ABSTRACT: A light-draft marine craft, preferably of the inboard motor type, has a prefabricated boarding step unit built into one or both of the beam sides thereof. The unit is outboard of the boat hull in its entirety and is mounted a trifle above the chine and substantially forward of the transom. A step device of the unit has spaced rigid legs slideable in the tubular sockets recessed and sealed in the hull, extending in the inboard and upward direction. The step device is spring-biased upwardly in its leg sockets, and has a bottom cross-tread, step or stirrup piece which is mounted from outboard by a water skier, swimmer or other user, whose weight draws the step device downwardly against its spring bias.
BOARDING STEP FOR BOATS
BACKGROUND OF THE INVENTION

1. Field of the Invention
The boarding step of the invention will find application substantially exclusively, in marine sports craft, and usually of a light-draft type. These boats are commonly used to transport swimmers and/or water skiers, whose need to reenter the boat in Fig. 1, and Fig. 2 is thereby aided by the improved step, without the assistance of anyone inboard. Thus the unit qualifies both as an aquatic sport adjunct and, more significantly, as a marine safety factor.

2. Description of the Prior Art
A preliminary search has revealed the most pertinent prior art as being the U.S. Pat. to Rehkopf, No. 691,872, Geddes, No. 2,141,182 and Fugere, No. 3,031,309.

Rehkopf and Fugere respectively show buggy step and truck step ladder units, while Geddes relates to a far-above-water space for a launch boat for an oceangoing vessel. None of these has pertinence to the present invention, as claimed.

SUMMARY OF THE INVENTION
In the use of small boats, especially when water skiing, it is virtually impossible to climb back into the boat without the use of some sort of ladder or step. There are on the market many ladders which hang over the side of the boat hull and are pulled up and stored in the cockpit when not in use. These units are cumbersome and hard to store. Some manufacturers have built a hinged section of the hullside which opens to form steps into the boat. This unit requires a major modification to the boat and may adversely affect the structural integrity of the latter.

The improvement of the invention provides a small retractable step, tread or stirrup located on the hullside just above the chine. This lies just below the water line with the boat at rest, but would be free of the water when the boat is planning. It is spring loaded to hold it up in a retracted position, the weight of the user moving the step into the operational position.

In addition to avoiding the disadvantages, among others, mentioned in the second-preceding paragraph, the boarding unit of the invention is simple, compact, inexpensive, and readily installed by an unskilled person. It is, moreover, attractive in appearance as installed, presenting no significant interruption in the continuity of the hullside; and it normally presents no objection such as might endanger others or occasion damage to the hull by reason of impacting a fixed structure.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a fragmentary perspective view showing the boarding step unit of the invention as typically installed on a boat, and the manner in which it is intended to be used by a boarder;

FIG. 2 is a fragmentary perspective view, similar to but in larger scale then FIG. 1, of the unit in an inwardly and upwardly retracted condition of its spring-biased step;

FIG. 3 is a fragmentary view in still greater scale, showing operating components of the unit in vertical cross section in a plane at 90° to the boat hull, a partially weight drawn down position of the boarding step being indicated in dotted line; and

FIG. 4 somewhat schematically illustrates in solid and dotted line features of an alternative embodiment of the invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

The manner of use of the improved boarding step unit of the invention, generally designated by the reference numeral 10 is illustrated in FIG. 1, and FIG. 2 shows the device in a fully retracted position, substantially inboard of the hullside 11 of a motor craft 12 to which the unit is applied. It is located somewhat above the chine line 13, and well below the waterline L of the boat when the latter is at rest, but exposed when the latter is in operation. At such time, the unit 10 is substantially flush with the vessel's hull shell, presenting no significant projection such as might possibly be dangerous to others or, indeed, to the craft itself, by reason of striking a fixed pier or other object.

As shown in FIG. 3, a partial cross section of the vessel 12 shows the ladder as being typically constructed of an exterior sheathing 14 of fiberglass laminate, sheet metal or wood applied to a plywood backing 15; and the bulk of the boarding step unit 10 is received in the hull space between the reinforced sheathing and an upright inboard cockpit panel 15 mounted fixedly to a deck stringer 16.

In order to receive the unit 10, the hullside is provided somewhat above chine 13 with an elongated rectangular or oblong opening 17 which extends upwardly and inboard at a quite sharp angle; and this opening receives, with substantial lateral clearance, a base mounting casting 18 of unit 10, which is preferably of a well-polished stainless steel. Casting 18 is in the form of a housing integrally closed across its top between a pair of tubular leg guide or socket portions 19, so as to substantially prevent the entry of water other then at the sockets 19. Mounting member 18 is externally flanged at 20 about its entire perimeter, which flange comes substantially flush with the hull sheathing 14; and a number of headed screws 21 extend through the flange and the sheathing 14 and backing 15 to hold the boarding step structure fixedly in place. An appropriate sealing compound 22 fills the clearance space between mounting member 18, including its flange 20 and the hole 17 and external hull surface.

Each of the guide sockets 19 presents an integral, reduced diameter guide extension 22; and an elongated copper housing tube 24 telescopes over the guide elements 19. Casting 18 is designed to receive an appropriate liquid-tight seal to casting 18 in these two zones. An end closure cap 25 is applied to the top of each tube 24. The reference numeral 27 designates a one-piece step or tread component or subassembly of unit 10. It is constituted by a bottom cross tread or stirrup piece 28, the top and ends of which a pair of elongated tubular guide members or posts 29 are welded or otherwise fixedly secured. Indeed, it is contemplated that the subassembly 27 might take the form of a unitary casting of an appropriate metal resistant to corrosion.

The top of each guide member 29 is threaded to receive an annular spring guide and abutment element or ring 30; and an elongated coil compression spring 31 surrounding each member or post 29 pilots on the body of each element 30, the spring end abutting an external flange of the latter. The opposite, lower end of spring 31 similarly pilots on the external end 23 of a tubular socket 19, in the space between the extension and the housing tube 24, abutting downwardly against member 19.

Accordingly, the springs 31 serve to maintain a constant effort biasing the tubular guide members or posts upwardly, thus ordinarily maintaining the tread element 18 fully elevated to the base of the mounting casting 18, as shown in FIG. 3, and in solid line in FIG. 3. A sufficient portion of the tread element projects to enable a swimmer or water skier to pull the tread subassembly 27 downwardly to enable him to place a foot on tread or stirrup 28 and thereby step over the gunwale of boat 12. As the boarder's weight leaves the tread, the tread structure 27 follows and takes its retracted position in a substantially shock-free manner. A small vent opening 32 is formed in tube 24 adjacent the top thereof and at a sufficient elevation to be above the waterline L. Thus, any substantial water upwardly entering the tube may be discharged to the bilge.

FIG. 4 shows in a somewhat schematic fashion a slightly modified embodiment 34 of the boarding step improvement of the invention. In this case, the base mounting member of the unit is substantially the same as the cast member 18, hence is designated 18'; and its features are designated by numerals, primed, corresponding to that of the member 18.
The step tread unit, generally designated 36, is in this case in the form of a single stainless tube of U-shaped outline, presenting a cross-step or stirrup portion 37 and parallel elongated tubular leg portions 38 which slide in guide sockets 39. Spring provisions for retracting the tread unit 36 are similar to those shown in FIG. 3; and the leg portions 38 will bottom upwardly against the ends of the elements 39.

The device 10 is simple, inexpensive of production and assembly, requiring very little by way of alteration of the boat's hull structure, and detracting not at all from the appearance of the latter. It has sales appeal and practical advantages of considerable significance over the crude boarding structures previously employed, as mentioned in the summary.

What I claim is:

1. A boarding step structure for application to the hullside of a watercraft, comprising an elongated step unit retractable into and withdrawable from a hole in said hullside, means comprising a flange plate waterproofingly sealed around said hole to said hull, tubular guide means disposed inboard of the hullside and extending inwardly and upwardly in a position inwardly of said hole, an elongated tubular housing member sealed to said flange and enclosing said step unit along the length of the latter, a cap for sealing the upper end of said housing, an opening in said housing, said opening being higher than the waterline and positioned to discharge water entering said housing into the bilge of the watercraft and a coil spring acting at one end on said step unit, said spring being fixedly restrained at its opposite end to bias the step unit in the direction inboard of the hullside, the step unit having a tread member lying closely adjacent the hullside when the step unit is thus biased.

2. A boarding step structure for application to the hullside of a watercraft, comprising mounting means having at least one tubular socket member positioned to extend in said hole, an elongated tubular housing member coaxially sealed to said socket member and coaxially enclosing said step unit along the length of the latter, and a coil spring surrounding and acting at one end on said step unit, said spring being fixedly restrained at its opposite end by said housing member to bias the step unit in the direction inboard of the hullside, the step unit having a tread member lying closely adjacent said mounting means and the hullside when the step unit is thus biased, when inboard said tread means projecting outwardly beyond said hullside by a distance which provides a toe hold for extending said boarding step.

3. The step structure of claim 2, in which there are a pair of said tubular socket members paralleling one another and a pair of said housing members coaxially secured to the respective socket members, the step unit having a pair of elongated members which are received in the respective housing members, each member of the step unit being surrounded and biased by a coil spring.

4. The step structure of claim 3, in which the springs are compression springs acting respectively at one end against a socket member of the mounting means, each of said step unit members having an abutment engaged by the opposite end of its coil compression spring.

5. The step structure of claim 3, in which said mounting means comprises a flanged base having means to apply it fixedly to the exterior of the hullside and over the hullside hole.

6. The step structure of claim 4, in which said mounting means comprises a flanged base having means to apply it fixedly to the exterior of the hullside and over the hullside hole.

7. A watercraft equipped with the step structure of claim 1.

8. A watercraft equipped with the step structure of claim 2.

9. A watercraft equipped with the step structure of claim 3.

10. A watercraft equipped with the step structure of claim 4.

11. A watercraft equipped with the step structure of claim 6.