Aug. 10, 1954 T. T. MURFAY 2,685,695

COLLAPSIBLE BOAT

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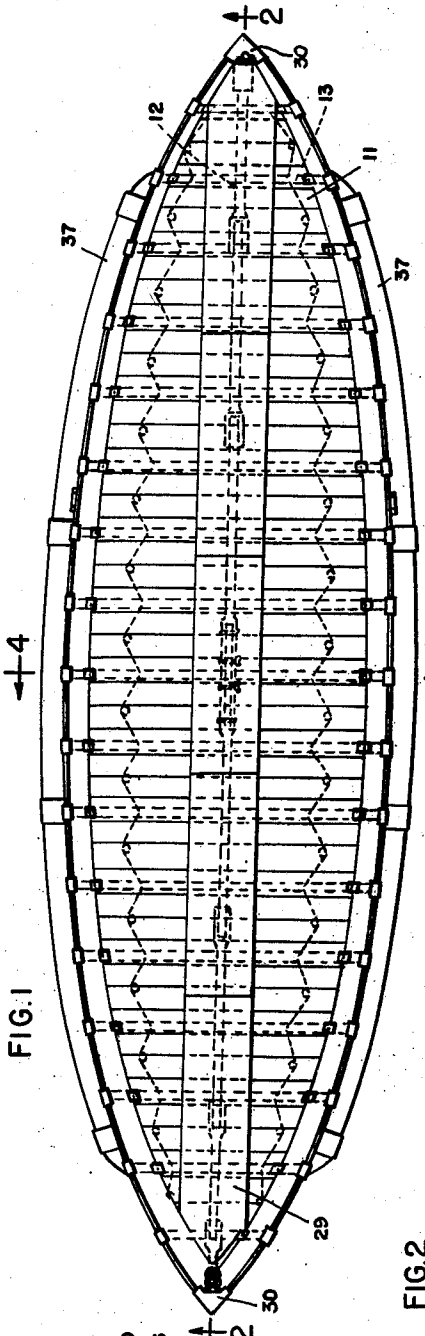


FIG. 1

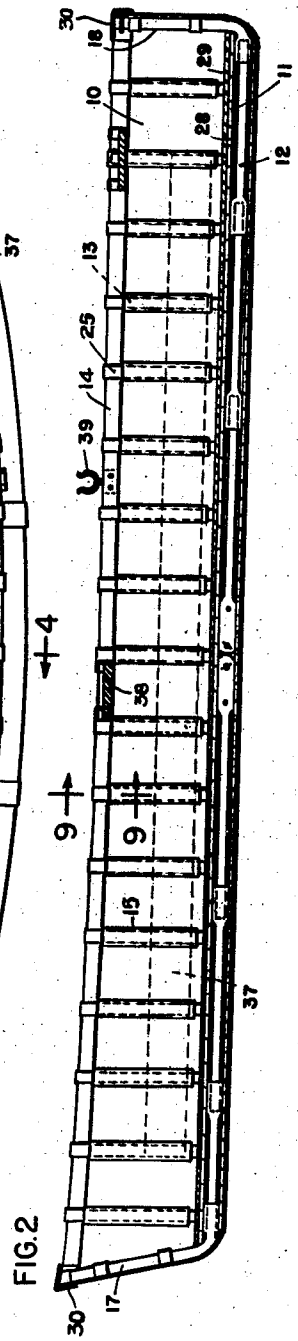


FIG. 2

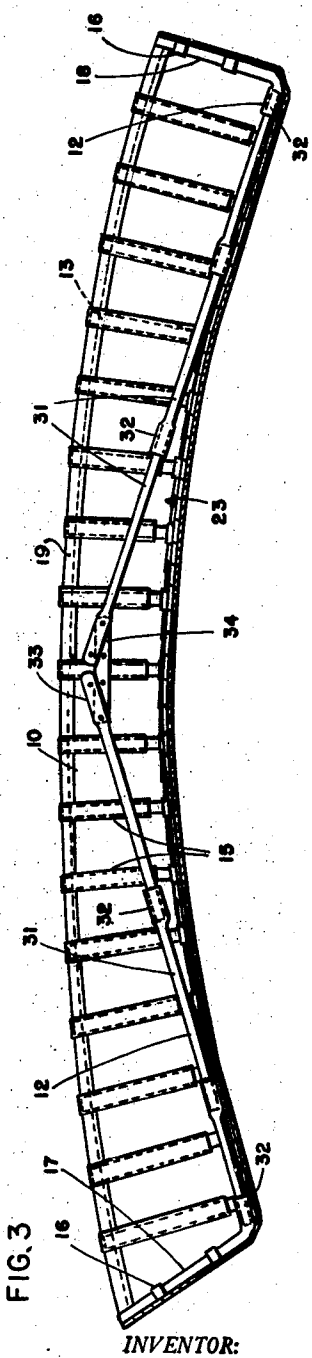


FIG. 3

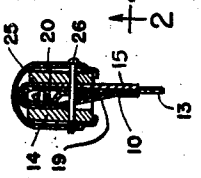


FIG. 9

INVENTOR:
TEDDY T. MURFAY

BY Rummler Rummler & Snow
ATT'YS

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FIG. 4

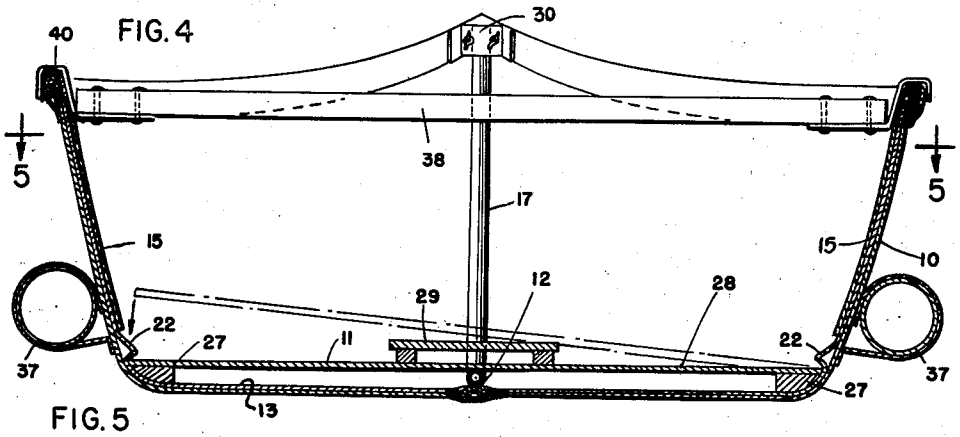
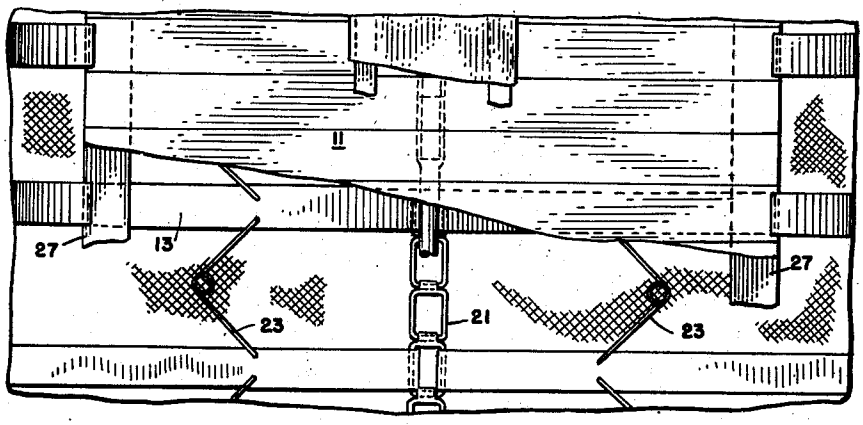


FIG. 5



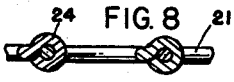
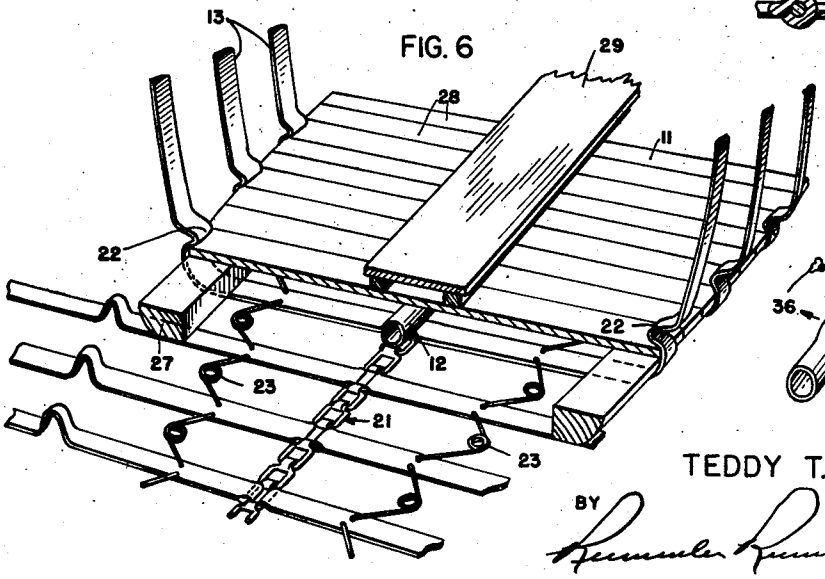


FIG. 8

FIG. 6



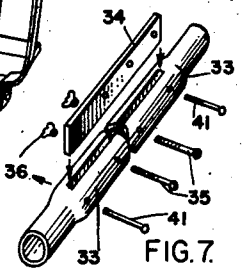


FIG. 7.

INVENTOR:

TEDDY T. MURFAY

BY

Kenmuler Kenmuler & Snow

ATT'YS

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COLLAPSIBLE BOAT

Teddy Terry Murfay, Chicago, Ill.

Application October 20, 1950, Serial No. 191,290

1 Claim. (Cl. 9—2)

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This invention relates to improvements in collapsible boats.

The main objects of this invention are to provide an improved form of collapsible boat of the type shown in my Patent No. 1,605,970; to provide an improved form of sectionally expansible keel; to provide an improved form of flexible stiffening rib for the covering for securing a boat bottom in place; and to provide an improved collapsible boat of this kind, the overall form of which is less expensive to construct, more secure in its assembled form for use as a boat, and easier to assemble and disassemble than the structure shown in the aforesaid patent.

In the accompanying drawings:

Figure 1 is a perspective view of an improved form of boat constructed in accordance with this invention, the boat being shown in its expanded form for use in the water.

Fig. 2 is a longitudinal sectional elevation of the same taken on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 but showing the sectional keel as it is disposed preparatory to being shifted in position to secure the covering in its stretched form, as shown in Figs. 1 and 2.

Fig. 4 is an enlarged, transverse, sectional elevation taken on the line 4—4 of Fig. 1, showing in dotted outline the floor boards in the process of being placed in position.

Fig. 5 is a further enlarged, fragmentary, plan of the bottom of the boat, portions of the tread member and the bottom boards being broken away to more clearly show the forms and connections of the underlying parts.

Fig. 6 is an enlarged, fragmentary, perspective showing the form and relative arrangement of stiffening ribs and the attachment thereto of the bottom boards of the boat.

Fig. 7 is an exploded view of the opposed ends of the keel whereby the keel sections are secured in their extended axial alinement for stretching the boat covering.

Fig. 8 is a fragmentary view showing the hook form of the links for the chains which are used to attach the flexible ribs together along the keel and along the gunwales, and

Fig. 9 is an enlarged, fragmentary, cross-sectional view of one of the gunwales, as viewed from the plane of the line 9—9 of Fig. 2.

The particular embodiment of this invention, shown in the accompanying drawings, comprises a reinforced stretchable covering 10, a foldable floor 11, and a sectionalized toggle-like keel 12. These parts are all so formed that when disassembled they may be compactly arranged for storage or transport and subsequently may be

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easily assembled to form a light but rigid water craft.

The covering 10 is fabric material reinforced by transverse flexible stiffening ribs 13 and inner and outer gunwale stiffeners 14. The fabric preferably is canvas which is treated to render it impervious to water. A sheet of such fabric is cut to suitable form and united at the ends so as to appropriately fit around the assembled floor 11 and the extended keel 12. At points intermediate its ends and transversely thereof the covering 10 has strips 15 of similar fabric stitched thereto to form pockets to receive the ribs 13. At its ends the covering 10 has straps 16 attached for receiving stem and stern posts 17 and 18, respectively. Along its lateral edges the fabric is folded upon itself (see Fig. 9) to provide pockets 19 for the gunwale chains 20, which connect the outer ends of the ribs 13, and gunwale stiffeners 14.

The stiffening ribs 13 are flat, spring-metal strips looped at their inner and outer ends to embrace links on the aforesaid gunwale chains 20 and a keel chain 21 disposed longitudinally of the covering 10. Intermediate their ends these ribs 13 are bent to form inwardly disposed offsets 22, by means of which the floor 11 is retained in place. The ribs 13 are inserted in the pocket strips 15 with the rib offsets 22 extending out through openings in said strips, as is most clearly shown in Fig. 4.

V-shaped compression springs 23 comprising medial helical coils with angularly disposed arms connected to the ribs 13 so as to normally spread said ribs apart and expand the covering 10 to receive the keel 12 and floor 11. The chains 20 and 21 are most clearly indicated in Figs. 5, 8 and 9. Each link is of rectangular form with a hook 24 at one end, which snaps over and pivots on the opposite end of an adjacent link.

The gunwale stiffeners 14 are of a form and material as set forth in the aforesaid patent. These comprise comparatively short pieces of any suitable material, preferably wood. The sections are oppositely hinged together at their ends so as to fold upon one another accordian-like, compact for storage or transport, or to be extended end to end in alinement for use in reinforcing the gunwales of the covering 10. These stiffeners 14 are secured along the inner and outer sides of the pockets formed along the lateral edges of the covering 10 to house the gunwale chains 20. Inverted U-clips 25 and bolts 26 embrace and connect the gunwale strips 14 and ribs. The ends of the gunwale strips 14 are connected to the stem and stern posts by fittings 30.

The floor 11 comprises a pair of side keelsons

27, a plurality of bottom boards 28, and a tread member 29.

Like the gunwale stiffeners 14, the side keelsons may be made up of a number of segments appropriately joined as described in said patent. The outer sides of these side keelsons 27 are rounded transversely and curved longitudinally to conform to the bottom curvature of the boat at the floor level. As indicated in Figs. 4 and 6, these side keelsons rest upon the ribs 13 inwardly of and below the rib offsets 22, with the ends of certain of the bottom boards 28 resting on the side keelsons and releasably interposed between the keelsons 27 and the rib offsets 22. As shown in Fig. 6, the ribs 13 extend flatwise between the keelsons 27 and the offsets 22 overlap the floor boards so as to resiliently clamp the keelsons and the floor boards together in place on the ribs.

As with the construction shown in the aforesaid patent, the floor boards 28 are of gradually decreasing length from the center of the boat toward the stem and stern. The boards are so dimensioned that every third board overlies a stiffening rib 13 of the cover 10. Each such board is releasably held in place on the keelsons 27 under the rib offsets 22. As shown in the aforesaid patent, these floor boards may be oppositely hinged together along their lateral edges so that, as with other similar parts hereinbefore described, they may be folded accordion-like for storage or transport, or extended in alinement, as shown in the drawings.

The tread member 29, like other boat-length parts, is made up of sections oppositely hinged so as to fold one upon another or be extended as transport or storage or boat use requires.

The keel 12 comprises two groups of sections 31, one end of each of which sections, except for the innermost terminal section of each group, is formed with a socket 32 into which fits the end of the next adjacent section 31. The stem and stern posts 17 and 18 are likewise formed at their inner ends with angularly-disposed sockets 32 into which fit the ends of the outer terminal keel sections 31. All of these parts preferably are formed of tubing.

The inner terminal sections 31 of the keel 12 have their opposed ends enlarged, as shown at 33, and bifurcated to receive a link 34 by which the two groups of keel sections 31 are extended and locked into axial relationship, for stretching the covering 10. The link 34 is pivoted to the respective inner terminal keel sections 31 by pins 41. Bolts 35, with wing nuts 36 (see Fig. 7), secure the link 34 to the bifurcated ends 33 of the opposed keel sections 31 for holding the two groups of keel sections in axial alinement.

As with the construction disclosed in the aforesaid patent, this boat may be provided with the usual air-inflated sponsons 37, one or more seats 38, and oar locks 39.

The sponsons 37 are arranged along the sides of the covering 10 approximately at the water line. They are provided with suitable valve stems for the attachment of inflating means. Such sponsons serve to stabilize the boat and render it practically non-sinkable.

The seats 38 are usually in the form of planks, to the ends of which are attached hooks 40, which set over the gunwales, as shown in Fig. 4.

The oar blocks 39 are of usual construction, being set in suitable sockets on the gunwales to permit their turning.

The boat is assembled by spreading out the covering 10, the stiffening ribs 13 being permanently

retained in the pocket strips 15 and the springs 23 tending to spread the ribs apart. The stem and stern posts 17 and 18 are inserted under the straps 16, whereupon the two groups of sections 31 of the keel 12 are assembled with the ends of the outer terminal sections 31 set in the socket ends 32 of the stem and stern posts 17 and 18 and oppositely disposed angularly to the normal longitudinal axis of the boat, as shown in Fig. 3. The link 34 has the pivot pins 41 inserted to secure the link to the opposed ends of the inner terminal keel sections 31, whereupon the two groups of keel sections are pressed down radially into axial alinement. This stretches the covering 10, which stretching is facilitated by the tendency of the springs 23 to push the stiffening ribs 13 into the fartherest possible spaced relationship with each other. The two groups of keel sections are secured in such axial alinement by the insertion of the bolts 34 and the tightening up of the wing nuts 36. Such stretching of the covering 10 brings the lateral portions of the covering 10 into transverse gunwale position with respect to the bottom portion of the covering The gunwale stiffeners 14 are then attached along the inner and outer sides of the pockets 19 and secured by the clips 25 and bolts 26. (See Fig. 9.) The ends of the gunwale strips 14 are secured to the stem and stern posts by the fittings 30.

At this stage of the assembling operation the resilient spring ribs expand the covering 10 to a rough approximation of the boat's shell form. The final shell contour is established by the side keelsons 27 in their relation to the keel 12, the stem post 17 and the stern post 18.

The side keelsons 27 are then unfolded and laid in place on the covering 10 with their ends abutting against the stem and stern posts and with their sides pushed down below the rib offsets 22. Next the floor boards 28 are unfolded and one end of each board which is to overlie a transverse flexible rib 13 is set in place on top of one of the keelsons 27 under the opposed rib offsets 22 (see Fig. 4). The opposite ends of the respective boards, overlying the stiffening ribs 13, are pressed down against the rib offsets 22, which due to the cam formation of their upper portions, yield sufficiently to permit the ends to underpass the offset and rest upon the other keelson 27, the lower portions of these rib offsets 22 forming shoulders for holding the respective boards in place, as clearly indicated in Fig. 4.

These operations completed, the tread board 29 is placed on the floor boards 28 and fastened thereto by suitable means, such for example as shown in my said patent, after which the seat or seats 38 and oar locks 39 may be placed in position.

When the boat is to be disassembled for storage or transport, the foregoing procedure is substantially reversed. First, the tread member 29 is removed and folded. The fittings 30 are next removed. Thereupon the gunwale stiffeners 14 are removed and folded. The removal of the gunwale stiffeners 14 relaxes the covering 10 so that the rib offsets 22 along one side of the floor boards 28 may be the more easily shifted to disengage one end of the floor boards and permit them to be removed and subsequently folded for storage or transport. After removing the keelsons 27, the bolts 35 are removed from the keel 12, whereupon the groups of keel sections may be shifted to their angular position as shown in Fig. 3, thereby permitting their removal from the stem

and stern posts 17 and 18 and their further disassembling.

With the removal of the stem and stern posts 17 and 18 from the straps 16, the covering 10 may be folded upon itself and rolled into compact form. Many of these folded parts may be tied together, making a small number of bundles for storage or transport.

Variations and modifications in the details of structure and arrangement of the parts may be resorted to within the spirit and coverage of the appended claim.

I claim:

A collapsible boat comprising a flexible fabric covering shaped to form the shell of the boat, a series of transverse ribs attached to said covering and each comprising a flat strip of spring metal, side keelsons seated on said ribs, a floor comprising boards resting on said keelsons and spanning the space between said ribs, certain such ribs at each side of the boat having permanently set V-shaped inwardly offset bends each comprising a downwardly facing shoulder portion positioned to overlie the top of said floor boards

and an upwardly facing inclined cam portion leading to such shoulder portion, said shoulder portions being adapted to hold said floor boards against said keelsons and said cam portions being adapted to cause said ribs to yield to permit said floor boards to be sprung into place below said shoulders when pushed down over said cam portions.

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