March 7, 1944. E. B. McGLONE 2,343,683

LAMINATED BOAT RIB AND METHOD OF MAKING SAME

Filed Sept. 13, 1943

Fig. 1.

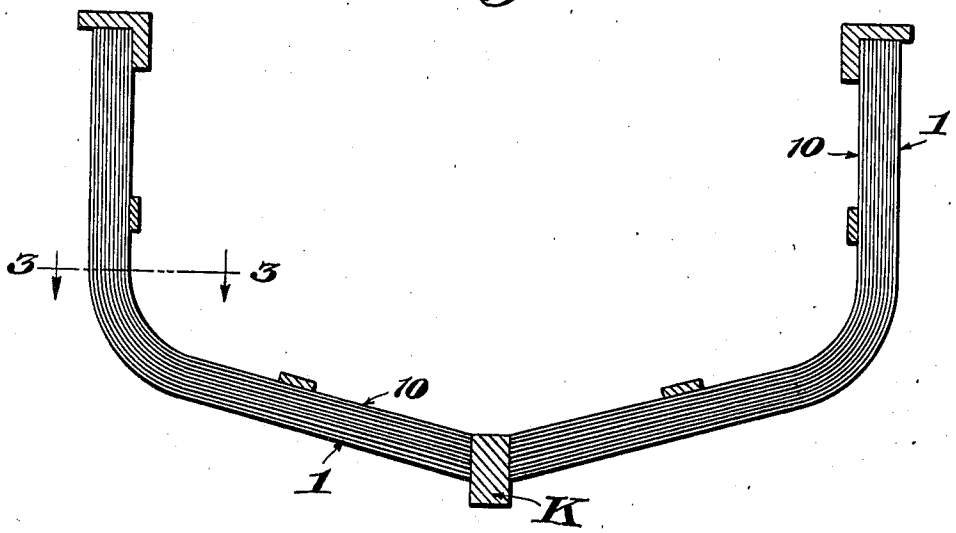


Fig. 2.

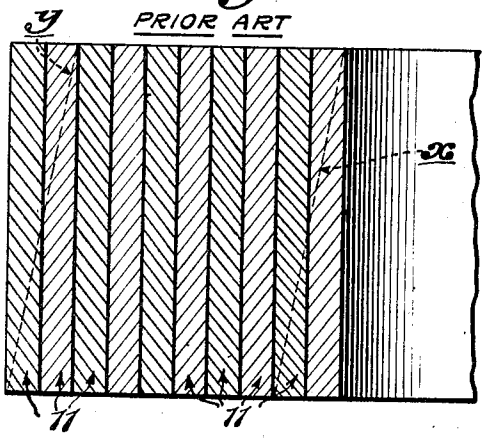
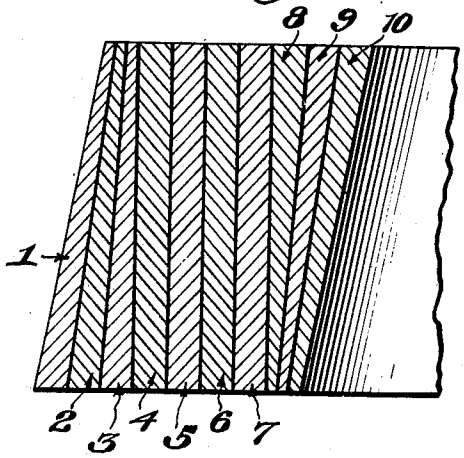


Fig. 3.



Inventor
Edgar B. McGlone
By Henderson & Howell
Attorneys

Patented Mar. 7, 1944 2,343,683

UNITED STATES PATENT OFFICE

2,343,683

LAMINATED BOAT RIB AND METHOD OF MAKING SAME

Edgar Boone McGlone, Pine Bluff, Ark.

Application September 13, 1943, Serial No. 502,214

12 Claims. (Cl. 114—82)

This invention is a novel improvement in boat ribs particularly adapted for use in the manufacture of speed boats, such as submarine chasers, or the like, having wooden ribs requiring great strength to resist the action of heavy seas.

The present invention is an improvement upon the boat rib disclosed in my copending application Serial No. 459,815, filed September 26, 1942, which discloses a laminated boat rib which can be readily manufactured by a cold bending process, utilizing a minimum of apparatus, to conform with the required shapes of templates corresponding with the various hull sections throughout the length of the boat, said laminations being held together by means of waterproof adhesive, and the coated laminations being cold bent and held to the desired curvature by suitable spaced clamps so that when the adhesive dries the ribs will retain their desired shape.

In said copending application Serial No. 459,815, however, the boat ribs were built up of a number of laminations of substantially the same thickness throughout, and in shaping the inner and outer faces of the ribs to conform with the fore-and-aft curvature of the hull of the ship, particularly at the bow and stern, it was necessary to cut diagonally through the laminations by sawing or planing the one, two, or three outermost laminations at both the inner and outer faces of the ribs to such an extent that certain of said laminations would be cut entirely through or across, in order to give a bevel or twist of a half inch or more to the rib; and said cutting through such laminations at the inner and outer faces of the ribs would obviously materially reduce the strength of the rib as a whole.

The object of the present invention is to provide a laminated boat rib of substantially the same type as disclosed in my aforesaid copending application, but so constructed with relation to the laminations adjacent the inner and outer faces of the rib that no lamination is cut entirely through in order to give the desired fore-and-aft bevel to the inner and outer faces of the rib for any particular station, the same being accomplished by planing the said laminations adjacent the inner and outer faces before assembling the laminations into the boat rib, while the more centrally disposed laminations are maintained unaltered as to thickness. Thus when the assembled laminations are formed into a boat rib the same will have the desired shape without necessitating further cutting or planing the rib after the same had been formed; and as above stated since the bevel of the laminations is such that no lamination is entirely cut through, the rib will have maximum strength and rigidity.

I will explain the invention with reference to the accompanying drawing which illustrates one practical embodiment thereof to enable others familiar with the art to adopt and use the same; and will summarize in the claims the novel features of construction and novel combinations of parts, for which protection is desired.

In said drawing:

Fig. 1 is a transverse section through a boat frame utilizing my laminated boat ribs in the construction thereof, the hull planking being omitted from said section.

Fig. 2 is an enlarged section through a laminated boat rib of the prior art showing in dotted lines the necessary bevels or cuts to shape the rib to conform with the fore-and-aft curvature of the boat hull.

Fig. 3 is a section on the line 3—3, Fig. 1, showing a section through my novel boat rib in which certain of the laminations are tapered prior to assembly to give the finished rib the desired bevel conforming with the fore-and-aft curvature of the hull.

As shown, my novel laminated boat rib A is formed of a series of laminae, ten being shown, numbered 1 to 10 in Fig. 3; but obviously a greater or less number can be used, each lamination preferably comprising a strip of flat grain white oak approximately two to six inches in width and of relatively small thickness, approximately 3/8 inch, so that it may be readily cold bent to desired curvature without unduly stressing the fibres thereof, the laminations being secured together by waterproof cement or adhesive, preferably comprising a phenol resin but which may be of any other desired material.

As disclosed in my copending application Serial No. 459,815 aforesaid, in forming the boat rib according to the usual practice, the contacting faces of the laminations 1 to 10 are covered with cement, glue or adhesive, and all the laminations are placed on a forming or bending table and cold bent while the cement, glue or adhesive is still wet, to conform with the shape of a previously formed template for a particular station of the boat hull, said rib being held to the template curvature by means of adjustable clamps spaced approximately 18 inches apart through its length so as to be fixed in a position conforming with the shape of the template, the adjustable clamps being readily adjustable to take care of any desired curvature or shape of the assembled laminations throughout its entire length.

The bending of the laminations, while cold, does not effect in any way the action of the waterproofing cement, glue or adhesive, in securely holding the laminations together; and cold bending obviates the necessity of having to steam and bend a solid rib having substantially the same cross-sectional area as the laminated rib. By cold bending the laminations, no steaming is required and the fibres in the individual laminations are not so stretched as to become broken or impaired; and the untreated wood will react properly with the adhesive or cement.

After the laminations have been formed to proper curvature and shape on the forming or bending table, and while the cement, glue or adhesive is still wet, all the laminations are then securely held together by fixed clamps spaced approximately nine inches apart throughout the length of the rib, said fixed clamps thus binding all the coated laminations together until the cement, glue or adhesive dries, each lamination being cold bent so as not to effect the action of the cement, glue or adhesive in binding the laminations together.

As soon as the fixed clamps have been applied the adjustable or forming clamps may be removed and the fixed clamps will hold the rib in shape until the cement, glue or adhesive sets, after which the rib will retain its shape indefinitely and will not be effected by moisture, water, or atmospheric conditions.

Fig. 2 shows a section through a laminated rib of the prior art in which the laminations are of uniform thickness and built up to the desired thickness of the rib. In Fig. 2 ten laminations 11 are shown of uniform thickness. In order to shape the inner and outer faces of the rib of Fig. 2 to conform with the fore-and-aft or horizontal curvature of the boat hull, it has heretofore been necessary after the boat rib has been formed to the shape of the particular hull section, to bevel or plane or cut same along lines such as *x—y*, Fig. 2, so that the outer face of the rib will fit squarely against the side of the planking and the inner face will be parallel with the outer face, while the fore-and-aft faces of the rib remain normal to the keel K, Fig. 1.

As indicated in Fig. 2, for sections adjacent the hull and stern of the boat, such lines *x—y*, Fig. 2, would necessarily have to cut entirely across the outer and inner laminations 11, thereby weakening the frame as a whole, the lines of sections cutting across the abutting faces of certain adjacent laminae 11.

According to my present invention I secure the same shape section by beveling the one, two or three outer and innermost plies 1, 2, 3, and 8, 9, 10 (Fig. 3) to give the desired angularity to the outer face of lamination 1 and to the outer face of lamination 10, the beveling being effected by cutting or planing before the laminations 1—10 are built up into a rib.

In mass production of boats of this type, a large number of duplicate ribs would necessarily have to be built for different boats, and according to my invention a template would be first made for each of the outer laminae such as 1, 2, 3 and the inner laminae such as 8, 9, 10, and these laminations would be beveled or planed to conform with their respective templates prior to coating with adhesive and cold bending to form the rib. Thus when the laminations are assembled to form the rib the desired curvature or bevel of the outer and inner faces of the rib defined by the lines *x—y* (Fig. 2) will be formed directly therein without necessitating further planing, and it will be noted that none of the laminations are cut entirely through as in the prior art rib, Fig. 2. Thus my boat rib is decidedly stronger and does not have the inherent defect of the prior art rib, Fig. 2. By making the bevel of the inner laminations 8, 9 and 10 opposite but equal to the bevel of the laminations 1, 2 and 3, a uniform thickness of the rib is maintained so that the width of the rib at the fore-and-aft faces will be equal, thus enhancing the appearance of the rib when assembled in the boat.

In Fig. 3, it will be noted that the inner laminations 4, 5, 6 and 7 have been untouched and are of uniform width, the same as in the prior art section, Fig. 2. By forming templates for the outer laminations 1, 2, 3 and 8, 9, 10 for each of the sections of the hull, a large number of laminae may be readily formed for the same corresponding station, and as above stated, when the preformed laminations 1 to 3, 8 to 9 are assembled with inner laminations 4, 5, 6 and 7 to form the boat rib the desired curvature will be inherent in the laminated rib when it comes from the forming table and drier, thus obviating the necessity of having to further plane or shape the outer and inner faces of the rib.

My novel laminated boat rib possesses increased strength over that of a solid boat rib having the same cross-sectional area and which has been steamed and bent to shape.

I do not limit my invention to the exact form shown in the drawing, for obviously changes may be made therein within the scope of the claims.

I claim:

1. A laminated boat rib, comprising a plurality of wooden laminae conforming with the curvature of a section of a boat hull and secured together by waterproof cement; some of the laminations having a preformed bevel to cause the outer face of the assembled rib to conform directly with the fore-and-aft curvature of the hull at said section.

2. A laminated boat rib, comprising a plurality of wooden laminae conforming with the curvature of a half-section of a boat hull and secured together by waterproof cement; the outer group of laminations having preformed bevels to additively impart directly to the outer face of the rib a bevel conforming with the fore-and-aft curvature of the hull at said section.

3. A laminated boat rib, comprising a plurality of wooden laminae conforming with the curvature of a half-section of a boat hull and secured together by waterproof cement; the exterior groups of laminations at both the outer and inner faces of the ribs having preformed bevels to additively impart directly to the inner and outer faces of the rib a bevel conforming with the fore-and-aft curvature of the hull at said section.

4. In a rib as set forth in claim 3, the bevels of the respective exterior groups of laminations at the inner and outer faces of the rib being equal and opposite, whereby the inner and outer faces of the rib will be parallel.

5. A laminated boat rib, comprising a plurality of wooden laminae conforming with the curvature of a half-section of a boat hull and secured together by waterproof cement; the exterior groups of laminations at both the outer and inner faces of the rib having preformed bevels to additively impart directly to the inner

and outer faces of the rib a bevel conforming with the fore-and-aft curvature of the hull at said section; and the central group of laminations being of uniform thickness.

6. In a rib as set forth in claim 5, the bevels of the respective exterior groups of laminations at the inner and outer faces of the rib being equal and opposite, whereby the inner and outer faces of the rib will be parallel.

7. The method of making laminated half-section boat ribs comprising the steps of combining laminations having preformed bevels which additively impart to the outer face of the rib a bevel conforming with the fore-and-aft curvature of a hull at a desired half-section; applying cement to the contacting faces of the laminations; cold bending the combined laminations to conform with the vertical curvature of the said half-section; and maintaining said laminations to said curvature until the cement dries.

8. The method of making laminated half-section boat ribs comprising the steps of combining a group of laminations of equal thickness with another group having preformed bevels which additively impart to the outer face of the rib a cover conforming with the fore-and-aft curvature of a hull at a desired half-section; applying cement to the contacting faces of the laminations; cold bending the combined laminations to conform with the vertical curvature of the said half-section; and maintaining said laminations to said curvature until the cement dries.

9. The method of making laminated half-section boat ribs comprising the steps of combining an inner group of laminations of equal thickness with outer groups having preformed bevels which additively impart to the inner and outer faces of the rib a bevel conforming with the fore-and-aft curvature of a hull at a desired half-section; applying cement to the contacting faces of the laminations; cold bending the combined laminations to conform with the vertical curvature of the said half-section; and maintaining said laminations to said curvature until the cement dries.

10. In a method as set forth in claim 9, the bevelling of the respective outer groups of laminations being equal and opposite, whereby the inner and outer faces of the ribs will be parallel.

11. The method of making laminated half-section boat ribs comprising the steps of combining groups of preformed beveled laminations which additively impart to the inner and outer faces of the rib a bevel conforming with the fore-and-aft curvature of a hull at a desired half-section; applying cement to the contacting faces of the laminations; cold bending the combined laminations to conform with the vertical curvature of the said half-section; and maintaining said laminations to said curvature until the cement dries.

12. In a method as set forth in claim 11, the bevelling of the respective groups of laminations being equal and opposite, whereby the inner and outer faces of the ribs will be parallel.

EDGAR BOONE McGLONE.