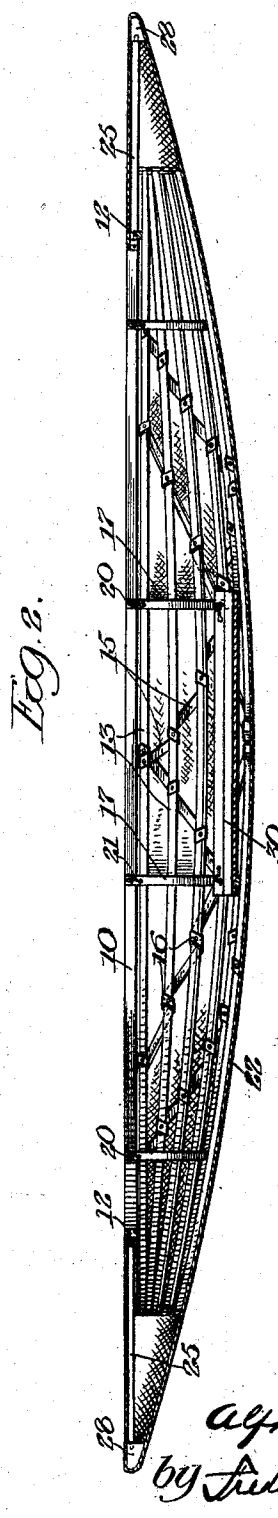
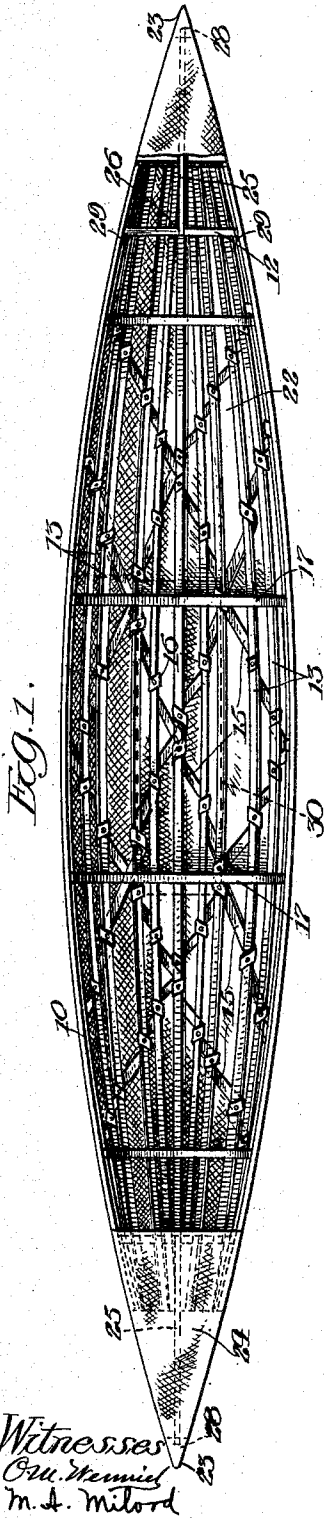


A. A. HENRIKSON.
FOLDING CANOE.
APPLICATION FILED MAY 4, 1910.

981,191.

Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

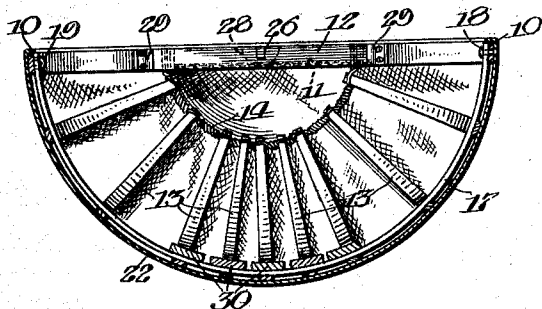


Fig. 4.

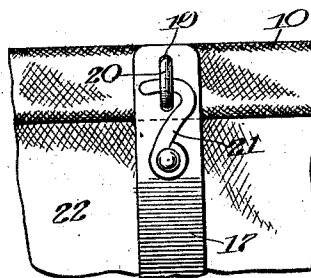


Fig. 5.

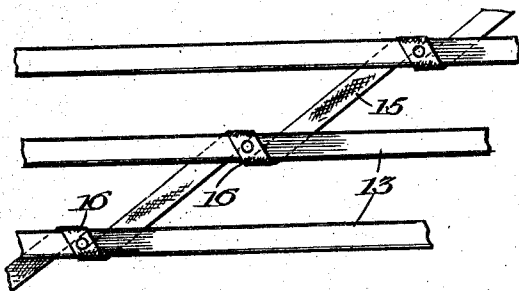


Fig. 7.

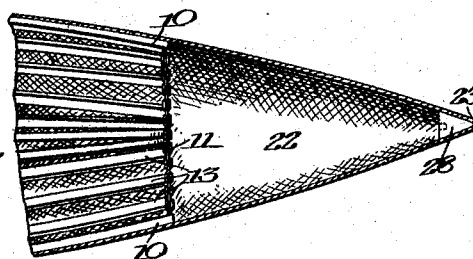
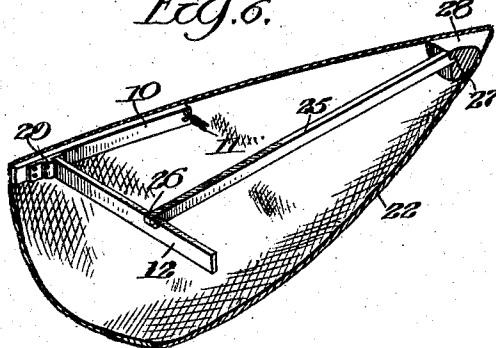


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALFRED ALRIC HENRIKSON, OF CHICAGO, ILLINOIS.

FOLDING CANOE.

981,191.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed May 4, 1910. Serial No. 559,259.

To all whom it may concern:

Be it known that I, ALFRED ALRIC HENRIKSON, a subject of the Czar of Russia, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Folding Canoes, of which the following is a specification.

My invention relates to boats of the collapsible type and refers particularly to that class of boats known as canoes.

The chief objects of the improvements which constitute the subject matter of this application for patent are:—to provide a canoe so constructed that it may be readily and easily folded into a small compass for transportation; to furnish a canoe of the folding type that will be light in weight, strong as to construction and made of durable material well adapted to withstand the usage to which such boats are subject.

Referring to the constructive details, I have kept in view the necessity of providing means for securely retaining the foldable or collapsible members in their extended or operative position, and to furnish struts and braces to support the framework that will be efficient, easily assembled and as readily dismantled.

An important object of the invention is to produce a practical folding canoe that can be cheaply manufactured and placed on the market at a minimum cost.

I accomplish the desired results by means of the apparatus illustrated in the accompanying drawings, which form a part of this application, the details of construction being disclosed in the following views:—

Figure 1 is a top plan view of my improved foldable canoe in extended, or operative position; Fig. 2 is a longitudinal median section; Fig. 3 is a transverse section on an enlarged scale, the section being taken on a line about midway of the ends; Fig. 4 is a detail, also enlarged, showing the manner of securing the flexible spreaders; Fig. 5 is a fragmentary view showing the manner of connecting the ribs together to insure their proper spacing; Fig. 6 is a fragmentary sectional view of one end of the canoe, showing the stiffening brace, and Fig. 7 is a top plan view of a canoe end with the covering and stiffening braces removed.

Referring to the details of the construction as disclosed in the drawings, the gunwales of the canoe are formed by two flat

flexible strips 10, connected at the ends by a chain 11, and kept apart near their ends by spacing members, consisting of flat bars 12, having their ends engaging the inner faces 30 of the said strips. Arranged between the gunwale strips are a series of longitudinal ribs 13, of approximately the same length as the strips 10. These ribs, which are slightly tapering from the middle toward 65 each end also the gunwale, are preferably made of a suitable variety of wood, such as spruce, which possesses the requisite qualities of resiliency, strength and lightness.

The ribs and gunwale strips are fastened 70 together at the ends by a flexible cable 14, which has sufficient rigidity to hold the extremities of the connected members slightly spaced apart when in operative relation, as shown best in Fig. 3. In the plan view, Fig. 75 1, the strips 10 are shown curved, and the ribs are also slightly bent to correspond with the general outline of the gunwale. In reality both strips and ribs are substantially straight when dismantled and are made to 80 assume the curved form shown, which is desirable in craft of this nature, by means of devices hereinafter described and termed spreaders. The said ribs are connected to each other and to the gunwale by a plurality 85 of flexible straps or tapes 15, running diagonally from side to side of the canoe and fastened to the ribs by a single turn of the tape secured by nails or tacks 16. The purpose of this flexible connection is to limit the distance 90 apart of the ribs when assembled, and yet permit them to be approximated so as to lie closely in apposition when the tensioning or spreading devices are removed. The skeleton frame formed by the gunwale strips 95 10 and ribs 13 is caused to assume the outline suited to a craft of this type by means of spreaders 17. There are four of these spreaders arranged at suitable intervals, the middle spreaders placed more nearly amid- 100 ship, being necessarily longer than the others to give the needed greater breadth of beam at this part. Each spreader consists of a straight flat bar of spring steel of required strength and stiffness, but having sufficient flexibility 105 to permit it to be bent in semicircular form, as shown in Fig. 3, where one of these spreaders is shown extending between the opposite sides of the gunwale, and resting upon the upper faces of the longitudinal 110 ribs of the framework. While these spreaders may be entirely separate pieces adapted

to have their ends engaging the opposite strips 10, I prefer to attach them in the following manner:—One end of each spreader is pivoted to one of the gunwale sides by a
 5 rivet 18 (Fig. 3) while the opposite end is furnished with a longitudinal slot 19, adapted to receive an eye or staple 20 attached to the gunwale opposite the corresponding rivet, which is engaged by a hook latch 21, pivoted
 10 on the spreader, adjacent the said slot.

The frame thus constructed is covered by the usual shell or skin 22. I prefer to use for this purpose a strong canvas covering of suitable weight and rendered impervious to
 15 water by the application of paint or other substance having the requisite water proofing qualities. The material for the cover is cut goring shaped to give it the required form corresponding with the shape of the
 20 distended frame so as to produce the proper lines for the shell, and is somewhat longer than the frame, the gores being sharply contracted near their ends so that they will meet in points 23, near each extremity of the
 25 vessel. Between these points and the struts or spacing bars 12 the canvas is extended across the top of the canoe as indicated at 24 so that this portion is entirely housed in by said covering, the remaining portion of
 30 the craft remaining open above as is usual in vessels of this class. The canvas is secured to the frame by nailing it to the upper margin of the gunwale strips, by suitable nails or tacks (not shown) and the flexible portions
 35 forming the ends of the boat are held firmly distended at each end by a stiffening brace or strut 25, arranged in the median line. One end of this brace is let into a notch 26 in the upper edge of the corresponding spacing
 40 bar 12, and is itself notched to form a shoulder which abuts against the face of said bar 12. The opposite end of the brace is formed with a tenon 27 to engage a mortise in a block 28 which is inserted in the
 45 extreme end of the housing at each end of the canoe. This brace is sprung into place so as to exert a strong endwise thrust against the block to hold the shell distended, the gunwale at either side being furnished with
 50 a strong lug or shoulder 29 forming a stop for the spacing bar. The usual bottom boards 30 are placed amidships and removably secured to the frame ribs in any desirable manner. A marked advantage of
 55 this improved construction lies in the unusual facility with which the frame may be assembled or dismantled, the light weight of the entire structure rendering it conveniently portable as previously stated and when in
 60 a collapsed state the entire craft will occupy a comparatively small space admirably adapted for transportation or storage.

When in a collapsed condition the flexible connections between the ribs and gunwale
 65 will permit the ribs and strips to be brought

closely together and the covering will fall into loose folds which may be wrapped around the framework to form a compact bundle of comparatively small diameter. The brace 24 and spacing bar 12 at each end
 70 having been removed and placed in the interspaces of the bundle the extended ends of the flexible canvas skin are then folded back upon the bundle, and secured by cords or placed within a protecting bag (not shown). 75

The manner of extending the frame is as follows:—The gunwale members are first separated sufficiently to permit the spreading bars 12 to be sprung into place where they are held by the resiliency of the strips
 80 the spread of which is limited at the ends by the chain 11. The struts or braces are then put in position, distending the canoe ends. When in the collapsed position the spreaders are turned upon their pivots to lie flat
 85 along the gunwale, and to bring them to their operative position the operator, taking one at a time will bend it into a semicircle, and, swinging it around upon its pivot to a position transverse to the boat, he will cause
 90 the corresponding eye 20 to engage the slot 19 in the free end of the spreader and secure it in position by the hook 21. The assembling of the device is completed by placing the bottom boards 29 in position. To fold or
 95 collapse the canoe it is only necessary to reverse the steps above set forth.

Having thus described my invention, what I claim as new, is:—

1. In a foldable canoe, the combination
 100 of a collapsible frame comprising gunwales formed of resilient strips, a series of longitudinal ribs arranged between said strips, flexible connections between said ribs and gunwale, rigid spacing bars removably engaging
 105 the opposite gunwales, resilient spreaders comprising strips detachably connected with one gunwale, and a flexible covering for the said frame.

2. In a foldable canoe, the combination of
 110 a collapsible frame comprising gunwales formed of two resilient members, a series of longitudinal resilient ribs flexibly connected, rigid spacing bars removably engaging the opposite gunwales, resilient spreaders extending between the opposite gunwales and bent in curved form to bear upon the said ribs, a flexible covering for the frame projecting beyond the frame ends, and rigid
 115 braces adapted to stiffen the projecting portions of the covering. 120

3. In a foldable canoe, a collapsible frame comprising a pair of longitudinal strips forming the gunwales, flexible connections for the ends of the strips, removable rigid
 125 spacing bars between the strips, a series of longitudinal ribs flexibly connected, resilient spreaders detachably connected to said longitudinal strips, and a flexible covering for the frame. 130

4. In a foldable canoe, a collapsible frame comprising a pair of longitudinal strips forming the gunwales, flexible connections between said strips, removable rigid spacing
5 bars extending between the strips, flexibly connected longitudinal ribs, removable resilient spreaders extending transversely between said strips, a flexible covering extending beyond the frame ends and removable
10 means for stiffening the extended portions of the covering.

5. In a foldable canoe, a collapsible frame comprising a pair of longitudinal resilient strips forming gunwales, rigid spacing bars
15 removably arranged between the strips, longitudinal ribs, spreaders extending between said strips and bent into curved form to bear upon said ribs, a flexible covering projecting beyond the frame ends, and stiff-

ening braces adapted to extend the projecting portions of the covering. 20

6. In a foldable canoe, a collapsible frame comprising gunwale members, flexible connections between the ends of the members, flexibly connected ribs arranged longitudi- 25
nally of said frame, flexible means for holding said ribs in proper relative position, and resilient spreaders having their ends engaging the said gunwale members, and adapted to distend the said frame and covering. 30

In testimony whereof I affix my signature in the presence of two witnesses.

ALFRED ALRIC HENRIKSON.

Witnesses:

CHAS. F. BASSETT,
C. B. BENJAMIN.