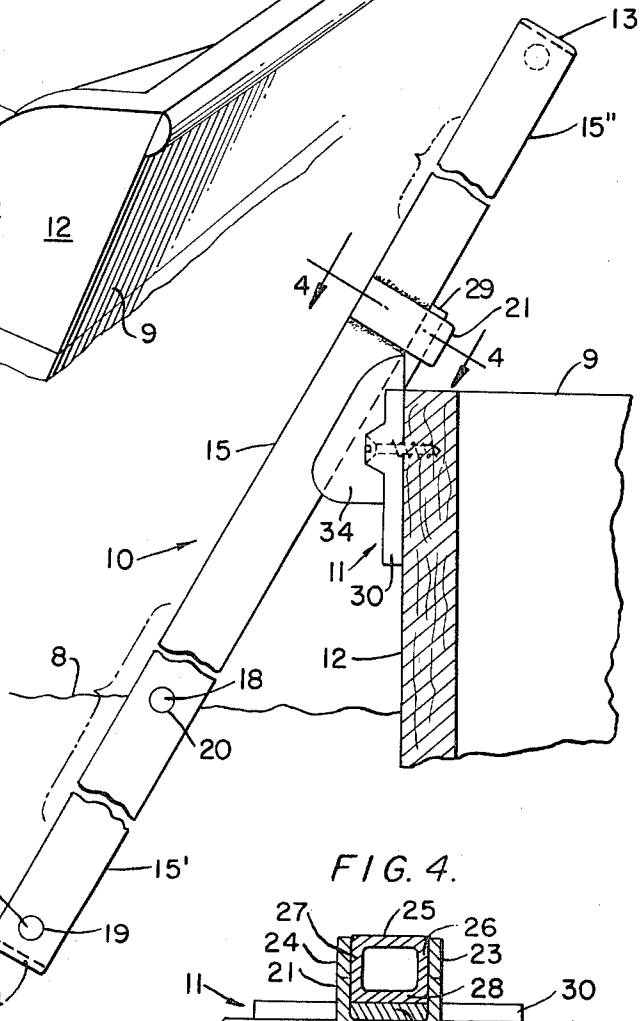


FIG. 2.

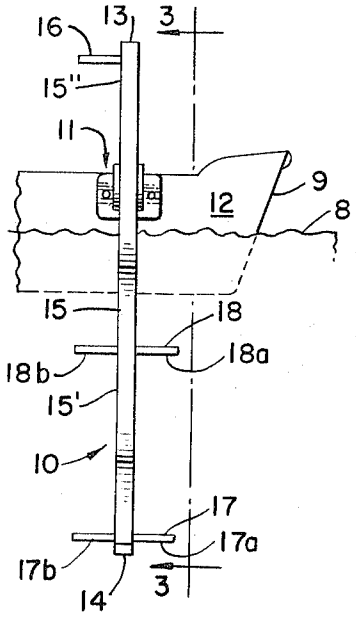


FIG. 4.

FIG. 5.

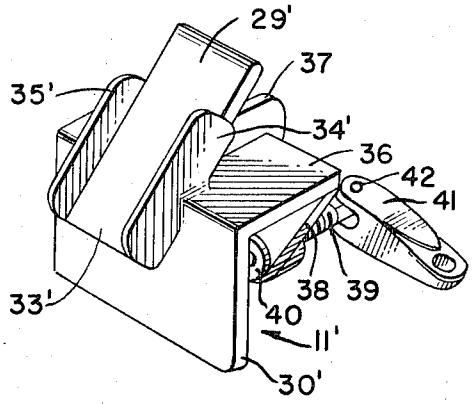
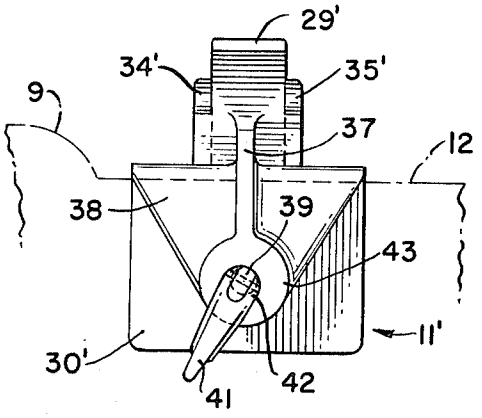


FIG. 6.



LADDER AND MOUNTING FOR SMALL BOATS

BACKGROUND OF THE INVENTION

The invention relates to an improved ladder and bracket for mounting the ladder on the transom of a small boat.

Biological sampling by SCUBA divers is well established in marine biology and is gaining importance in freshwater habitats. In small lakes and rivers, the diver often works from small boats with sides and transoms too shallow to accommodate commercially available ladders, designed for larger boats. Modification of conventional ladders to fit small boats would not be worthwhile, because the ladders are poorly designed for SCUBA divers use. Conventional ladders, closed on both sides by rung support shafts, are difficult to climb wearing cumbersome rubber fins; also, the ladders hang too close to the boat to provide sufficient "toe" space. Without a ladder, the diver must crawl over the side or the transom of a small boat to re-enter. Re-entry is difficult in icy, turbulent water, especially when laden with 45 to 60 kg of air tanks, weight belt and miscellaneous gear (gear removed in the water is often lost). After struggling into the boat, the diver sometimes loses balance and sprawls forward, amidst samples and gear in the bottom of the boat.

SUMMARY OF THE INVENTION

By using the ladder described here a fully-equipped diver can re-enter a small boat with dignity and ease, even in strong currents. The ladder's most important features are its single shaft ("open step" design), thus lack of side supports, its slope and its location on the boat. While wearing rubber fins, it is difficult for the diver to feel objects such as ladder rungs in front of his feet to determine their position. With the "open step" it is easy for the diver to bring his feet to the ladder from the side; he can use the inner sides of his feet (where the rubber fins do not project outward) to locate the ladder rungs. Ladder slope is important, for if the angle between the shaft and the transom is 35° to 40°, there is ample space for the diver's fins; this slope also allows the diver to lean forward while ascending, thereby eliminating the strain of the air tanks on his shoulders. Location of the ladder on the transom (the strongest and best supported part of the boat) is particularly important in rivers because: (1) the boat partially protects the diver from the current and (2) the diver can climb out of the water parallel to the current. With conventional ladders, on the side of the boat, the current twists the diver sideways as he tries to climb and sweeps his feet downstream.

The ladder extends about 75.0 cm below the water's surface to allow the diver to swim onto it. The lower rung provides a convenient "in-the-water" resting site where the diver can kneel or stand. The ladder has a handle only on the side next to the motor so that the diver can pass unhampered on the other side. Boats with very narrow transoms can be operated with the outboard motor slightly off-center to provide extra space for the diver and ladder. The ladder is removed from its bracket before the outboard motor is placed into gear; the ladder is completely sealed and floats if dropped into the water.

It is thus an object of the invention to provide an improved single shaft ladder and bracket for mounting the ladder on the transom, or side of a small boat. The

bracket includes a butt plate for abutting the transom, means for securing the butt plate adjacent the top edge of the transom, and a bed plate for supporting the ladder rigidly fixed to the butt plate and angularly inclined relative to the butt plate, the bed plate having a free end extension tab inclined above the top edge of the butt plate for interlocking engagement with bracket engaging means secured to the ladder shaft intermediate the ends of the shaft. The means for securing the bracket to the transom may be a screw clamp or other clamping means for easily attaching and detaching the bracket to the transom or it may be more permanent fastening means such as bolts or screws extending through the butt plate and secured to the transom.

It is a further object of the invention to provide the ladder with sets of opposite laterally extending rungs spaced along the bottom portion of the ladder below the bracket, and with a single rung extending laterally from one side only of the ladder shaft adjacent its top end. A rigid U-shaped member having a flat web portion integrally connected at right angles to a pair of legs is welded or otherwise secured by the legs to the ladder shaft intermediate its ends and nearest to the top end, in order to provide a slot between the ladder shaft and the flat web portion for telescoping over the bracket tab.

BRIEF DESCRIPTION OF THE DRAWING

Other objects and advantages of the invention will become more apparent from the following description and drawing in which:

FIG. 1 is a fragmentary perspective view of a transom portion of a small boat illustrating a preferred form of mounting bracket secured to the transom of the boat;

FIG. 2 is a rear elevational view illustrating the invention mounted on the transom of a small boat;

FIG. 3 is a fragmentary vertical section taken on line 3—3 of FIG. 2;

FIG. 4 is a cross sectional view taken on line 4—4 of FIG. 3;

FIG. 5 is a perspective view of an alternate form of mounting bracket;

FIG. 6 is an elevational view looking at the clamp side of a mounting bracket shown in FIG. 5 illustrating the bracket mounted on a transom which is shown from inside the boat by broken lines.

DESCRIPTION OF THE INVENTION

Referring now to the drawing and particularly to FIG. 2 the improved single shaft ladder **10** of this invention is shown mounted by means of a bracket **11** on the transom **12** of a small boat **9**. The hollow ladder shaft **15** is rigidly supported intermediate its closed top and bottom ends **13** and **14** respectively by the bracket **11** so that the bottom end portion **15'** of the shaft extends downwardly and divergently outward from the transom **12** terminating beneath the surface **8** of the water in which the boat **9** floats. The top portion **15''** of the ladder shaft above the mounting bracket **11** extends upwardly and inwardly over the transom **11.** A single laterally extending rung **16** is provided adjacent the top end **13** of the ladder on the side only for a handle to assist a person entering the boat from the ladder. The other side of the upper portion **15''** of the ladder opposite the rung **16** is unobstructed to prevent interference with a person climbing over the transom on the unobstructed side of the ladder. The bottom portion of the

ladder beneath the bracket **11** includes sets **17** and **18** of opposite laterally extending rungs **17***a*, **17***b* and **18***a*, **18***b* respectively. The rung sets **17** and **18** are preferably each a single rod extending through holes **19** and **20** respectively in the shaft **15.** A U-shaped bracket engaging member **21** comprising a flat web portion **22** integrally connected at right angles to a pair of leg portions **23** and **24** is welded or otherwise attached by the leg members to the opposite sides **26,27** of the shaft **15** leaving a space between the web **22** and the underside **28** of the shaft **15** for close fitting telescopic engagement over a bracket tab extension **29** of the bracket **11.** The ladder shaft as shown in the cross sectional view in FIG. **4** is preferably of rectangular tubular light metal stock, such as aluminum having walls **25, 26, 27** and **28.** The interior of the shaft is made a closed air chamber by providing closed ends **13** and **14** and sealing the shaft around the rungs **16, 17** and **18.** The ladder **10** is thus made capable of floating on water as a result of its light weight and enclosed air chamber.

The bracket **11** as shown in FIG. **1** includes a rectangular butt plate **30** which is secured adjacent the top edge of the transom **12** on its stern side by means of stainless steel screws **31** extending through holes drilled in the butt plate along the reinforcing rib **32** on opposite sides of the plate **30.** A bed plate **33** for supporting the ladder shaft **15** is rigidly connected in angularly inclined relationship to the butt plate **30** by spaced parallel gusset plates **34** and **35** welded perpendicularly to the butt plate **30.** The gusset plates **34** and **35** extend above the upper surface of the bed plate **33** to provide a channel which closely engages three sides of the ladder shaft **15.** The upper portion of the bed plate **33** terminates in the free end extension tab **29.**

A second embodiment **11'** of the mounting bracket for the ladder is illustrated in FIGS. **5** and **6.** This embodiment is like the first embodiment with the addition of clamping means for clamping the mounting bracket to an edge of a boat. The mounting bracket **11'** includes a butt plate **30'**, a top plate **36** integrally connected to the top edge of the butt plate and perpendicular thereto, a back plate **38** depending from the remote edge of the top plate **36** in spaced parallel relationship to the butt plate **30'**, an inclined bed plate **33'** for supporting the ladder **10,** having an extension tab **29**; parallel gusset plates **34'** and **35'** connected to the butt plate and top plate in perpendicular relationship thereto and supporting the bed plate **33'** between them, an upstanding reinforcing rib **37** extending medially across the top plate from beneath the bed plate and down the outside of the backplate **38** where it terminates in a circular boss **43,** and a clamp screw **39** extending through a threaded bore in the boss **43** in perpendicular relationship to the butt plate **30'**. The clamp screw **39** has a circular clamping jaw **40** rotatably connected on its inner end and a handle **41** pivotally connected by pivot pin **42** at its outer end. FIG. **6** shows the mounting bracket **11'** clamped to the transom **12** (shown in broken lines) of a small boat. By turning the screw **39** the clamping jaw **40** may be moved toward or away from the inside face of the butt plate **30'** to clamp or loosen the bracket relative to a side edge of a boat. The manner of supporting the ladder **10** on the mounting bracket **11'** is the same as described with respect to the mounting bracket **11** illustrated in FIGS. **1, 2** and **3,** the ladder shaft **15** resting on the bed plate **33'** between the gusset plates **34'** and **35'** with the tab **29'** of the bracket **11'** extending through the slot provided between the U-shaped member **21** and the shaft **15.**

The brackets **11** and **11'** are preferably made from a strong light weight metal such as aluminum which are resistant to corrosion in the environment in which they are used. The angular relationship of the bed plate to the butt plate is preferably within the range of 35° to 40 degrees.

In use of the invention to board a small boat a swimmer will approach the transom mounted ladder **10** from the stern. In so doing (assuming the boat is anchored from the bow and is aligned with the direction of current flow) the swimmer will swim into the current to approach the boat and will not be subject to side currents. On reaching the ladder **10** the swimmer can grasp the lower rungs of the ladder and pull himself forward until his knees rest on the bottom set of rungs **17.** After resting on the bottom set of rungs, the swimmer can then proceed to climb the ladder while leaning forward so that air tanks or the like which the swimmer may carry on his back exert a downward force through the swimmer's shoulders tending to force the swimmer toward the ladder instead of pulling him backward as would be the case if the ladder were supported in a near vertical position with respect to the transom. The swimmer on reaching the top of the ladder grasps the top rung **16** with his left hand and swings himself into the boat on the unencumbered side of the ladder opposite the rung **16.** When the swimmer is in the boat, the ladder **10** may be lifted aboard by grasping the rung **16** and pulling up on the ladder until the loop **21** disengages the tab **29** of the bracket whereupon the lightweight ladder may be easily lifted into the boat and the boat can be gotten under way.

The term small boat as used in this specification refers to a boat usually of the open cockpit type which is normally propelled by an outboard motor and thus has a transom shaped to supported the outboard motor, and it is for this type of boat that the invention is particularly but not exclusively useful.

What is claimed is:

1. An improved ladder and mounting for small boats comprising in combination a single shaft ladder having top and bottom ends and bracket engaging means secured to the shaft intermediate said top and bottom ends and dividing said ladder into top and bottom end portions, and a bracket adapted to be secured near the top edge of the transom of a boat for supporting said ladder angularly inclined with respect to the transom with the bottom end portion of the ladder extending in a downwardly diverging direction with respect to the transom and with said top end portion extending above and over the top edge of the transom, said ladder having sets of laterally extending opposite rungs spaced along the bottom portion of the ladder, and a single rung laterally extending from one side of said ladder providing a handle near the top end of the ladder.

2. The combination according to claim **1** wherein said bracket includes a butt plate adapted to abut the transom, means for securing said butt plate to said transom, a bed plate for supporting said ladder shaft and means rigidly supporting said bed plate in angularly inclined relationship with respect to said butt plate, said bed plate having a free end extension tab projecting above said butt plate, said bracket engaging means comprising means for interlocking with said tab and rigidly holding said ladder shaft on said bed plate.

3. The combination according to claim 2 wherein said bed plate is inclined with respect to said butt plate at an included angle selected within the range of about 35° degrees to about 40° degrees.

4. The combination set forth in claim 2 wherein said means rigidly supporting said bed plate includes a pair of spaced, parallel gusset plates rigidly joined perpendicularly to said butt plate, said bed plate being included between said gusset plate and rigidly secured to said gusset plates with the gusset plates extending above the upper surface of the bed plate to provide a channel which is adapted to closely engage three sides of the ladder shaft.

5. The combination set forth in claim 2 wherein said means for securing said butt plate to said transom includes an adjustable screw clamp.

6. An improved boarding apparatus for use by swimmers, SCUBA divers and the like in boarding small boats comprising in combination a small boat having a transom with a top edge, a single shaft ladder having top and bottom ends and bracket engaging means secured to the shaft intermediate said top and bottom ends and dividing the ladder into top and bottom end portions, and a bracket secured near the top edge of the transom and detachably supporting said ladder in angularly inclined relationship with respect to the transom with the bottom portion of the ladder extending in a downwardly diverging direction with respect to the transom and with said top end portion extending above and over the top edge of the transom, said ladder having sets of laterally extending opposite rungs spaced along the bottom portion of the ladder, and a single rung extending from one side of the ladder providing a handle near the top end of the ladder.

* * * * *