No. 842,908. PATENTED FEB. 5, 1907.

I. O. PERRING.

FOLDABLE OR COLLAPSIBLE BOAT.

APPLICATION FILED FEB. 13, 1905. RENEWED OCT. 3, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

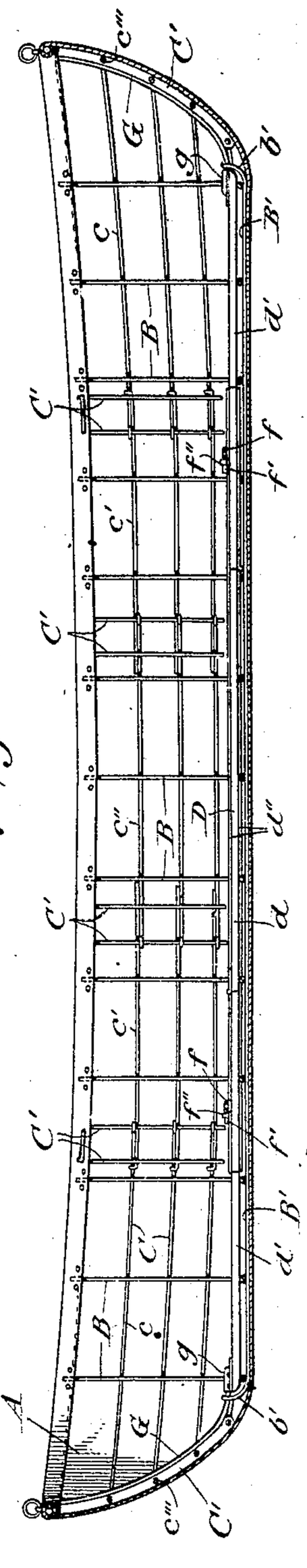

Fig. 2.

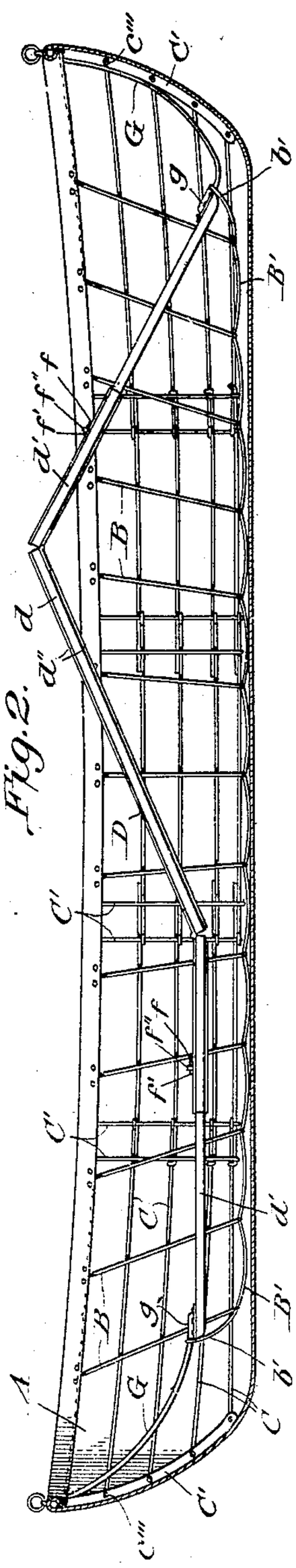

Fig. 7.

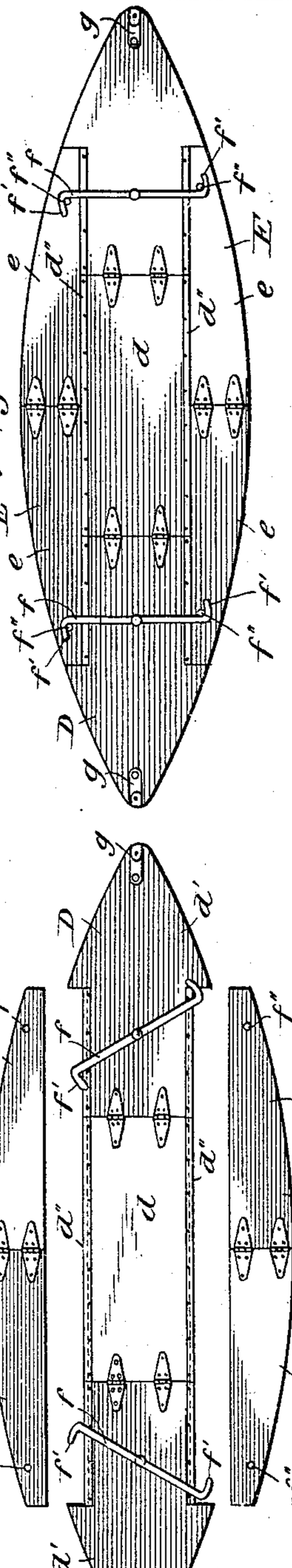

Fig. 6.

Witnesses:
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Ethel A. Bradford

Inventor;
Ira O. Perring
By Chappell & Earl, Attys

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2 SHEETS—SHEET 2.

Fig. 3.

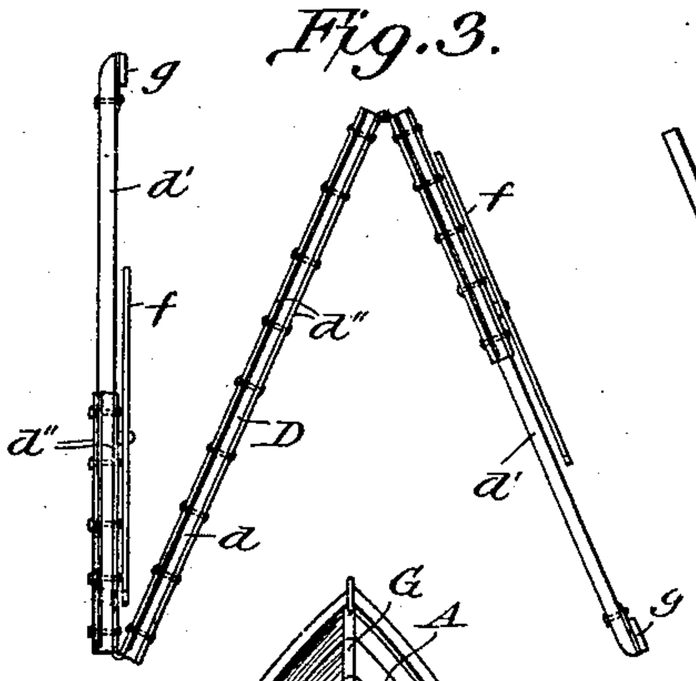


Fig. 4.

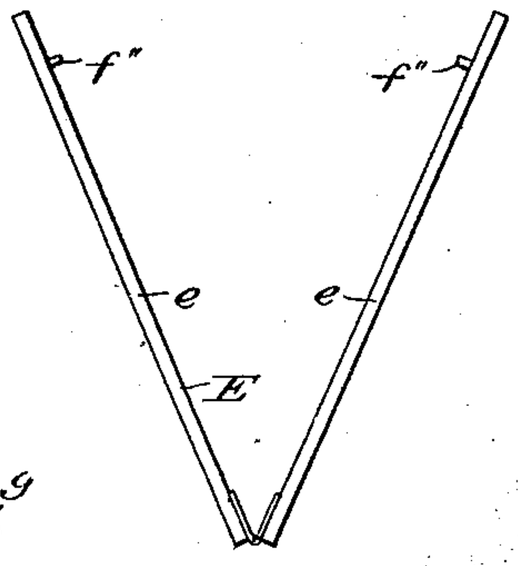


Fig. 5.

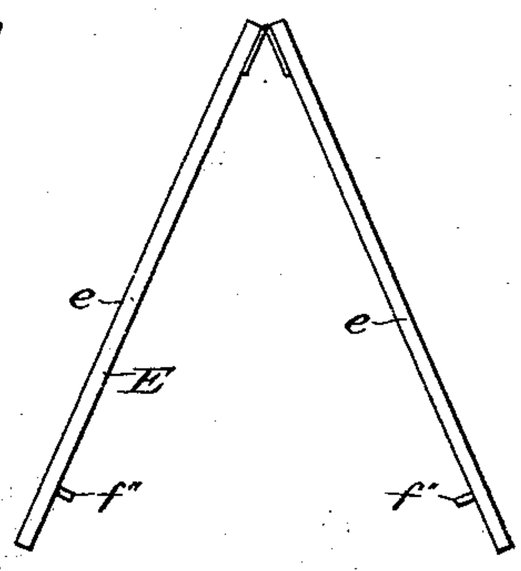


Fig. 8.

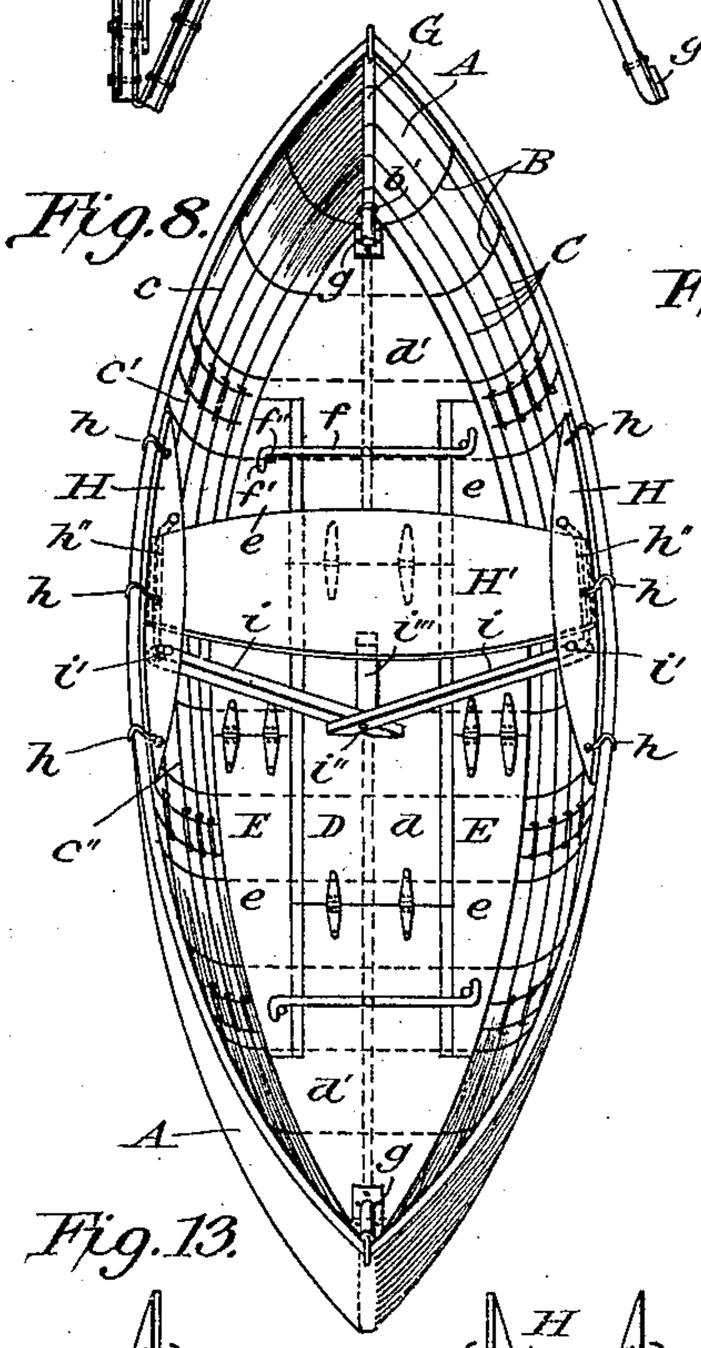


Fig. 13.

Fig. 9.

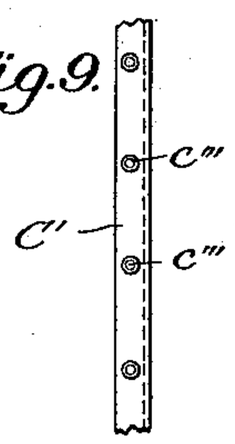


Fig. 10.

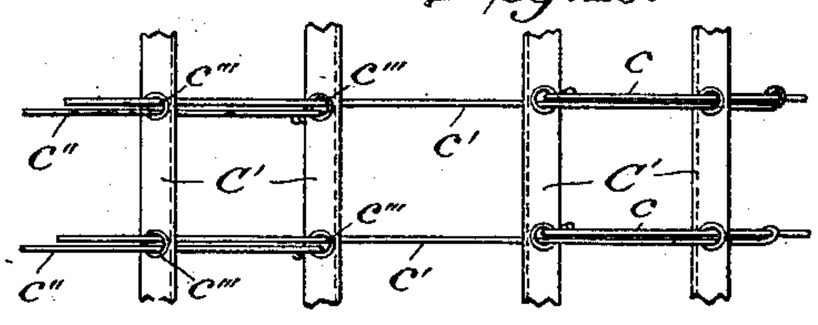


Fig. 14.

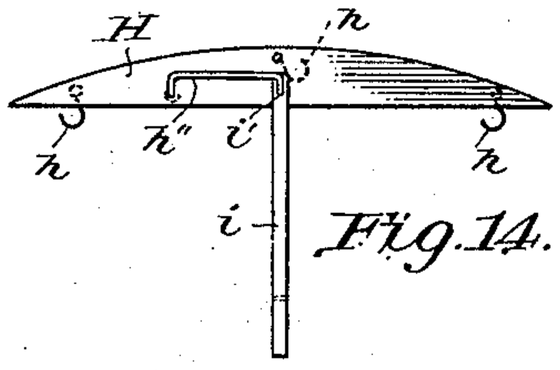


Fig. 15.

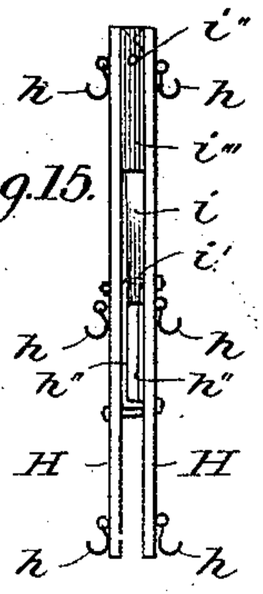


Fig. 12.

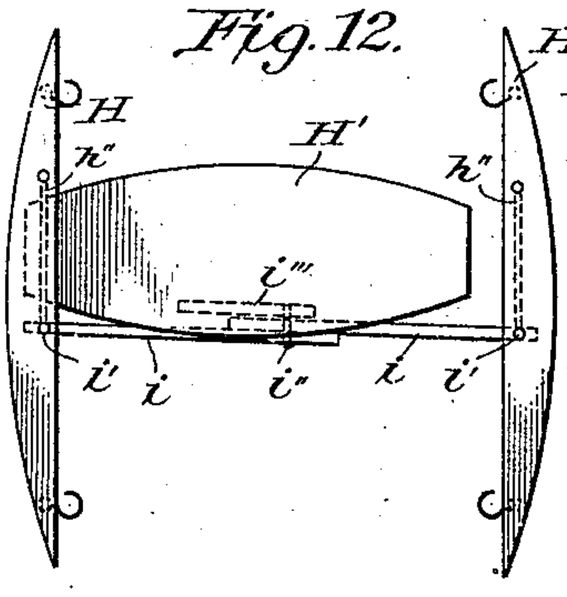
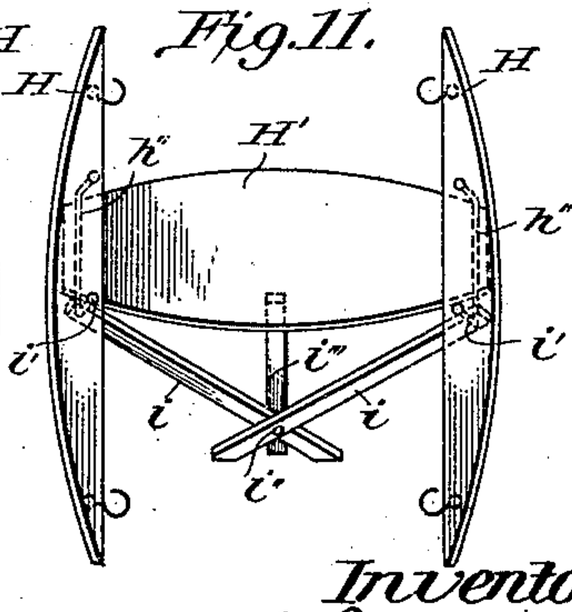


Fig. 11.



Witnesses:

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Ethel A. Bradford

Inventor;
Ira O. Perring
By Chappell & Earl
Attys.

UNITED STATES PATENT OFFICE.

IRA O. PERRING, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO LIFE-SAVING FOLDING CANVAS BOAT COMPANY, OF KALAMAZOO, MICHIGAN, A CORPORATION.

FOLDABLE OR COLLAPSIBLE BOAT.

No. 842,908. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed February 13, 1905. Renewed October 3, 1906. Serial No. 337,274.

To all whom it may concern:

Be it known that I, IRA O. PERRING, a citizen of the United States, residing at the city of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented certain new and useful Improvements in Folding or Collapsible Boats, of which the following is a specification.

This invention relates to improvements in folding or collapsible boats.

The objects of this invention are, first, to provide an improved folding or collapsible boat which is strong and durable and at the same time light in weight; second, to provide an improved folding or collapsible boat which may be quickly set up or knocked down, and one which when knocked down may be made into a very compact package for transportation or storage; third, to provide in a folding or collapsible boat an improved combination keel and bottom which although comparatively light in weight is very rigid when set up and may be folded into a compact package when knocked down; fourth, to provide in a folding or collapsible boat an improved means for supporting and securing the ribs in position.

Further objects and objects relating to structural details will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means pointed out in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure embodying the features of my invention is clearly illustrated in the accompanying drawings, forming a part of the specification, in which—

Figure 1 is a central longitudinal sectional view of my improved folding or collapsible boat, the combination keel and bottom being shown in full lines with one of its side pieces E removed. Fig. 2 is a longitudinal sectional view of my improved folding or collapsible boat, the central portion D of the combination bottom and keel shown in full lines in the position in which it is placed in inserting. Fig. 3 is a side elevation view of the central portion D of my improved combination keel and bottom, showing structural details. Figs. 4 and 5 are side elevation views of the side pieces E of my improved combination keel and bottom, showing structural details thereof. Fig. 6 is a plan view of my improved combination keel and bottom in its disassembled condition, the bow and the stern keel extensions G being omitted. Fig. 7 is a plan view of my improved combination keel and bottom in its assembled condition with the keel extensions G omitted. Fig. 8 is a perspective view of my improved folding or collapsible boat looking from one end. Fig. 9 is a detail plan view of one of the supporting-straps C′ for the longitudinal ribs C of the boat. Fig. 10 is a detail plan view showing the relation of the supporting-straps and the longitudinal ribs of the boat. Fig. 11 is a perspective view of the seat of my folding or collapsible boat removed therefrom. Fig. 12 is a perspective view of the seat-board and its support, showing the manner of securing the seat-board. Fig. 13 is a perspective view showing the seat-board support in its initial position in setting up. Fig. 14 is a plan view of one of the seat-supporting pieces H. Fig. 15 is a side elevation view of the seat-board supports H folded.

In the drawings, similar letters of reference refer to similar parts throughout the several views.

Referring to the drawings, the skin or outer covering A of my improved collapsible boat is preferably made of canvas suitably treated to render the same waterproof.

I provide cross-ribs B and longitudinal ribs C. These ribs are preferably made of wire. The ends of the cross-ribs are arranged in suitable sockets in the gunwale, the details of which are not here illustrated. The cross-ribs B are secured together by a strap B′. The strap B′ is secured to the ribs at a central point, so that it lies under the keel when the boat is assembled. The main advantage of this strap is that it properly spaces the ribs in assembling, and, further, keeps them all together when the boat is disassembled.

The longitudinal ribs C are made up of sections *c c′ c″*, the sections *c* being the end sections, *c″* the central sections, and *c′* the intermediate sections. The end sections *c* are preferably hair-pin-like in form—that is, connected in pairs. The intermediate sections *c′* are adapted to be telescoped onto the

end sections *c* when the boat is collapsed, which permits the folding of the skin. The longitudinal rib-sections are supported and their overlapped ends secured together by straps C′, which are suspended from the gunwale of the boat. These straps C′ are arranged in pairs and are provided with suitable grommets *c‴* to receive the ends of the rib-sections. (See Figs. 9 and 10.) To further secure the sections *c′* in place, their outer ends are looped about the rib-sections *c*, as clearly appears in Fig. 10. When thus arranged, if it is desired to collapse the boat the rib-sections *c′* are telescoped upon the sections *c*. When the ribs are thus telescoped, it is evident that the skin may be folded longitudinally and rolled into a bundle without removing the longitudinal ribs. The gunwale is also made up of telescoping sections, which are embraced in a fold or pocket in the upper edge of the skin A.

The combination keel and bottom is made up of a central portion D and side portions E. The central portion D of the keel is made up of three sections *d d′ d′*. These sections *d d′ d′* are secured together by hinges. The hinges of one end of the sections *d′* to the central section *d* are located on the under side, and the hinges of the other section *d′* to the central piece *d* are located on the top side. This enables the folding of the end sections upon the central section, the end sections lying flat thereon.

The edges of the central portion D of the keel are provided with projecting strips or cleats *d″*, which form grooves adapted to receive the side pieces E. These strips *d″* are preferably pieces of band-iron and are arranged so as not to interfere with the hinges.

The side pieces E are each made up of two sections *e*, hinged together at a central point, so that the sections may be folded upon each other. The sections of these side pieces overlap the joints of the sections of the central portion of the keel, and the central section *d* of the central portion of the bottom overlaps the joints of the side sections, so that when the side pieces are in position a rigid structure is secured.

The side pieces E are secured in the grooves by pivoted rods *f*, which have oppositely-disposed hooks *f′* at their ends adapted to engage the screws or pins *f″* in the side pieces.

Thus arranged, my combination bottom and keel can be very readily set up or knocked down, and when in the knockdown can be folded into a very compact package. At the same time, when set up it is very rigid, although it may be made of comparatively light material.

The central portion D of the keel is provided with sockets *g* at each end adapted to receive the bow and stem keel extensions G. By thus arranging the parts the skin may be stretched longitudinally by means of the keel. (See Figs. 1 and 2.)

In assembling the boat the longitudinal ribs are first arranged in the skin and the cross-ribs are then arranged with their ends engaged in the sockets in the gunwale. The ends of the strap B are secured upon the keel extensions G and the central portion D of the keel placed in the boat, as is illustrated in Fig. 2, with the keel extensions G engaging the sockets *g* thereof. By forcing the keel into the bottom of the boat the cross-ribs are drawn into their proper position by means of the strap B′, and the skin is stretched longitudinally and also transversely by the straightening up of the cross-ribs. The side pieces E of the combination keel and bottom are then inserted and secured in position. This locks the parts together.

The hooks *h* of the seat-supports H are engaged over the gunwale of the boat, the initial position of the parts in doing this being illustrated in Fig. 13. These seat-supports are connected by braces *i*, which are pivotally secured thereto at *i′* and to each other at *i″*. The pivots *i′* are arranged transversely through the supports H, and the pivots *i″* are arranged in a transverse relation to the pivots *i*, so that the braces may be folded upon each other and then folded upon the supports, as is illustrated in Fig. 15.

On the under side of the supports H are loops *h″*, adapted to receive the ends of the seat-board H′. As the braces *i* are forced downwardly in placing the supports in position the seat-board is inserted in the loops, and when the braces *i* are in their lower position the seat-board is clamped by these loops. (See Fig. 11.)

Secured to the braces *i* by the pivot *i″* is a standard *i‴*, which after the braces are forced down into contact with the bottom is turned up to serve as a central support for the seat-board. (See Fig. 11.)

By thus arranging the parts they may be of comparatively light material and at the same time possess sufficient strength for all purposes. The structure is also capable of being folded very compactly when the boat is in the knockdown.

I have illustrated and described my improved collapsible or folding boat in detail in the form preferred by me on account of its structural simplicity, durability, and convenience. I am aware, however, that the same may be varied very considerably in structural details without departing from my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; longitudinal ribs made up of overlapping sections adapted to telescope upon each other,

the sliding section having eyes therein to receive the sections upon which they are telescoped; supporting-straps arranged in pairs adapted to receive the overlapping ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; upwardly-projecting pins on said side pieces; rods having oppositely-disposed hooks at their ends adapted to engage the said pins, pivoted to the said central portion; sockets in the ends of said central portion; keel extensions adapted to be arranged in said sockets, arranged through the ends of the said cross-rib-connecting strap; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

2. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps arranged in pairs adapted to receive the overlapping ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in the said grooves so that the sections thereof overlap the joints of the said central portion; sockets in the ends of the said central portion; keel extensions adapted to be arranged in said sockets, arranged through the ends of the said cross-rib-connecting strap; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

3. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps arranged in pairs adapted to receive the overlapping ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; upwardly-projecting pins on said side pieces; rods having oppositely-disposed hooks at their ends adapted to engage the said pins, pivoted to the said central portion; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

4. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps arranged in pairs adapted to receive the overlapping ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in the said grooves so that the sections thereof overlap the joints of the said central portion; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-support and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be

turned up to engage the under side of said seat-board, for the purpose specified.

5. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; suitable ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; upwardly-projecting pins on said side pieces; rods having oppositely-disposed hooks at their ends adapted to engage the said pins, pivoted to the said central portion; sockets in the ends of said central portion; keel extensions adapted to be arranged in said sockets, arranged through the ends of the said cross-rib-connecting strap; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

6. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; suitable ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in the said grooves so that the sections thereof overlap the joints of the said central portion; sockets in the ends of said central portion; keel extensions adapted to be arranged in said sockets, arranged through the ends of said cross-rib-connecting strap; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

7. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; suitable ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; upwardly-projecting pins on said side pieces; rods having oppositely-disposed hooks at their ends adapted to engage the said pins, pivoted to said central portion; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

8. In a folding boat, the combination of a suitable flexible skin; suitable gunwales; suitable ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in the said grooves so that the sections thereof overlap the joints of the said central portion; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

9. In a folding boat, the combination of a suitable skin; suitable gunwales; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapping ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a collapsible keel arranged over said cross-ribs, adapted to apply tension to the said connecting-strap thereof when inserted into position; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots, adapted to engage said keel when in position; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said seat-supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

10. In a folding boat, the combination of a suitable skin; suitable gunwales; longitudinal ribs; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a collapsible keel arranged over the said cross-ribs, adapted to apply tension to the said connecting-strap thereof when inserted into position; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to the said seat-supports and to each other by transversely-arranged pivots, adapted to engage said keel when in position; a seat-board; loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said seat-supports as said braces are forced into position; and a standard pivoted to said braces adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

11. In a folding boat, the combination of a suitable skin; suitable gunwales; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapping ends of said rib-sections; cross-ribs arranged over the said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a collapsible keel arranged over said cross-ribs, adapted to apply tension to the said connecting-strap thereof when inserted into position; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots, adapted to engage said keel when in position; a seat-board; and loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said seat-supports as said braces are forced into position, for the purpose specified.

12. In a folding boat, the combination of a suitable skin; suitable gunwales; longitudinal ribs; cross-ribs arranged over said longitudinal ribs; a collapsible keel arranged over the said cross-ribs, adapted to apply tension to the said connecting-strap thereof when inserted into position; seat-supports having hooks thereon adapted to engage over the said gunwales; braces pivoted to said seat-supports and to each other by transversely-arranged pivots, adapted to engage said keel when in position; a seat-board; and loops on said seat-supports adapted to receive said seat-board, whereby the said seat-board is clamped to said seat-supports as said braces are forced into position, for the purpose specified.

13. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; upwardly-projecting pins on said side pieces; rods having oppositely-disposed hooks at their ends, adapted to engage the said pins, pivoted to the said central portion; sockets in the ends of the said central portion; and keel extensions adapted to be arranged in the said sockets arranged through the ends of said cross-rib-connecting strap, for the purpose specified.

14. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapped end of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; sockets in the ends of the said central portions, and keel extensions adapted to be arranged in the said sockets arranged through the ends of said cross-rib-connecting strap, for the purpose specified.

15. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; up-

wardly-projecting pins on said side pieces; and rods having oppositely-disposed hooks at their ends, adapted to engage the said pins, pivoted to the said central portion, for the purpose specified.

16. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; and side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion, for the purpose specified.

17. In a folding boat, the combination of a suitable flexible skin; cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion, side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; upwardly-projecting pins on said side pieces; rods having oppositely-disposed hooks at their ends, adapted to engage the said pins, pivoted to the said central portion; sockets in the ends of the said central portion; and keel extensions adapted to be arranged in the said sockets arranged through the ends of said cross-rib-connecting strap, for the purpose specified.

18. In a folding boat, the combination of a suitable flexible skin; cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; sockets in the ends of the said central portions; and keel extensions adapted to be arranged in the said sockets arranged through the ends of said cross-rib connecting-strap, for the purpose specified.

19. In a folding boat, the combination of a suitable flexible skin; cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion; side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion; upwardly-projecting pins on said side pieces; and rods having oppositely-disposed hooks at their ends, adapted to engage the said pins, pivoted to the said central portion, for the purpose specified.

20. In a folding boat, the combination of a suitable flexible skin; cross-ribs; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; grooves in the sides of said central portion, and side pieces or portions made up of sections hinged together, arranged in said grooves so that the sections thereof overlap the joints of the said central portion, for the purpose specified.

21. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; supporting-straps adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of sections; side pieces or portions, arranged to overlap the joints of the said central portion secured thereto; sockets in the ends of said central portion; and keel extensions adapted to be arranged in the said sockets, arranged through the ends of said cross-rib-connecting strap, for the purpose specified.

22. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; supporting-straps adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of sections; and side pieces or portions, arranged to overlap the joints of the said central portion secured thereto; for the purpose specified.

23. In a folding boat, the combination of a suitable flexible skin; cross-ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a central portion made up of sections; side pieces or portions, arranged to overlap the joints of the said central portion secured thereto; sockets in the ends of said central portion; and keel extensions adapted to be arranged in the said sockets, arranged through the ends of said cross-rib-connecting strap, for the purpose specified.

24. In a folding-boat, the combination of a suitable flexible skin; cross-ribs; a centrally-arranged connecting-strap for said cross-ribs; a combined keel and bottom consisting of a

central portion made up of sections, and side pieces or portions, arranged to overlap the joints of the said central portion secured thereto, for the purpose specified.

25. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapped ends of said rib-sections; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; side pieces or portions made up of sections hinged together, arranged to overlap the joints of the said central portion secured thereto; sockets in the ends of the said central portion; and keel extensions adapted to be arranged in the said sockets, for the purpose specified.

26. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapped ends of said rib-sections; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; and side pieces or portions made up of sections hinged together, arranged to overlap the joints of the said central portion secured thereto, for the purpose specified.

27. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; supporting-straps adapted to receive the overlapped ends of said rib-sections; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; side pieces or portions made up of sections hinged together, arranged to overlap the joints of the said central portion secured thereto; sockets in the ends of the said central portion; and keel extensions adapted to be arranged in the said sockets, for the purpose specified.

28. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; supporting-straps adapted to receive the overlapped ends of said rib-sections; a combined keel and bottom consisting of a central portion made up of three sections arranged end to end and connected by oppositely-arranged hinges; and side pieces or portions made up of sections hinged together, arranged to overlap the joints of the said central portion secured thereto, for the purpose specified.

29. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps arranged in pairs, adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; and a keel arranged over said cross-ribs, adapted to apply tension to the said connecting-strap therefor, for the purpose specified.

30. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; supporting-straps, arranged in pairs, adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting strap for said cross-ribs; and a keel arranged over said cross-ribs, adapted to apply tension to the said connecting-strap therefor, for the purpose specified.

31. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; and supporting-straps arranged in pairs, adapted to receive the overlapped ends of said rib-sections, for the purpose specified.

32. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; and supporting-straps arranged in pairs, adapted to receive the overlapped ends of said rib-sections, for the purpose specified.

33. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; supporting-straps adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; and a keel arranged over said cross-ribs, adapted to apply tension to the said connecting-strap therefor, for the purpose specified.

34. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other, the sliding sections having eyes therein to receive the sections upon which they are telescoped; and supporting-straps adapted to receive the over-

lapped ends of said rib-sections, for the purpose specified.

35. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; supporting-straps adapted to receive the overlapped ends of said rib-sections; cross-ribs arranged over said longitudinal ribs; a centrally-arranged connecting-strap for said cross-ribs; and a keel arranged over said cross-ribs, adapted to apply tension to the said connecting-strap therefor, for the purpose specified.

36. In a folding boat, the combination of a suitable flexible skin; longitudinal ribs made up of overlapping sections adapted to telescope upon each other; and supporting-straps adapted to receive the overlapped ends of said rib-sections, for the purpose specified.

37. In a folding boat, the combination of a suitable flexible skin; cross-ribs; a centrally-arranged connecting-strap for said cross-ribs; and a keel arranged over said cross-ribs, adapted to apply tension to the said connecting-strap therefor, for the purpose specified.

38. In a folding boat, the combination of seat-supports having hooks thereon, adapted to engage over the gunwales of the boat; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; loops on said seat-supports, adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position; and a standard pivoted to said braces, adapted to be turned up to engage the under side of said seat-board, for the purpose specified.

39. In a folding boat, the combination of seat-supports having hooks thereon, adapted to engage over the gunwales of the boat; braces pivoted to said seat-supports and to each other by transversely-arranged pivots; a seat-board; and loops on said seat-supports, adapted to receive said seat-board, whereby the said seat-board is clamped to said supports as said braces are forced into position, for the purpose specified.

In witness whereof I have hereunto set my hand and seal in presence of two witnesses.

IRA O. PERRING. [L. S.]

Witnesses:
A. J. ALBER,
OTIS A. EARL.