April 28, 1953 H. C. MAY 2,636,192

FOLDING BOAT

Filed Nov. 15, 1950

FIG. 1

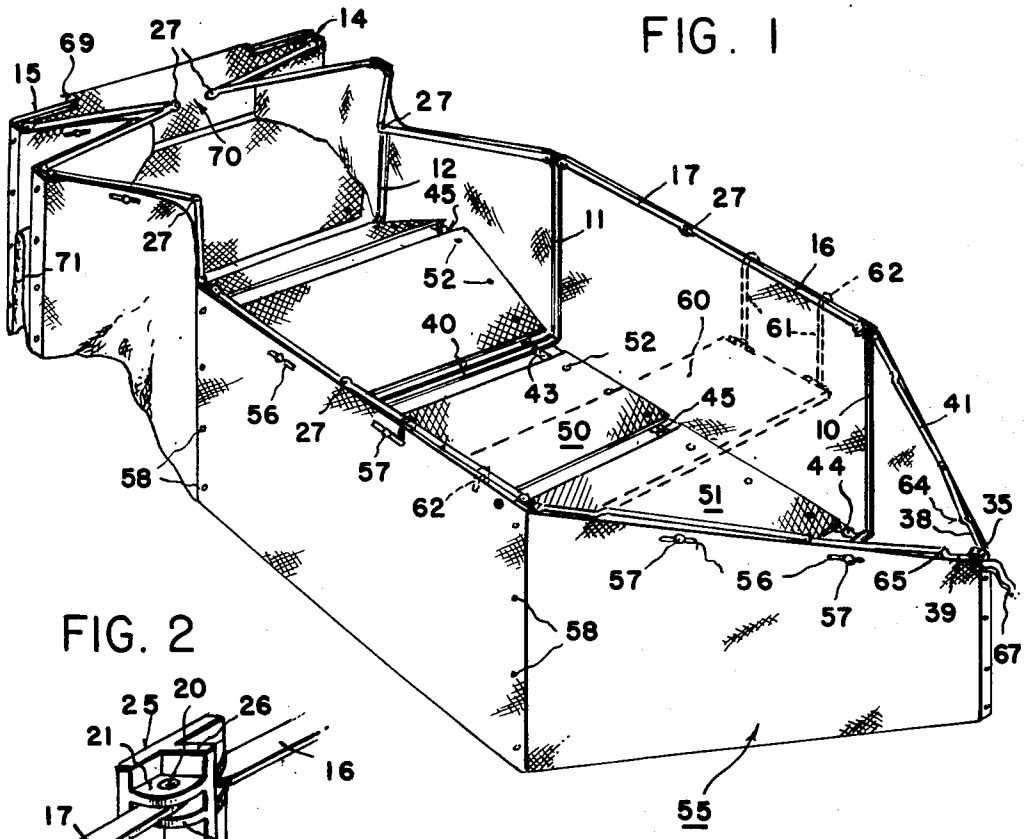


FIG. 2

FIG. 3

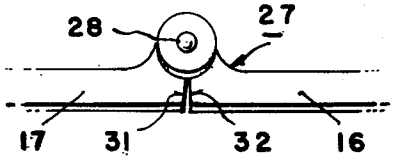
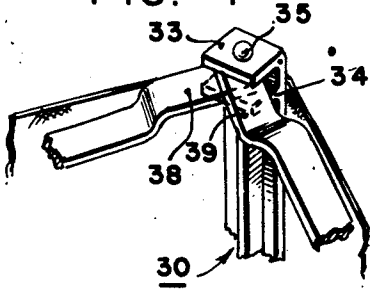


FIG. 4



Inventor
HAYDEN C. MAY,

By Henry H. Snelling
Attorney

Patented Apr. 28, 1953 2,636,192

UNITED STATES PATENT OFFICE

2,636,192

FOLDING BOAT

Hayden C. May, Jackson, Tenn.

Application November 15, 1950, Serial No. 195,799

5 Claims. (Cl. 9—2)

1

This invention relates to boats and has for its principal object the provision of a collapsible or folding boat which may be used as a row boat, a fishing boat, or a hunting boat, with or without an outboard motor, and so designed that it will fold in the nature of an accordion so that it can be packed in a single unit for storing or carrying and which fits easily into the trunk compartment of an ordinary automobile.

A further object of the invention is to provide a frame suitable for use with a folding boat which can be manufactured at a low cost so as to be readily within the financial reach of nature lovers in the lower income brackets.

A further object of the invention is to provide a collapsible boat for use with an outboard motor and having a skin of canvas which decreases the likelihood of snagging and which canvas cover can readily be replaced as the cover is secured to the corrosion resisting frames, preferably of aluminum, in a way to make a solid fit and yet have the skin readily removable whenever there is need for replacement. The skin or canvas cover, however, normally remains fastened to the hinged frame.

Other objects of the invention are set forth in detail in the claims attached hereto.

In the drawings:

Figure 1 is a perspective view of my boat partially folded.

Figure 2 is a perspective view of one of the joints.

Figure 3 shows the central section of a one-way or knee-action hinge linkage.

Figure 4 is a perspective view of the bow post and its associated linkages.

The boat generally is of about the same size and shape as a flat bottom fishing boat. Its width and length can be varied within large degree but it is preferred that the beam or widest point shall be just back of the center and the boat tapers in both directions toward a rectangular frame stern and a pointed bow. I also prefer that the bottom of the boat shall slope upwardly from the fore main transverse rib. The number of ribs will vary with the size of the boat. In Fig. 1 I have shown three transverse, intermediate main ribs 10, 11 and 12 all U-shaped generally and parallel to each other. The generally similar but a bit smaller stern rib 14 is not U-shaped as I prefer to have a stern bar 15 with braces fastened to lower corners and rigidly joining the ends of the stern rib 14. I may use a solid plate joining the bottom and both sides of stern rib with a block of wood or some other

2

suitable means on stern bar 15 to make place to fasten outboard motor.

The several ribs are normally spaced apart by a one-way or knee-action linkage of unequal arms 16 and 17 pivoted to adjoining ribs such as 10 and 11 by pivots 20 driven in lugs 21 and 22 carried by the top end of the ribs as in Fig. 2. The ribs, preferably are of rolled aluminum pieces, generally of T-shape with a head 25 and a stem 26, the latter usually being of materially less thickness than the head. Each linkage has a central offset hinge 27, as best seen in Fig. 3, the pivot being 28 and the contact of the surfaces 31 and 32 being made when the arms 16 and 17 are nearly, but not exactly, alined. These joints are naturally old and well known but are highly suitable in the particular embodiment as these hinges bring the main ribs close together and about parallel to each other but not touching so that they leave ample space between them for the thickness of the skin or canvas cover when boat is folded.

The bow post 30 is preferably of the same rolled non-corrosive aluminum alloy form as the main ribs. The head of the T is turned at right angles so as to be horizontal, as indicated at 33, Fig. 4, and a lug 34 is secured to the post 30 in parallelism and carried between them a short stud 35 which forms the pivot of the front gunwale links 38 and 39. These two links form the short ends of the forward gunwale hinge having a joint similar to that shown in Fig. 3.

When the various hinges 16—17 are all alined they form the gunwale which also includes the forward hinges including the two short links 38 and 39 each of the same length and each pivoted to one of the long arms 41. A similar set of hinges but disposed at an angle of 90° thereto to join the bottom sections 40 of each of the ribs. These hinges consist of members 43 and 44 having a central hinge 45 as in Fig. 3 or any well known knee-action hinge joint. As the hinges 27 move inwardly, as seen at the rear of Fig. 1, the joints 45 of the bottom hinges move upwardly.

Floor pieces 50 and 51 are rigidly secured, as indicated at 52, to the arms such as 43 of the bottom hinges and are secured in the same way to the opposite bottom hinges so that when the boat is expanded the floor sections 50, 51, etc. are all alined except for the forward bottom piece at the fore end of the boat, which obviously slopes upward towards the bow. The skin, denoted generally by the numeral 55, is pre-shaped and made waterproof in any usual manner and

preferably carries elongated grummets 56 in which ride studs 57 with fairly large heads. These studs are secured in any desired manner to the hinges 16, 17, 41, etc. The elongated grummet allows fore and aft movement of the canvas on the frame incidental to the tightening and loosening of the skin when the boat is being folded and unfolded. The stud and grummet could obviously be replaced by the more common belt loops sewed to the canvas and then tied around the frame but the method shown is very much preferred. The skin is secured to the bow post 30 and to each of the ribs by any means desired, either belt loops or any usual type of fastener, my preference being to have ball portions 58 secured to the canvas and fitting in sockets in the heads of the ribs and posts in the general nature of a glove fastener. A more permanent type could readily be used as there is seldom need to remove the skin or cover from the frame work of the boat. One or more seats may be furnished, my preference being for a perfectly plain board 60 having pivoted to it a pair of parallel hangers 61 having hooked ends 62 to fit over the gunwale hinge. When not in use the hooks fold over so that the seat whether of metal or wood can readily be dropped down inside of the folded boat.

In folding the forward or bow portion of the boat I may make the arms 41 equal in length to the arm 16 or I may provide that the bow section shall fold with one of the two short links 33 or 39 folding over the other. In this case I find it convenient to depress or crook the forward hinge as at 64 and to elevate the corresponding link as at 65 so that the pointed front or bow section may be flush with the other folds when the boat is folded for carrying. The advantage of this is that the package will be a bit smaller. As readily can be seen, the package is approximately the same size as the width of the boat at its beam, is as deep as the boat, and its folded length depends on the number of sections. As a typical example: a 12 foot boat having a 3 foot beam and being 18 inches deep will fold into a package roughly 15" x 19" x 37". It is quite convenient to sew an anchor rope of say 1½" wide woven belting 67 to the canvas cover 55 at the extreme bow portion. This anchor rope of belting can then be wrapped around the folded boat and be fastened in a loop at the top greatly facilitating the carrying of the folded boat as well as holding the boat folded.

It is frequently convenient to hang a piece of sheet metal over the stern end of the boat to form an outboard motor mounting and as a protection for the canvas cover. This mounting and protection extends to the bottom bar of the rigid transom type stern frame member and has an inturned lip 69 embracing loosely or securely the stern bar 15.

In folding the boat, as indicated at the upper left hand side of Fig. 1, the two piece linkage is broken by pulling the central portion inwardly so that the central hinges 27 approach each other, as indicated by the numeral 70. At this time the canvas cover slips on the studs 57 and simultaneously the bottom linkages are broken so that the two central sections rise thus forming a fold 71 in the canvas bottom. The skin remains close to the corrugated metal pieces 50 and may or may not be secured to it, preferably not. The seats being removed the successive ribs are brought aft or toward the stern transom rib and finally the stem or bow post is moved rearwardly, the knee-action hinges again folding inward and the post closely approaching the line of the forward main rib 10. The outboard motor mounting plate can obviously remain in place without change and the two seats can either be placed outside of the stern part or be dropped down inside of the folded boat since the hooks readily pivot. If desired, receptacles for oarlocks can be placed at top ends of one or more of the main transverse ribs to hold oarlocks when boat is being rowed, and loops of woven belting or some such material can be sewed at intervals around top of the canvas cover into which the butt ends of brush or small twigs would be placed whenever it is desired to create a blind over or around the boat for use in duck or waterfowl hunting.

What I claim is:

1. A transverse main rib for a folding boat frame comprising a rolled section T-bar bent to general U-shape having a bottom and two parallel sides, the head of the T forming the outside margin of the rib, and a pair of pivot bearing lugs near the top of the rib on each side of the stem of the T, each of the four lugs joining the stem of the T to the head of the T.

2. In combination, a boat frame comprising a plurality of transverse aluminum ribs each having a bottom and two sides, pairs of one-way, off-center, knee-action, hinged linkages pivotally connecting proximate ribs at their tops and at their bottoms near each side, a cover snugly fitting the frame, means for fastening the cover to the sides of the ribs, means slidably mounting the top margin of the cover on the linkages joining the tops of the ribs, and spaced-transverse floor panels connecting opposite bottom linkages between their center joints and their pivotal connection with the transverse ribs, said panels forming with the ribs the linkages, the cover and its fastenings a complete collapsible boat adapted to be packed in a small space by breaking the center joints of the hinged linkages and bringing opposite top center joints into proximity with each other and elevating the center joints of the bottom hinged linkages so as to form an accordion-like package, the cover remaining in contact with the ribs but sliding with respect to the top linkages as the boat is assembled or packed.

3. The combination of claim 2 with a seat having hooks on each side to be secured over the gunwales formed by the series of linkages joining the tops of the ribs.

4. In a folding boat, a vertical bow post, a forward rib having a bottom and two vertical sides, two forward links pivoted to the top of the bow post, two rearward links pivoted respectively to the top of each of the two sides of said rib, each rearward link being pivoted to one of the forward links to form a joint, the two rearward links being of the same length but differing from the length of the two forward links, which are of equal length, said forward links being horizontal at their front pivoted ends so as to slide on each other and each of said forward links having a further portion parallel but spaced from each other by an elevating bend in one link and a depressing bend in another link, whereby in collapsing the boat to folded position, one of the joints connecting a rearward link with a forward link will pass under the other joint without contact and thus permit the four links to be moved to parallelism with a line connecting the tops of the rib.

5. The combination with a folding boat frame

comprising a plurality of transverse ribs having vertical sides connected together at their tops by gunwale hinges, of a canvas cover to form the skin of the folding boat, elongated grummets at the top of the sides of the cover in horizontal alinement, headed studs engaging the grummets and being anchored to said gunwale hinges, and spaced vertical rows of means securing the cover to the sides of the ribs, whereby when the boat is folded the cover will remain fast to the ribs but the headed studs may move laterally in the elongated grummets as the hinges are collapsed.

HAYDEN C. MAY.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,289,906	Presament et al.	Dec. 31, 1918
1,573,958	Whall	Feb. 23, 1926
1,857,236	Cantzler	May 10, 1932
1,863,489	Nowak	June 14, 1932
2,153,282	Dennis	Apr. 4, 1939

FOREIGN PATENTS

Number	Country	Date
360,033	Great Britain	Nov. 2, 1931