March 12, 1968 O. L. LUGER ET AL 3,372,408

SECTIONAL BOAT STRUCTURE

Filed March 11, 1966

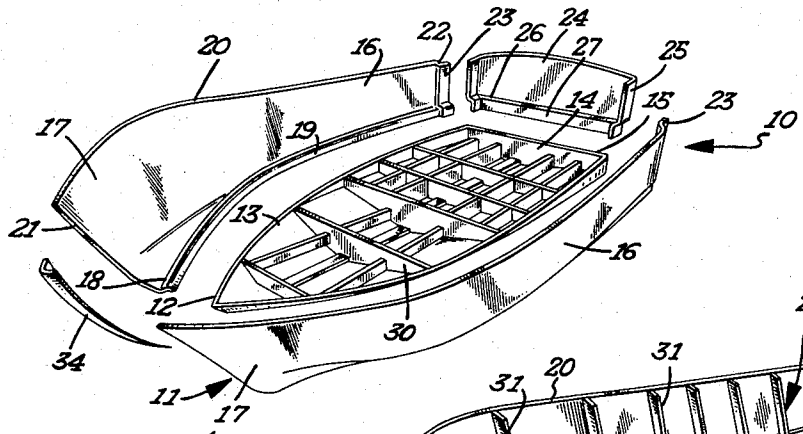


FIG 1

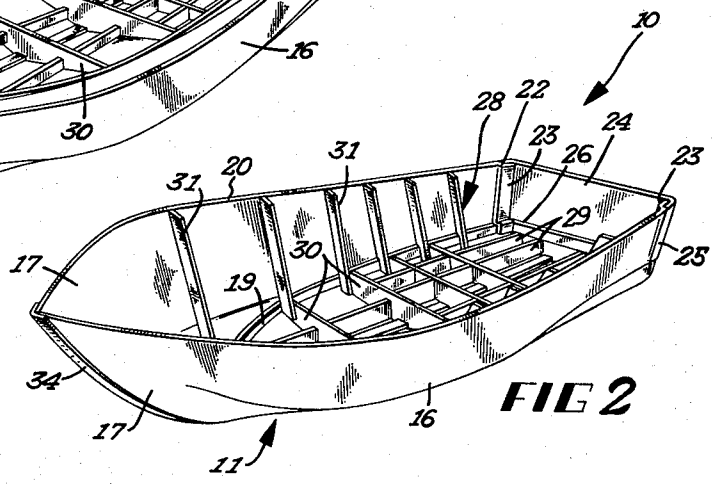


FIG 2

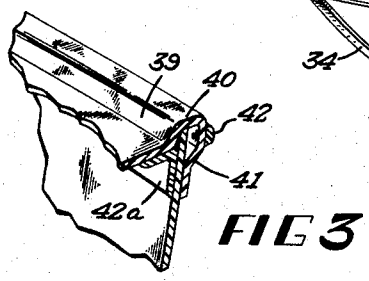


FIG 3

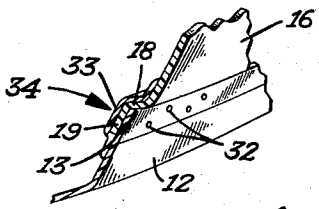


FIG 4

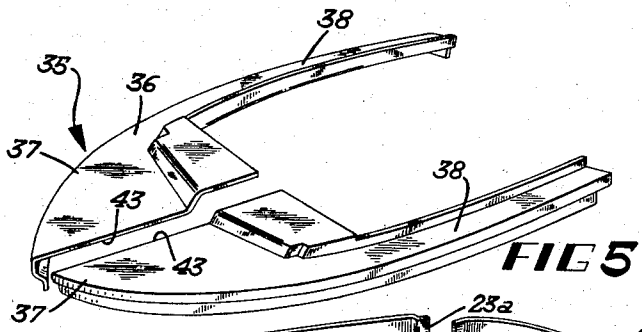


FIG 5

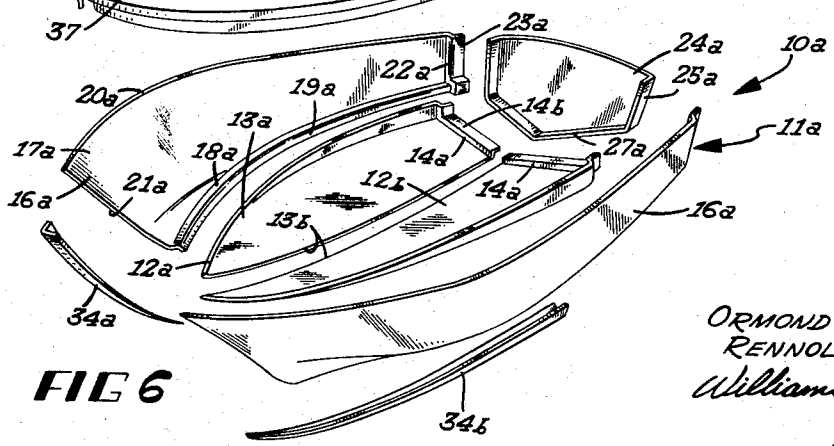


FIG 6

INVENTORS
ORMOND L. LUGER,
RENNOLD J. LUGER
Williamson & Palmatier
ATTORNEYS

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SECTIONAL BOAT STRUCTURE

Ormond L. Luger and Rennold J. Luger, Jr., Edina, Minn., assignors to Luger Industries, Inc., Minneapolis, Minn., a corporation of Minnesota

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ABSTRACT OF THE DISCLOSURE

A sectional plastic boat kit including a lower section defining the bottom portion of the boat hull. A pair of side sections secured to the lower section and defining the sides of the boat. A transom section extending between and secured to the side sections and secured to the lower sections. A pair of deck sections secured to the side sections, and a channel shaped joint member overlapping and secured to the side sections. A frame structure secured to the interior surfaces of the lower and side sections to maintain a proper contour of the boat.

This invention relates to boats and more specifically to a sectional boat.

The general object of this invention is to provide a sectional boat formed of a fiberglass reinforced plastic material in which relatively large sections of the boat are preformed so that the boat may be shipped and sold in kit form. By preforming the boat so that the sections which are preformed actually constitute longitudinal sections of the boat, a boat kit may be provided wherein the parts may be included in a package of relatively small compass with respect to the width and depth dimensions of the package. With this particular arrangement, boat kits for relatively large boats such as cruiser size, approximately thirty feet or more, may be provided but which may be very conveniently and economically shipped and otherwise handled. Specifically, the longitudinal sections of the boat including the bottom or lower hull structure and sides are preshaped, preferably by molding, and are joined together by suitable fastening means such as bolts, adhesive means and the like.

These and other objects and advantages of this invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is an exploded front perspective view of the hull of the boat illustrating the shape and structure of the various sections prior to assembly;

FIG. 2 is a front perspective view of the hull of the boat in an assembled condition;

FIG. 3 is an enlarged fragmentary detailed view illustrating how certain parts of the sectional boat are joined together;

FIG. 4 is an enlarged fragmentary detailed view illustrating how other sections of the boat are interconnected together;

FIG. 5 is a front perspective view of the deck section; and

FIG. 6 is an exploded front perspective view similar to FIG. 1 but illustrating a modified form of the boat.

Referring now to FIGS. 1–4 it will be seen that one embodiment of the novel sectional boat, designated generally by the reference numeral **10**, is there shown. The sectional boat is preferably delivered to a purchaser in kit form, but is arranged and constructed to permit ready assembly thereof and includes a sectional hull designated generally by the reference numeral **11**.

The sectional hull **11** includes a lower section **12** formed of fiberglass reinforced plastic material such as a polyester

system and which defines the bottom of the hull. This lower section has a concave upper surface and a convex lower surface and the width of this lower section progressively narrows from approximately midships forwardly to a substantially upwardly inclined bow or prow line. The concave or convex lower section **12** terminates upwardly in longitudinal peripheral edge portions **13** that define attachment surfaces and the stern end of the lower section is defined by a transverse upstanding shallow stern wall **14** that also terminates in an upper peripheral edge portion **15** which defines attachment surfaces thereat.

The sectional hull **11** also includes a pair of side sections **16** also formed of fiberglass reinforced plastic material such as a polyester resin system and each is a mirror image of the other. It will be noted that these sections flare outwardly slightly from the stern end and then converge forwardly as at **17**. Each side section **16** substantially throughout its length is inwardly and slightly downwardly offset adjacent its lower peripheral edge to define a downwardly facing shoulder **18**, as best seen in FIG. 4, and terminates in downwardly extending peripheral edge portions **19**. These lower peripheral longitudinal edge portions define attachment surfaces which mate with the upper longitudinal attachment surfaces of the lower section **12**.

Each side section **16** also has a longitudinal upper peripheral edge portion **20** which defines attachment surfaces adjacent thereto and each side section terminates forwardly and upwardly inclined forward peripheral edge portion **21** which is disposed in engaging relation with the inclined forward peripheral edge portion of the other side section. It will be noted that the stern end of each side section **16** is inwardly offset to define a rearwardly facing shoulder or surface **22** and terminates in a vertical peripheral edge portion **23** as best seen in FIG. 1. The vertical peripheral edge portions of each side section **16** also defines an attachment surface in the manner of the other attachment surfaces described hereinabove.

The hull **11** includes a transom section **24** which as shown is of generally rectangular shaped configuration and which is also formed of fiberglass reinforced plastic material in the manner of the previously described hull sections. This transom section has forwardly turned generally vertically extending peripheral edge portions **25** each of which defines attachment surfaces for engaging the vertical attachment surfaces on the side section **16**. The transom section **24** is also offset forwardly throughout its width to define a shoulder **26** and terminates downwardly in a lower transverse peripheral edge portion **27**.

The transom section **24** is secured to the lower section **12** and the side section **16**. The hull is also provided with a reinforcing frame structure designated generally by the reference numeral **28** and comprised of a plurality of longitudinally extending frame members **29**. These longitudinally extending frame members **29** are preferably constructed of wood as are the other members of the frame structure and are secured to the upper concave surface of the lower section **12** by any suitable bonding agent such as glue or the like. The frame structure **28** also includes a plurality of transverse frame members **30** which may be notched to receive the longitudinal frame members **29** therethrough and which have transversely convex lower surfaces that engage the concave upper surface of the lower section **12** and are also secured thereto by a suitable bonding agent. Elongate upstanding side members **31** are secured at their lower ends to the ends of the transverse frame members **30** by suitable attachment means such as screws or the like and project upwardly and outwardly therefrom. It is also pointed out that the transverse frame members **30** are secured to the longitudinal frame members **29** by conventional screws or their equivalent. It is pointed out that the longitudinal and

transverse frame members of the frame structure **28** are so arranged and constructed with respect to their interlocking slots, that the transverse frame members will interlock with the longitudinal frame members in a predetermined manner. This arrangement prevents interlocking of the transverse and longitudinal frame members in an improper arrangement. It is further pointed out that the longitudinal transverse and side frame members when interconnected together to define the frame structure not only provide an attachment and supporting medium for the various sections of the hull but also serve as a means for shaping these flexible hull sections to the proper configuration.

When the boat **10** is assembled, the frame structure **28** will be that part which is first assembled and will thereafter be placed upon a supporting structure and inverted. The lower hull section **12** is then attached to the frame structure **28** by a suitable bonding agent and the side sections are thereafter secured to the lower section **12** and to the side frame members **31**. Referring now to FIG. 4 it will be seen that the upper longitudinal attachment surfaces **13** of the lower section abut against the shoulder **18** and engage the lower longitudinal attachment surfaces **19** of the side section **16**. A suitable bonding agent is applied between these interengaging surfaces, and this bonding agent may be any suitable plastic cement which is compatible with the polyester system from which the various sections of the sectional hull are made. The interengaging attachment surfaces between the lower section and side sections are also interconnected together by suitable securing means such as rivets **32**. An elongate fiberglass strip or mat **33** impregnated with a compatible plastic bonding agent is applied to the interior of the lapped joint between the attachment surfaces of the lower and side sections to form a water tight seal thereat and to increase the strength of the structure along this joint.

The bonding agent is also applied to the interengaging peripheral edge portions **21** and to the interengaging attachment surfaces between the lower, side and transom sections. To this end it is pointed out that the vertical peripheral portions **23** are positioned within the vertical peripheral portions **25** of the transom section **24** so that the exterior surface of each side section is coplanar and continuous with the exterior surface of each forwardly turned peripheral edge portion **25**. The lower transverse peripheral edge portion **27** of the transom section **24** is positioned interiorly or forwardly of the stern portion **14** of the lower section **12**, the respective attachment portions interengaging each other. Thus the rear or exterior surface of the transom section **24** is coplanar with the exterior or rear surface of the stern portion **14**. The bonding agent together with suitable rivet means very effectively secures the transom section to the side sections and the lower section. Suitable elongate resin impregnated fiberglass strips may be applied to the interior surface of these interengaging attachment surfaces of the transom, side and lower sections to form a water tight seal thereat.

Although the inclined front peripheral edges **21** of the side sections are interconnected together by a suitable bonding agent, these interengaging agents may be retained in engaging relation by suitable strips of tape or other material. Further in order to produce not only a water seal at the bow of the boat, but also to produce an extremely strong joint thereat, an elongate generally channel-shaped joint member **34** is provided and overlaps the interengaging peripheral edges **21** and is secured to the side section by the compatible plastic bonding agent. It is pointed out that this joint member **34** is also constructed of fiberglass reinforced plastic material and not only overlaps the interengaging inclined peripheral edges **21** of the side sections but extends downwardly beyond these overlapped edges and engages the front or lower forward portion of the lower section **12** and is attached thereto by the bonding agent.

The boat **10** may also include a deck section **35** as best seen in FIGS. 3 and 5 and the deck section is comprised of a pair of deck members **36** each being the mirror image of the other and each being constructed of a fiberglass reinforced plastic material such as a polyester resin system. Each deck member **36** includes a forward or low portion **37** and an elongate rearwardly extending portion **38** integrally formed therewith. Referring now to FIG. 3 it will be seen that the outer longitudinal marginal portion of each deck member **36** is offset upwardly as at **39** then extends outwardly at **40** and terminates in a downturned peripheral edge portion **41** which defines an attachment surface thereat. It will be seen that the channel-shaped marginal portion of each deck member receives the longitudinal upper peripheral edge portion **20** of one of the side sections therein. The longitudinal attachment surface of each deck member is disposed in engaging relation with the upper longitudinal attachment surface of the associated side member and is secured thereto by a suitable bonding agent and other additional securing means such as rivets, screws or the like.

The exterior surface of the deck may also be provided with a molding **42** which extends throughout the longitudinal length thereof and a suitable resin impregnated elongate fiberglass strip **42***a* may be bonded to the interior surfaces of each side section and deck member adjacent the joint thereof as best seen in FIG. 3.

It will also be noted that the deck members **36** each have an inner longitudinal edge portion **43** which define attachment surfaces thereat, these attachment surfaces being disposed in engaging relation with respect to each other and secured together by the compatible bonding agent.

Referring now to FIG. 6 it will be seen that a slightly modified form of the sectional boat is there shown and is designated generally by the reference numeral **10***a* and includes a sectional hull **11***a* in the manner of the embodiment of FIGS. 1–5. Although the reinforcing frame structure has not been illustrated in conjunction with the embodiment of FIG. 6, it is pointed out that this embodiment will also be provided with such a reinforcing frame structure.

The sectional hull **11***a* includes the lower section **12***a* which is comprised of a pair of lower section members **12***b* each comprising the mirror image of the other. The lower section **12***a* when assembled will have substantially the same configuration as that of the lower section of the embodiment of FIGS. 1–5 and is also formed of fiberglass reinforced plastic material such as polyester systems. The various other sections of the boat **10***a* are also constructed of fiberglass reinforced plastic material and it will be noted that each lower section **12** has an outer or upper longitudinal edge portion **13***a* and an inner or lower longitudinal peripheral edge portion **13***b*, both peripheral edge portions defining attachment surfaces. The rear or stern end of each lower section member **12***b* has an upturned stern portion **14***a* which terminates in an outturned substantially flat peripheral edge portion **14***b* which defines an attachment surface. It will be noted that when the sections **12***b* are interconnected together in mating relation, the transverse attachment surfaces **14***b* are of upwardly concave configuration.

The side sections **16***a* are identical in construction to the side sections **16** and each converges forwardly as at **17***a* and each section includes a longitudinally extending shoulder **18***a* which terminates in a lower longitudinal edge portion **19***a*. Each side section also has a longitudinal upper peripheral edge portion, a rearwardly facing shoulder **22***a* and rear vertical peripheral edge portions **23***a*. The various peripheral edge portions define attachment surfaces in a manner of the embodiment of FIGS. 1–5. A transom section **24***a* is provided having forwardly turned peripheral edge portions **25***a* and an inturned lower transverse peripheral edge portion **27***a*. It will be noted that the transversely extending peripheral edge portion **27***a* is of downwardly convex configuration and mates and

engages the peripheral edge portions **14***b*. The peripheral edge portions **23***a* of the side section **16***a* are received inwardly of the peripheral edge portions **25***a* in the manner of the embodiments of FIGS. 1–5.

All of the interengaging attachment surfaces of the hull **11***a* are secured together by a suitable bonding agent which is compatible with the resin system, and additional securing means such as rivets or screws may be used to secure the side sections to the lower section and also to secure the transom section to the side sections and lower sections. An elongate fiberglass strip or mat may be provided interiorly of the joints between each of the sections to provide a water tight seal thereat and to substantially reinforce the joints.

An elongate generally channel-shaped joint member **34***a* is provided and this joint member is of substantially identical construction to the joint member **34** and overlaps the inclined interengaging forward peripheral edge portions **21***a*. In order to provide a highly effective water sealed joint between the lower sections **12***a* and **12***b* and elongate channel-shaped joint member **34***b* is provided and this joint member **34***b* is also formed of fiberglass reinforced plastic material and underlies and overlaps the peripheral edge portions **13***b* and is secured to the lower section members **12***b* by a suitable bonding agent. The adjacent ends of the joint members **34***a* and **34***b* abut each other so that a continuous joint structure is defined. It is again pointed out that an elongate strip of resin impregnated fiberglass may be applied to the interior of the lower section **12***a* along the joint between the respective members thereof. As pointed out above, the boat **10***a* will also be provided with a supporting framework identical in construction to that illustrated in the embodiments of FIGS. 1–5, may also be provided with a deck section. The deck section **35** will be applied to the side sections in the identical fashion of the embodiments of FIGS. 1–5.

It will be seen that through the use of a sectional boat structure in which the various parts are preformed of a molded fiberglass reinforced plastic material, a relatively large boat such as a cruiser may be sold in kit form and all of the parts thereof may be assembled into a package of relatively small compass with respect to the width and depth dimension of the package. The package will, of course, have a length corresponding to the length of the boat and it has been found that packages for cruisers of thirty feet length may be very conveniently and economically transported or otherwise handled. The entire kit may be assembled in a minimum of time with a minimum of effort by one who has little or no skill in the art of boat making. By preforming the various sections of fiberglass reinforced plastic material, these sections may be of light weight construction but have strength characteristics at least equal to if not greater than the conventional cruisers which are constructed of wood.

It will, therefore, be seen from the foregoing paragraphs that I have provided a novel and unique boat structure which is not only of simple and inexpensive construction but one which may be economically handled and easily assembled.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportion of the various parts without departing from the scope of my invention.

What is claimed is:

1. A sectional boat kit adapted for ready assembly and including a lower section formed of molded fiberglass reinforced plastic material and having a concave upper surface and having a convex lower surface, said lower section defining the bottom portion of the boat hull, said lower section having longitudinal upper peripheral edges converging forwardly towards the bow end of the boat, and having a transverse upper peripheral edge extending between said longitudinal edges at the stern end of the boat, each of said peripheral edges defining attachment surfaces thereat, a pair of side sections each being substantially the mirror image of the other and each being formed of molded fiberglass reinforced plastic material said side sections defining the sides of the boat hull and each of said side sections having a generally horizontally longitudinally extending upper peripheral edge, a lower peripheral edge, an inclined front peripheral edge and a vertical rear peripheral edge, each of said peripheral edges defining attachment surfaces thereat, said side sections converging forwardly so that the front peripheral edges are disposed in engaging relation with respect to each other, the lower longitudinal attachment surfaces of the side section engaging the upper longitudinal attachment surfaces of the lower section, a transom section having substantially vertical peripheral edges and a lower transverse peripheral edge, each of said last mentioned edges defining attachment surfaces thereat, the vertical attachment surfaces of said transom section engaging the rear vertical attachment surfaces of said side sections and said lower transverse attachment surface on said transom section engaging the upper transverse attachment surface of said lower section, means sealingly securing all of said interengaging attachment surfaces together, a deck section comprised of a pair of deck members each being formed of fiberglass reinforced plastic material each being mirror images of the other, each of said deck members attachment surfaces thereon engageable with the upper longitudinal attachment surfaces of the side sections, and means sealingly securing said last mentioned interengaging attachment surfaces together, a frame structure comprised of a plurality of longitudinal frame elements extending longitudinally of the hull, a plurality of transverse frame elements engaging the longitudinal frame elements and extending transversely thereof, a plurality of elongate upstanding side frame elements each having its lower end secured to one of said transverse and longitudinal frame elements, said side frame elements projecting upwardly along both sides of said frame structure, said lower and side sections being secured to said frame structure and retained in properly contoured relation thereby, and an elongate generally channel-shaped joint member formed of fiberglass reinforced plastic material being disposed in overlapping relation with respect to the interengaging forward attachment surfaces on said side sections and being sealingly secured thereof by adhesive means.

2. The boat structure as defined in claim **1** wherein the transverse attachment surface on the lower section is of upwardly concave configuration, and the transverse attachment surface on said transom member is of downwardly convex configuration.

3. A sectional boat kit adapted for ready assembly and including a lower section formed of molding fiberglass reinforced plastic material and defining the bottom portion of the boat hull, said lower section comprised of a pair of elongate members each having a lower longitudinal peripheral edge, said last mentioned longitudinal edges engaging each other, the joint defined by said lower longitudinal edges of said lower section members falling within the vertical center line plane of the boat, an elongate channel-shaped joint member engaging the lower surface of said lower section members and overlapping the interengaging lower longitudinal edges thereof, means sealingly securing said joint member to said lower section members, said lower section members each having an upper longitudinal peripheral edge converging forwardly toward the bow end of the boat and having a transverse upper peripheral edge extending between said upper and lower peripheral edges at the stern end of the boat, each of said peripheral edges defining attachment surfaces thereat, a pair of side sections each being substantially the mirror image of the other and each being formed of molded fiberglass reinforced plastic material, said side sections defining the side of the boat hull and each of said side sections having a generally horizontally longitudinally extending upper peripheral edge, a

lower peripheral edge, an inclined front peripheral edge and a vertical rear peripheral edge, each of said peripheral edges defining attachment surfaces thereat, said side sections converging forwardly so that the front peripheral edges are disposed in engaging relation with respect to each other, the lower longitudinal attachment surfaces of the side sections engaging the upper longitudinal attachment surfaces of the lower section, a transom section having substantially vertical peripheral edges and a lower transverse peripheral edge, each of said last mentioned edges defining attachment surfaces thereat, the vertical attachment surfaces of said transom section engaging the rear vertical attachment surfaces of said side sections and said lower transverse attachment surface on said transom section engaging the upper transverse attachment surface of said lower section, means sealingly securing all of said interengaging attachment surfaces together, a deck section comprised of a pair of deck members each being formed of fiberglass reinforced plastic material and each being mirror images of the other, each of said deck members having attachment surfaces thereon engageable with the upper longitudinal attachment surfaces of the side sections and means sealingly securing said last mentioned interengaging attachment surfaces together, and an elongate generally channel shaped joint member formed of fiberglass reinforced plastic material being disposed in overlapping relation with respect to the interengaging forward attachment surfaces on said side sections and being sealingly secured thereto by adhesive means.

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MILTON BUCHLER, *Primary Examiner.*

R. A. DORNON, *Assistant Examiner.*