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SPORT BRIDGE SELF-CONFORMABLE TO CAMBERED CABIN TOP

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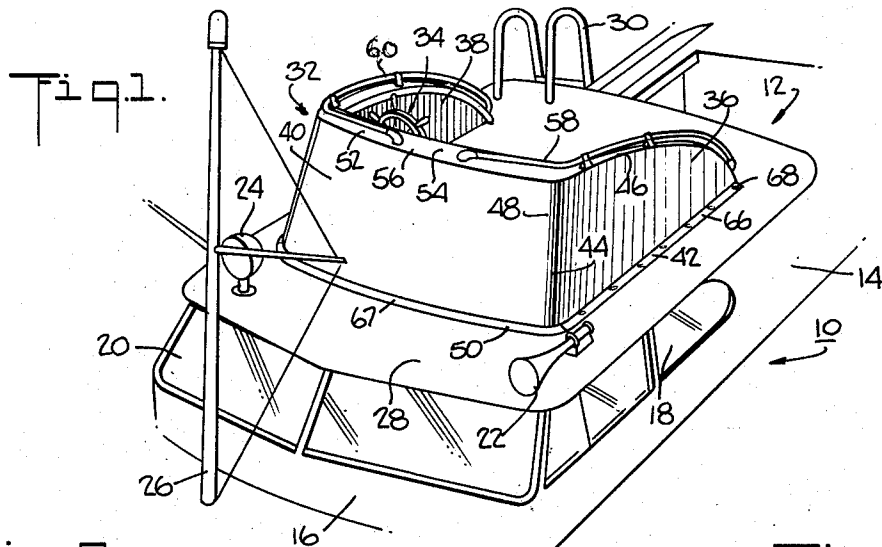
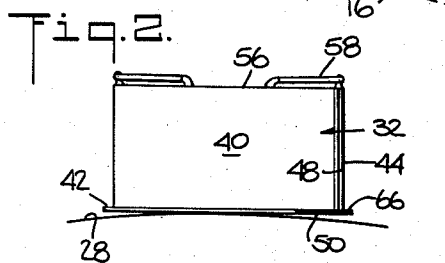
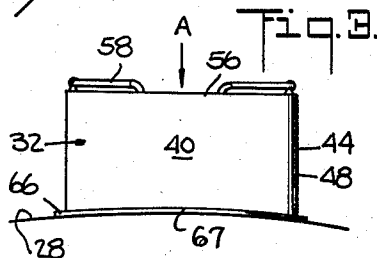
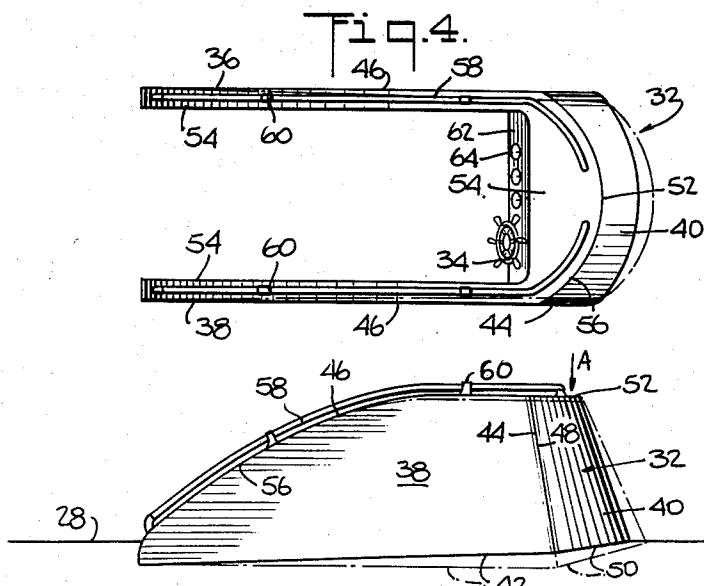


Fig. 5.

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**SPORT BRIDGE SELF-CONFORMABLE TO
CAMBERED CABIN TOP**

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This invention relates to a sport bridge which is self-conformable to a cambered cabin top.

Water-borne craft such as small fishing vessels, cruise yachts, and speed boats are commonly constructed with a topped cabin. In modern boat design the cabin top constitutes a transversely upwardly curved or arched, that is to say cambered, roof which is so formed as to shed water and offer low wind resistance while at the same time presenting a streamlined, interesting and aesthetic appearance and maximum cabin space. Boat owners however are often not content with the construction of their pleasure craft especially after they have had the use and possession of their craft for a few boating seasons. One modification which is usually desired by boat owners is the addition of a sport bridge. Such a sport bridge is basically a three sided enclosure fixed to the top of the cabin roof which enables the cabin roof to be advantageously put to additional use. With the sport bridge fixed in its proper location on top of the roof, a useable play and sport area is created wherein none existed previously and a higher control and vantage area is available.

The floor of this area is, of course, the top of the cabin roof. The three sided sport bridge allows the boat owner and his friends to safely remain in this area while the boat is either stationary or under way. In this area, sun tanning, lounging or fishing may take place; the area also offers a relatively high vantage point from which the surroundings can be viewed and the boat controlled.

Previous to the introduction of my novel sport bridge, the addition of such a structure to an already existing boat was considered a very costly undertaking. In fact, only boats in the luxury class would have such sport bridges subsequently superimposed upon their existing structures. The reason for this high cost was that the fitting of the sport bridge to the camber of the cabin roof was a difficult and laborious matter requiring the use of highly skilled workers. The cost of the construction was far greater than the cost of the materials. Skilled carpenters were required to plane, bend or otherwise form the bottom rim of the sport bridge to the contour of the cabin roof so that the two surfaces would match and give a custom-fitted appearance.

Since most boats are built either individually or in limited production runs, there is an insufficient number of boats having similarly cambered cabin roofs to make the mass production of sport bridges having predetermined bottom curvatures practicable. In fact it has been the rule that such sport bridges are built usually by a boat yard and especially to fit a specified boat of an owner who had ordered the same.

It is a primary object of my invention to provide a sport bridge of the character described whose bottom periphery can be readily adapted to match the cambered cabin roof of most sport boats without the necessity of fabricating an individual sport bridge to fit only a specific model of boat.

It is a further object of my invention to provide a sport bridge of the character described which can be easily installed by a do-it-yourself boat owner who has only a minimum amount of craft skills.

It is another object of my invention to provide a sport bridge of the character described which, when emplaced

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by a home craftsman, will give the appearance of a professionally custom-fitted job. I desire that when the sport bridge, made in accordance with my invention, is correctly placed in position for use it will have the individually tailored, finished appearance which previously only a boat yard was able to produce.

It is yet another object of my invention to provide a sport bridge of the character described which, while having the advantage of being conformable to any cabin roof, is yet neat and streamlined without betraying the fact that it is in fact a mass produced item.

It is another object of my invention to provide a sport bridge of the character described which is a unitary structure, which is light weight yet sturdy, which is resistant to the corrosive effects of weather and sea water, and which while having all the foregoing advantages can be manufactured by mass production methods at a relatively low cost so that boatmen of even modest means can by the purchase and use of this item enliven and enhance the appearance of their boats.

These and various other objects and advantages of my invention will become apparent to the reader in the following description.

In accordance with the teaching of the present invention, I provide a sport bridge which consists of a three-walled open-topped U-shaped enclosure, the walls being continuous and unitary with one another. The structure consists of two side walls which run fore-and-aft and which preferably are substantially parallel, said walls being connected by a forwardly bowed rearwardly inclined front wall. Desirably, these side walls are substantially vertical. The structure is composed of a slightly flexible, rather stiff, self-form-maintaining material.

The configuration of the bridge and the nature of the material from which it is made is such that sufficient force applied vertically downwardly on the front wall of a bridge located on a cabin top causes the front wall to bow further outwardly causing the bottom edge of the front wall to assume a progressively greater camber until it defines a curved surface which matches the camber of the cabin roof on which the sport bridge is situated when the aforesaid force is applied. When the curve defined by the bottom periphery of the sport bridge matches the camber of the cabin roof, mechanical attaching means permanently fasten bottom flanges on the side walls of the sport bridge to the top of the cabin roof. Optimally, trimming may be added to complete the installation, which has been carried out in a short period of time by one having only a minimum amount of skill in carpentry.

My invention accordingly consists in the features of construction, combinations of elements, arrangements of parts and series of steps which will be exemplified in the sport bridge and process hereinafter described and of which the scope of application will be indicated in the appended claims.

In the accompanying drawings in which is shown one of the various possible embodiments of my invention,

FIG. 1 is a three-quartered perspective view of my sport bridge properly installed on the cabin roof of a small pleasure boat;

FIGS. 2 and 3 are front elevational views of the sport bridge showing, respectively, the sport bridge in a relaxed or non-conformed position and the sport bridge in conformed position;

FIG. 4 is a top plan view of the sport bridge, wherein solid lines show the non-conformed position and dot-and-dash lines show the conformed position; and

FIG. 5 is a left side elevational view of the sport bridge similarly showing the non-conformed and conformed positions of the bridge.

Referring now in detail to the drawings, the reference

numeral 10 denotes a pleasure craft of the type commonly possessed by amateur sportsmen. Such a craft may be used on inland waters and, if large enough, for off shore cruising. This type of boat may be used for fishing, pleasure cruising, water skiing and similar leisure-time activities.

The craft 10 includes a cabin 12 defined by side walls 14 and a front wall 16. The side walls 14 include side windows 18 and the front wall 16 includes a windshield 20.

The cabin 12 is topped by a roof 28 which usually has sufficient structural strength to support, without failure, numerous persons and equipment which may stand or be placed thereon.

Other accessories common to such pleasure craft include a horn 22 and a searchlight 24 both mounted on the roof, and a mast 26 mounted on the deck forward of the cabin 12.

As a matter of common practice, such cabin tops or roofs 28 are transversely arched or upwardly curved, i.e. are cambered. This curvature is symmetrical about a fore-and-aft central longitudinal axis. That is to say, the roof top approximately comprises a segment of a cylinder of large radius, this hypothetical cylinder having its longitudinal axis horizontal and parallel to the fore-and-aft central axis.

As has been previously said, the roof 28 is strong enough to support both persons and equipment and may have a ladder 30 providing access from the main deck of the boat. Although the roof, without additional structure, would be capable of holding the mentioned persons and equipment, it will be appreciated that such use would be dangerous when the boat was under way because of the normal listing, rocking, swaying and unexpected lurches encountered in cruising even at moderate speeds. Therefore, in order to transform the roof 28 into a useable sport, play, vantage and control area, a sport bridge 32 is affixed thereto.

When my sport bridge is firmly and properly installed, it provides a side enclosed but open-topped area the floor of which consists of the cabin roof 28 and the sides of which are defined by the upstanding walls of the sport bridge. Within this area the boat owner or his guests may safely take pleasure by viewing from a high vantage point the surrounding scenery, may sun bathe, may fish, or may otherwise similarly amuse themselves. If desired, appropriate navigational equipment including a steering wheel 34 may be installed on the cabin roof 28 within the enclosed area so that the craft may be controlled from this area.

The sport bridge 32 comprises a three-walled open-topped U-shaped one piece continuous structure, including two side walls running fore-and-aft and which may be parallel, to wit a right side wall 36 and a left side wall 38, and a connecting front wall 40. The right side wall 36 is vertical and as mounted is adjacent and parallel to the right side wall 14 and the left side wall 38 is vertical and as mounted is adjacent and parallel to the left side wall 14. The front wall 40 of the port bridge as mounted is rearward of and substantially parallel to the windshield 20 of the pleasure craft 10.

Each side wall 36, 38 of the sport bridge 32 is substantially planar and has a linear substantially horizontal bottom periphery 42, an upwardly and rearwardly inclined vertical front edge 44 and a curved downwardly and rearwardly sloping top edge 46. To give the sport bridge a streamlined appearance, the top edge 46 is sloped rearwardly and first slowly and then rapidly downwardly so that it defines a faired curve which runs from the top of the front edge 44 to the rear of the bottom periphery 42. Each front edge 44 is rounded into the side edge 48 of the front wall 40.

The front wall 40 is forwardly bowed or convex and is rearwardly inclined; said wall approximately comprises a segment of the surface of a large radius cylinder whose axis is centered approximately 60° to the horizontal. The

axis of this hypothetical cylinder slopes rearwardly so that the bottom periphery 50 of the front wall 40 protrudes forwardly more than the top edge 52 of the front wall. (See FIG. 5).

The sport bridge 32 is formed from a single sheet of slightly flexible rather stiff self-form-maintaining material. That is to say, the front wall and side walls are strong and stiff enough to maintain their own configuration but can be flexed by application of a person's weight into another and different configuration.

The sport bridge 32 has been successfully commercially produced from resin-impregnated glass fibers. Other plastics or other sheet materials, e.g. sheet metal or thin plywood, having similar characteristics, may also be advantageously employed. The bridge may be formed by first impregnating a sheet or sheets of the glass fibers with the resin, e.g. an epoxy resin, and then placing this impregnated sheet or sheets in an appropriately formed mold to cure and harden. Any other standard method of molding may be utilized.

The top edge of the sport bridge 32, which top edge is made up of the top edges 46 of the side walls and the top edges 52 of the front wall, has an inwardly turned flat continuous flange 54. The flange 54 is considerably wider adjacent the front wall 40 and is comparatively narrow adjacent the side walls 36, 38.

The top flange 54 forms a bend 56 where it joins the side walls and front wall and thereby stiffens and rigidifies the entire top edge of the sport bridge. It will be appreciated that since the top edge will most often be gripped by users thereof, this area should be very strong and resistant to flexing.

A metal, e.g. a stainless steel or brass railing 58 may also run along the top edge 52 and is joined to the flange 54 by several short anchor stanchions 60. The stanchions are disposed at intervals along the flange 54 and directly join the railing 58 to the flange 54.

The sport bridge also includes an instrument panel 62 on which various navigational instruments 64 and the steering wheel 34 may be mounted in a conventional and well known manner. The instrument panel 62 runs on the inside of the sport bridge 32 rearwardly and downwardly from the top flange 54 adjacent the front wall 40. The top edge of the instrument panel is preferably unitary with the flange 54.

The sport bridge 32 also has an outwardly turned integral flange 66 which runs along the bottom peripheries (edges) of the side walls 36, 38 to stiffen those edges and the side walls. No similar integral flange is formed on the bottom edge of the front wall which, however, has associated therewith a right-angle molding 67 of elastomeric material. The absence of a stiffening flange on the bottom edge of the front wall leaves this edge flexible. The flange 66 has numerous spaced apertures 68 through which screws, bolts or the like may pass, the head of the screw or bolt being disposed on the top side of the flange and the shank thereof passing through an aperture and into the roof 28 of the craft 10.

As molded, that is to say in its relaxed or non-formed condition, the sport bridge assumes a configuration as shown in FIG. 2 and as shown in solid lines in FIGS. 4 and 5. At this time the bottom edges of the side walls are approximately parallel and lie in substantially a common plane. The bottom edge of the front wall is of such front elevational contour (see FIG. 2) that the camber thereof is less than the camber of commercial cabin tops, i.e. the radius of curvature of said edge exceeds the radius of curvature of commercial cabin tops so that when the bridge is placed on a cabin top with the center of the bottom edge of its front wall on the fore-and-aft center line of the cabin top the ends of the front wall will be spaced above the cabin top (see FIG. 5).

The installation of the sport bridge, that is to say, the conforming of the sport bridge to the camber of

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the cabin roof 28 and its permanent attachment in this position, may be carried out easily by a home craftsman of ordinary skill within a relatively short period of time. The sport bridge is placed on top of the cabin roof 28 at the specific location at which it is to be affixed. When so placed, the sport bridge will be in an unflexed or non-conformed position. In this position, due to the described shape of its bottom periphery, the sport bridge will contact the cabin roof 28 in only three places: the center of the bottom periphery 50 of the front wall 40 and the rears of the bottom peripheries 42 of the side walls 36, 38 (see FIG. 2 and solid lines of FIG. 5).

Pressure is then applied to the top of the front wall 40 in the direction and at the location indicated by the arrow "A" shown in FIGS. 3 and 5. Sufficient pressure may be applied by a downward thrust applied by the weight of the installer.

This downward pressure causes the sport bridge to yield along the lines of least resistance. The principal change in configuration is the increased arching or further forward and outward bowing of the front wall 40. The top edge of the front wall 40 moves somewhat downwardly and the bottom periphery 50 of the front wall bows further forwardly and outwardly. At the same time the front edges of the stiff side walls move downwardly until the lower corners of said front edges strike the cabin top. Thereby since the elevational height of the center of the front wall decreases as the bottom center bows further forwardly and since the elevational height of the front edges of the side walls remain substantially constant, the camber of the bottom edge of the front wall increases until it matches the camber of the cabin top. The foregoing motions are permitted and accompanied by rearward movement of the side walls.

Concurrently the lower ends of the front edges of the side walls pull inwardly (see FIG. 4) to increase the rate at which the camber rises. This narrowing of the effective width of the front wall of the sport bridge is not marked but assists in matching the camber of the bottom edge of the front wall of the bridge to the camber of the cabin roof.

The downward force applied to the front wall 40 thus flexes the flexible front wall to a position where its bottom periphery defines a curved surface which contacts the surface of the cabin roof 28 at every point along its length. As will be seen by a comparison of the front plan views of FIGS. 2 and 3, the bottom periphery 50 of the front wall is shifted from lying in a horizontal plane to an arch that exactly matches the curved surface of the roof 28. As seen in FIG. 5, the side walls have their bottom peripheries 42 swung downwardly about their rear ends into full contact with the roof top 28. The displacement between the conformed (dot-and-dash) and relaxed (solid) lines has been somewhat exaggerated in the drawings for clarity.

When, by the application of the aforementioned pressure, the bottom periphery of the sport bridge has been conformed to the camber of the cabin roof 28, screws, bolts or the like are passed through the apertures 68 in the bottom flanges 66 in the side walls and into the cabin roof 28 so as to permanently fasten the sport bridge in its conformed condition. The flexible molding 67 seals the crack between the cabin top and the bottom edge of the front wall of the bridge.

It will now be evident to the reader of the instant disclosure that I have presented a sport bridge which is readily conformable to the contour of a cambered cabin roof and which can be installed by the home craftsman without cutting; planing or other complex shaping process. Rather, my sport bridge may be mass produced at relatively low cost in a number of sizes dependent only upon the general size of the craft 10; it can be quickly and easily thereafter fixed to pleasure craft to present the appearance of a professionally custom tailored construction.

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It will be apparent that, if desired, the flange 54 can be extended a considerable distance rearwardly and that the side and front walls can be of a sufficient height to cooperate with such extended flange to form a cabin. It also will be obvious that the front wall (and/or the side walls) may be fabricated from transparent material or can contain apertures covered by transparent panes to function as windows.

It will be observed that in FIGS. 4 and 5 where it appears that the front wall 40 has its center shifted forwardly such illustration has been employed for the purpose of clarity since in actual installations the bottom of the center of the front wall will be held stationary and the side walls will move rearwardly as the front wall increases its forward bow. Also, in order to avoid confusion between closely spaced lines, the bottom flanges 66 and the bottom molding 67 have been omitted in FIGS. 4 and 5.

It thus will be seen that I have provided a device and method which achieve the several objects of my invention and which are well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and useful, and desire to secure by Letters Patent:

1. A one-piece sport bridge conformable to a cambered cabin roof contour, said bridge being formed from a slightly flexible stiff self-form-maintaining material and comprising three unitary upstanding continuous walls, said walls constituting two fore-and-aft side walls and a forwardly bowed rearwardly inclined front wall, said front wall having a bottom edge with a camber less than the camber of the cabin roof, said bridge being shiftable downwardly from a position of repose centered fore-and-aft on the cabin roof to a conformed position where, by the further outward bowing of the front wall and concurrent downward movement of the front ends of the bottom edges of the side walls, the bottom edge of the front wall conforms to and contacts the contour of the cabin roof.

2. A sport bridge as set forth in claim 1 wherein the side walls are substantially parallel.

3. A sport bridge as set forth in claim 1 wherein each side wall has a bottom flange, said flanges stiffening the bottom edges of the side walls.

4. A sport bridge as set forth in claim 1 wherein when the sport bridge is in its conformed position, the front of the side walls are inwardly canted.

5. A sport bridge as set forth in claim 1 wherein the material from which the bridge is formed is resin-impregnated glass fibers.

6. A sport bridge as set forth in claim 1 wherein the top edge of the sport bridge has a continuous inwardly turned flange.

7. A sport bridge as set forth in claim 1 wherein mechanical attaching means fix the sport bridge in its conformed position to the cabin roof.

8. A sport bridge as set forth in claim 3 wherein mechanical attaching means fix the bottom flanges to the cabin roof when the sport bridge is in its conformed position.

9. The method of conforming and fixing a sport bridge to a cambered cabin roof of a pleasure craft, including the steps of:

- (a) presenting a one-piece sport bridge formed from a slightly flexible stiff self-form-maintaining material and comprising three unitary upstanding continuous walls, said walls constituting two fore-and-aft side walls and a forwardly bowed rearwardly inclined front wall;

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- (b) placing the sport bridge on the cambered cabin roof centered on the fore-and-aft center of the roof;
 (c) applying downward force on the top edge of the front wall to shift the sport bridge from a position of repose wherein the bottom edge of the front wall has a camber less than the camber of the cabin roof to a conformed position wherein, by the further forward bowing of the front wall and concurrent downward movement of the front ends of the bottom edges of the side walls, the bottom edge of the front wall conforms to and contacts the cabin roof; and
 (d) attaching the bottom edges of the side walls to

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the cabin roof, while the sport bridge is in its conformed position.

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