Jan. 26, 1954 H. ENGENSPERGER 2,666,933

SECTIONAL BOAT

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Fig. 1



Fig. 2

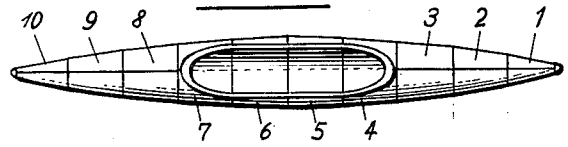


Fig. 3

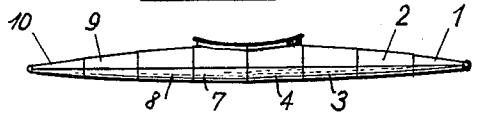


Fig. 4

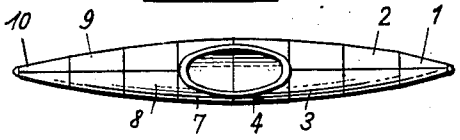


Fig. 5

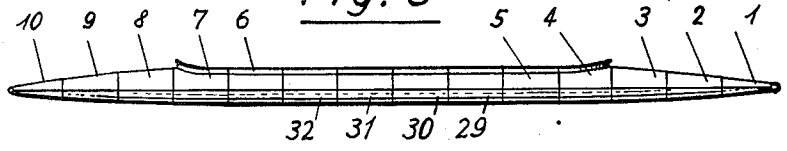
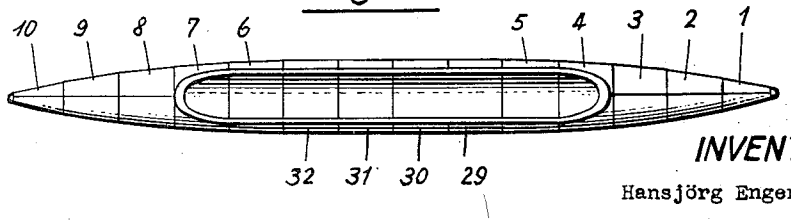


Fig. 6



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SECTIONAL BOAT

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Fig. 9

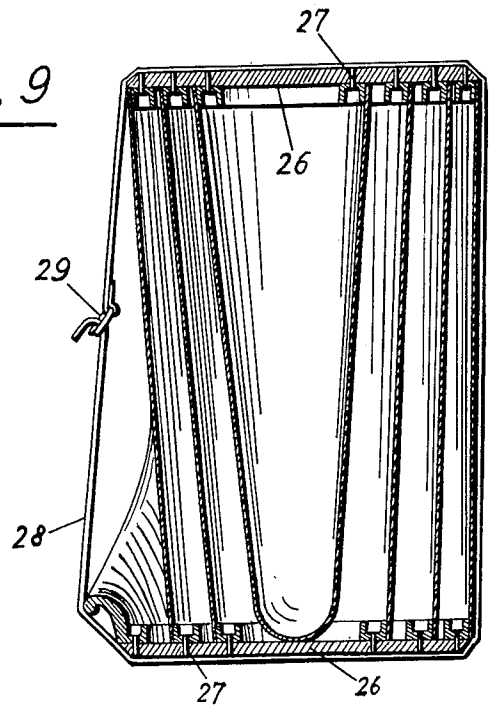
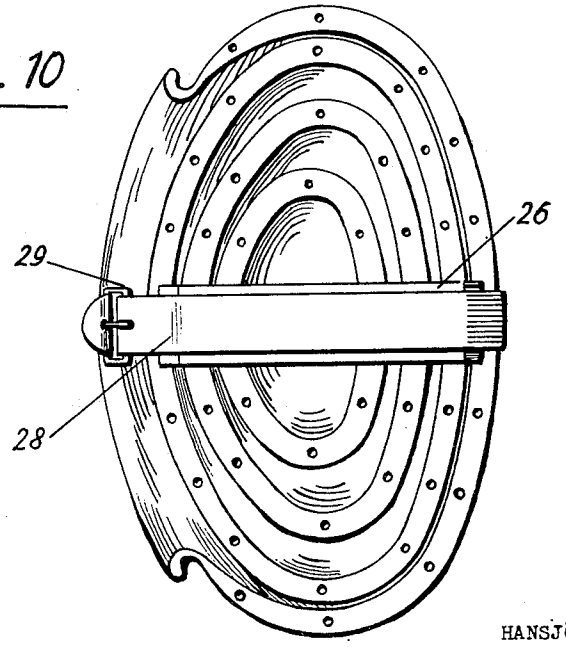


Fig. 10



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SECTIONAL BOAT

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Fig. 7

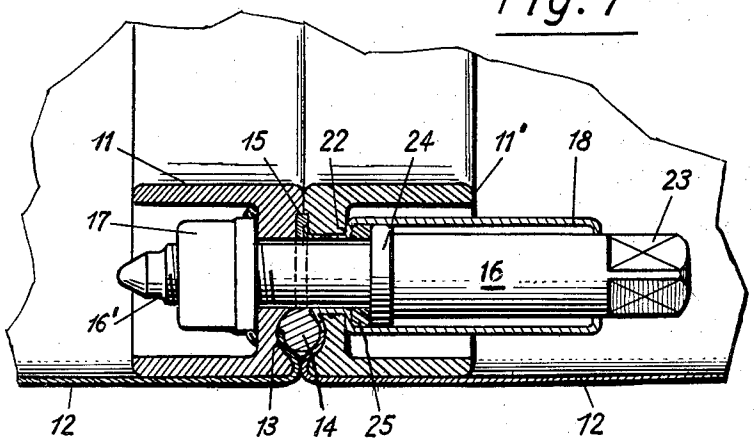
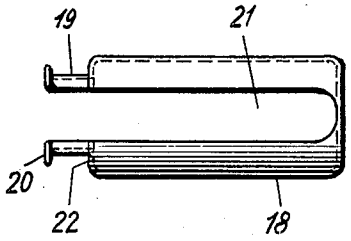


Fig. 8



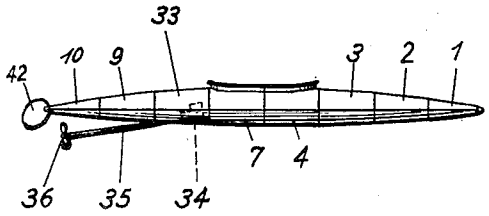
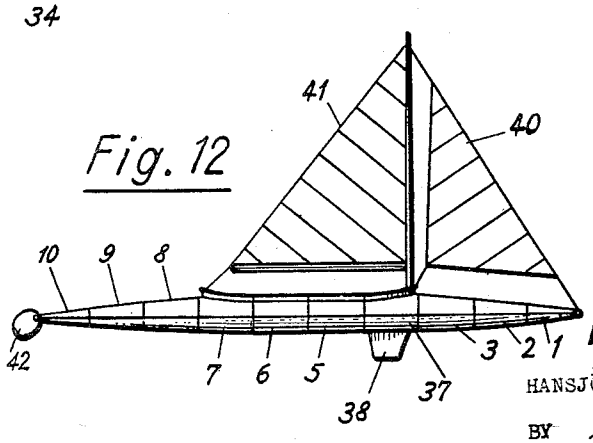


Fig. 11

Fig. 12



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SECTIONAL BOAT

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Application December 1, 1950, Serial No. 198,513

4 Claims. (Cl. 9—2)

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The present invention relates to a sectional boat having a rigid hull and consisting of a plurality of individual sections which can be conveniently connected and separated.

An object of the present invention is the provision of a boat, more particularly a sport boat, consisting of a plurality of individual transverse sections which are obtained by splitting cross ribs in a plane transverse to the longitudinal axis of the boat, the sections being formed by distal halves of cross ribs interconnected by rigid hull portions and having such a shape that, upon disassembly of the boat, individual rigid sections can be nested one into another for transport purposes.

It is a further object of the invention to provide improved joint means for disconnectably interconnecting the halves of cross ribs which are proximal when the sections of a boat as set forth in the paragraph next above are in normal operating position.

The length of the boat according to the invention can be varied by interconnecting a greater or lesser number of transverse sections.

Water-tightness of the joints between adjacent cross rib halves is obtained by inserting a strand of packing in a groove in the face or faces of one or both adjacent cross rib halves, which strand projects from the grooves in the direction of the longitudinal axis of the boat before the neighboring rib halves are tightened together, for example, by screws. The latter are constructed for attachment to one of the rib halves so that they cannot be lost. The packings and adjoining surfaces of rib halves are so constructed that the surfaces abut upon tightening of the screws and the packings have no part in transmitting stresses when the boat is in normal use.

Further and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims, and shown in the drawings which, by way of illustration, show what I now consider to be preferred embodiments of my invention.

In the drawings:

Fig. 1 is a side view of a sectional boat according to the invention designed for two persons;

Fig. 2 is a plan view of the boat according to Fig. 1;

Fig. 3 is a side view of the boat illustrated in Figs. 1 and 2 with the center sections removed so that it seats one person;

Fig. 4 is a plan view of the boat shown in Fig. 3;

Fig. 5 is a side view of a boat according to the invention elongated to accommodate four persons by the insertion of additional center sections;

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Fig. 6 is a plan view of the boat shown in Fig. 5;

Fig. 7 is a large scale part sectional view of a means according to the invention for joining adjacent boat sections;

Fig. 8 is a side view of a part of the means illustrated in Fig. 7;

Fig. 9 is an axial longitudinal section of a unit of nested boat sections packed for transport;

Fig. 10 is a plan view of the unit illustrated in Fig. 9;

Fig. 11 is a side view of a motorized boat according to the invention;

Fig. 12 is a side view of a sailboat according to the invention.

Like parts are designated by like numerals in all figures of the drawings.

Referring more particularly to Figs. 1 and 2 of the drawings, the boat whose hull may be made of light sheet metal consists of transverse sections 1 to 10, which are disconnectably connected. A flange 11 is provided at each end of a section, as can be seen in Fig. 7. The section of the flange has the shape of a U whose legs extend in the direction of the longitudinal axis of the boat and toward the center of their respective boat section. The webs of adjacent flanges abut one another when the boat is assembled and have substantially semicircular grooves 13 at their outer faces and in the neighborhood of the outside of the boat, the axial ends of the hull material 12 being bent around the outer edges of the flanges and into the grooves 13. A strand 14 of packing material, for example rubber, is inserted in the grooves 13. The cross-section of the uncompressed strand 14 in the longitudinal axial direction of the boat is greater than the combined depths of two adjacent grooves 13 whereas its section transverse to the longitudinal axis of the boat is not greater than the width of the grooves. A lateral extension or flap 15 extends from the strand 14 toward the interior of the boat in a suitable recess of the end face of at least one flange and is connected to one flange to avoid loss of the packing when the boat is disassembled.

As seen in Fig. 7, nut portions 17 are provided on the inside of the web portion of one of the flanges 11 for receiving the threaded ends 16' of bolts 16 which extend from the adjacent flange 11' through apertures in the flap 15 and in the web portion of the flange provided with the nut portions 17. The bolts are axially slidable in sleeves 18 which are removably attached to flange 11' and are separately shown in Fig. 8. The sleeves have a neck portion 19 terminating in an outwardly extending rim 20 at one end and can

be compressed radially due to the provision of diametrically opposed slots 21 to permit insertion in suitable apertures in the web portion of flange 11'. Upon release of the radial compression, the neck portion 19 abuts the interior of the aperture, axial movement of the sleeve being prevented by the rim 20 at one end and a shoulder 22 at the other end of the neck portion. The far end of sleeve 18 is closed except for an aperture to form a throat through which extends the bolt 16. The latter has a collar 24 preventing removal of the bolt from the sleeve 18 unless the portions of the sleeve divided by the slots 21 are bent far apart. When it is desired to remove a sleeve with its bolt from a cross rib formed by two adjacent flanges, the bolt must be unscrewed from the nut portion 17 and moved all the way to the right in Fig. 7 to permit radial compression of the sleeve. For connecting adjacent flanges, the neck portions of the sleeves are inserted into holes in one flange and the bolts are moved to the left and screwed into the nut means 17 of the adjacent flange and tightened thereinto and against lock washers 25 by applying a suitable key to the square ends 23 of the bolts. The threaded ends 16' of the bolts 16 are preferably provided with a point to facilitate insertion of the bolts into the apertures of the flange 11 and into their respective nuts. When the boat is disassembled, the threaded end of the bolt is in the sleeve 18 and protected against dirt and damage.

Because of the aforedescribed configuration of the packing 14, the end faces of the flanges 11 and 11' abut one another upon tightening of the joints and all mechanical stresses are absorbed by the cross ribs and connecting bolts; the packings are used exclusively for caulking and do not transmit mechanical forces. Instead of providing a packing groove on each of two adjacent flanges, a correspondingly deeper groove may be provided on the end face of one flange only without departing from the scope of the present invention. It is important, however, that the depth of the groove be smaller than the thickness of the packing in the direction of the longitudinal axis of the boat and that the groove be substantially as wide as the packing.

For facilitating transportation of the disassembled boat, the individual sections are so formed that they can be nested one into another. The boat is preferably shaped symmetric with respect to a central transverse plane, the bow half and the stern half comprising an equal number of transverse sections which, when nested, form two conveniently transportable units. If the bow part is not symmetric to the stern part, the sections can be so made that all sections can be nested to form one transportable unit. The latter embodiment is more expensive and the transportable unit is heavier than if the stern and bow parts form symmetric halves of the boat.

All individual sections have the same length and their end faces are located in planes when the sections are nested for transport. As shown in Figs. 9 and 10, locking tie means are provided comprising flat members 26 placed over the end faces of the nested sections, each member having a plurality of studs fitting into the holes of the flanges, for holding the sections in predetermined positions and in spaced relation to one another for avoiding damage during transport. A belt 28 is laid along the outside of members 26 and around a unit of nested sections. The ends of the belt are connected by a conventional belt buckle 29. Additional belts or straps may be provided in the conventional manner for carrying a unit or pack on the back of a person.

To avoid removal of bolts 16 and sleeves 18 from the flanges to make room for the studs 27, members 26 may be provided with holes and the bolts 16 may be used for connecting the flanges to the flat members 26. The latter may be sufficiently large to cover entirely the end faces of the nested units, if desired. Instead of studs 27, protuberances may be provided on members 26 extending between the flanges and acting as spacers.

By omitting the two central sections 5 and 6 of the two-seater boat illustrated in Figs. 1 and 2, a one-seater boat, as shown in Figs. 3 and 4, is obtained. Since the individual sections taper toward the ends of the boat, the greatest width of the boat according to Figs. 3 and 4 is smaller than that of the boat shown in Figs. 1 and 2.

A boat seating four persons in a row, as shown in Figs. 5 and 6, may be obtained by inserting additional sections 29, 30, 31 and 32 between sections 5 and 6 of the boat shown in Figs. 1 and 2. The hull of the additional sections preferably extends parallel to the longitudinal axis of the boat, as otherwise the boat would become too wide.

Individual sections of a boat according to the invention may be replaced by sections comprising propulsion means. In the modification shown in Fig. 11, section 8 of the boat according to Figs. 1 and 2 is replaced by section 33 having a motor 34 mounted therein driving by means of a shaft 35, which is located in the longitudinal median plane of the boat, a propeller 36. For assuring good propelling efficiency, shaft 35 is diverted only slightly from the longitudinal axis of the boat. It is obvious that the location of the motor and propeller in a boat according to the invention is superior to the conventional mounting on the side of a boat or at the stern which is inaccessible in a kayak-type boat. The motor of the boat according to the invention is easily accessible and is located so low and close to the center of the boat that its weight improves stability.

In the embodiment shown in Fig. 12, the section 4 of the two-seater shown in Figs. 1 and 2 is replaced by a section 37 comprising a retractable centerboard 38 and mountings for a mast 39 for rigging a jib 40 and a mainsail 41. A rudder 42 is mounted on the stern section 10 or may be connected with an intermediate section in conventional manner.

Preferably, the ends of at least the bow and stern sections are closed hermetically to provide buoyancy if the boat capsizes. The other sections are open at least at one of their ends to provide accessibility to the connecting means, as the bolts 16. The open ends may be closed by removable bulkheads.

While I believe the above described embodiments of my invention to be preferred embodiments, I wish it to be understood that I do not desire to be limited to the exact details of design and construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. A sectional boat comprising a plurality of individual transverse sections, flange means at the ends of each section, coaxial apertures in the adjacent flange means of two neighboring sections when the boat is assembled, sleeve means individually having a neck portion at one end, said neck portions being individually inserted in the apertures of and connected with one of the adjacent flange means, said sleeve means having

a throat at the end opposite the end having the neck portion, a bolt in each of said sleeve means having one end extending outside of the sleeve means through said throat, the other end of said bolt being threaded and extending outside of the sleeve means through the end having the neck portion, a collar on said bolt inside said sleeve means, said collar having an outside diameter greater than the diameters of said throat and of said neck portion and preventing removal of said bolt from said sleeve means, and internally threaded portions connected with and adjacent to the apertures of the flange means adjacent to the flange means into the apertures of which the sleeve means are inserted, said internally threaded portions individually receiving the threaded ends of said bolts.

2. A sectional boat as set forth in claim 1, the ends of said sleeve means which are individually inserted with their neck portions in the apertures of one of said flange means having an outwardly extending rim preventing withdrawal of the sleeve means from the apertures in which they are inserted.

3. A sectional boat as set forth in claim 2, having an axial slot in each sleeve means extending from the end having the neck portion and affording compression of the necked end portion for insertion and removal of the sleeve means into and from the apertures.

4. A sectional boat comprising a plurality of individual transverse sections, flange means at the ends of each section, a groove in at least one of two adjacent flange means of two neighboring sections when the boat is assembled, and a packing strand laid in said groove, said strand having a lateral projection extending outside of said groove and being permanently connected with one of said flange means.

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