

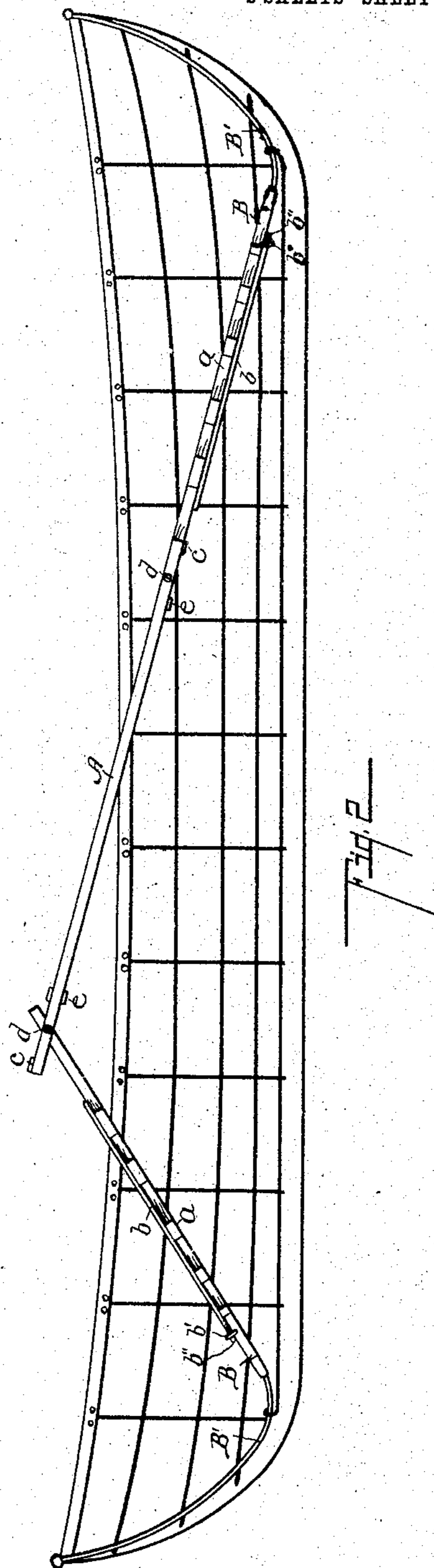
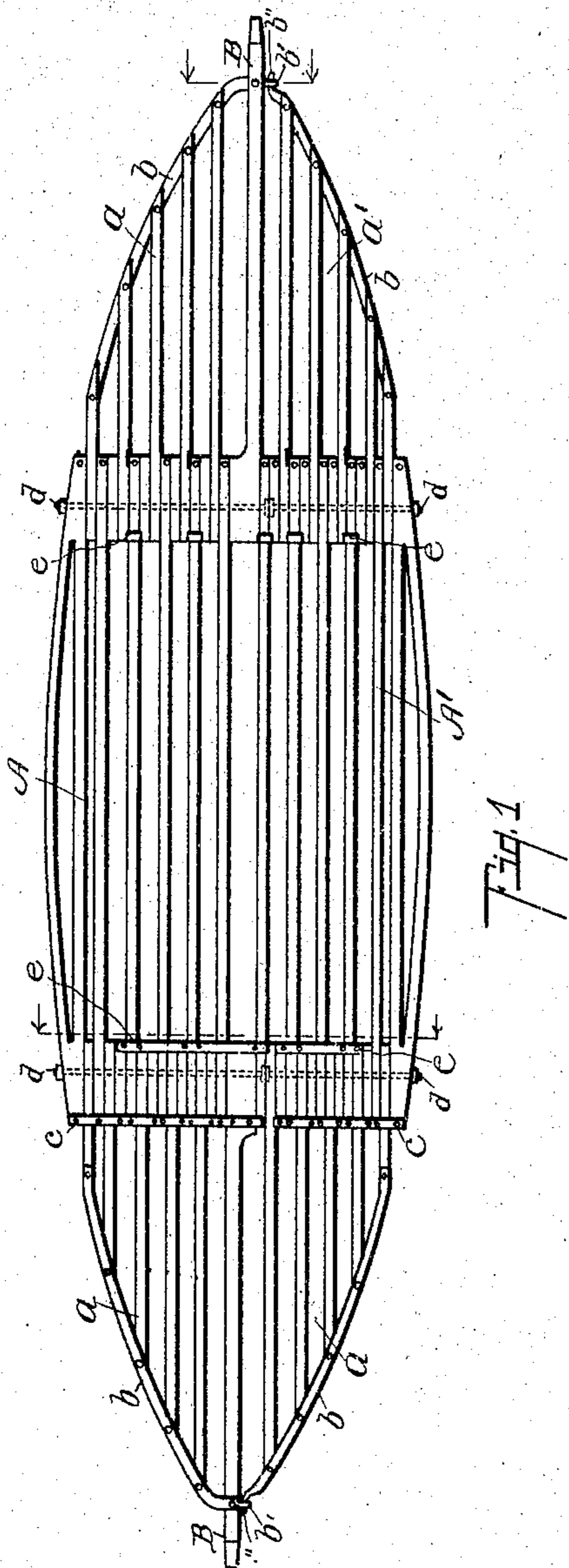
No. 781,052.

PATENTED JAN. 31, 1905.

L. S. DEAL & A. D. GUTCHES.
FOLDING BOAT.

APPLICATION FILED APR. 13, 1904.

2 SHEETS—SHEET 1.



Witnesses:

Mary S. Tooker
Julia Lynch

Inventors,

Lynn S. Deal
Adelbert S. Gutches

By *Edward Tappan*
Att'y.

No. 781,052.

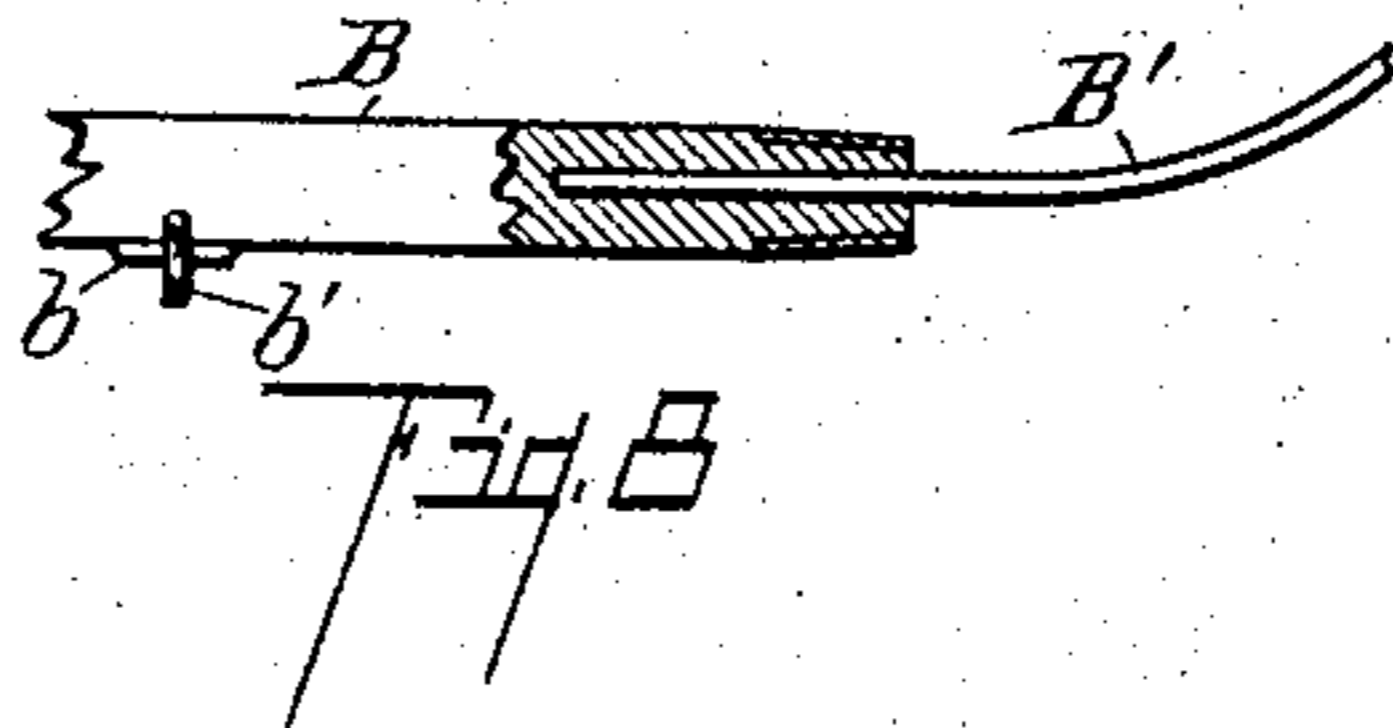
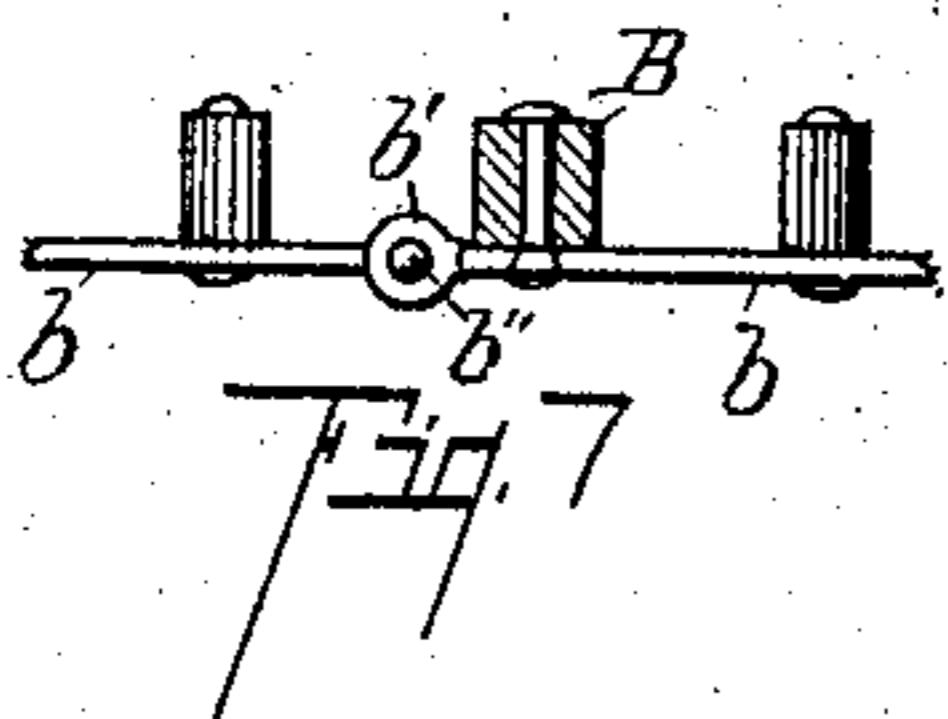
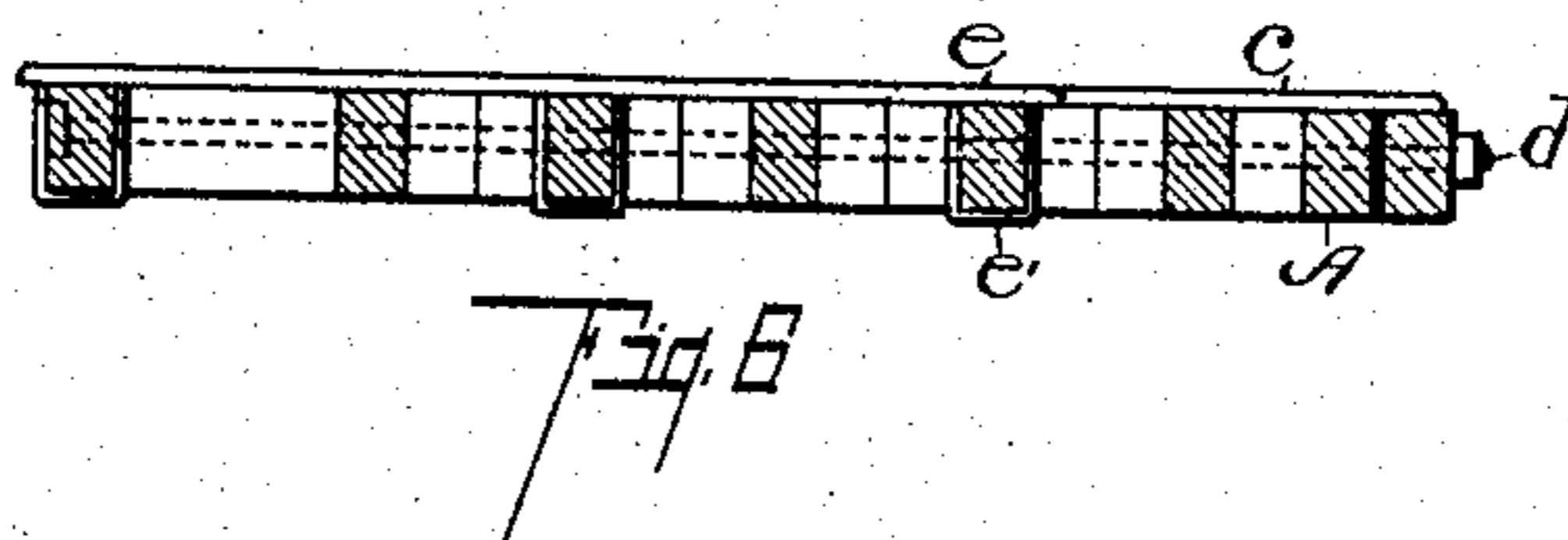
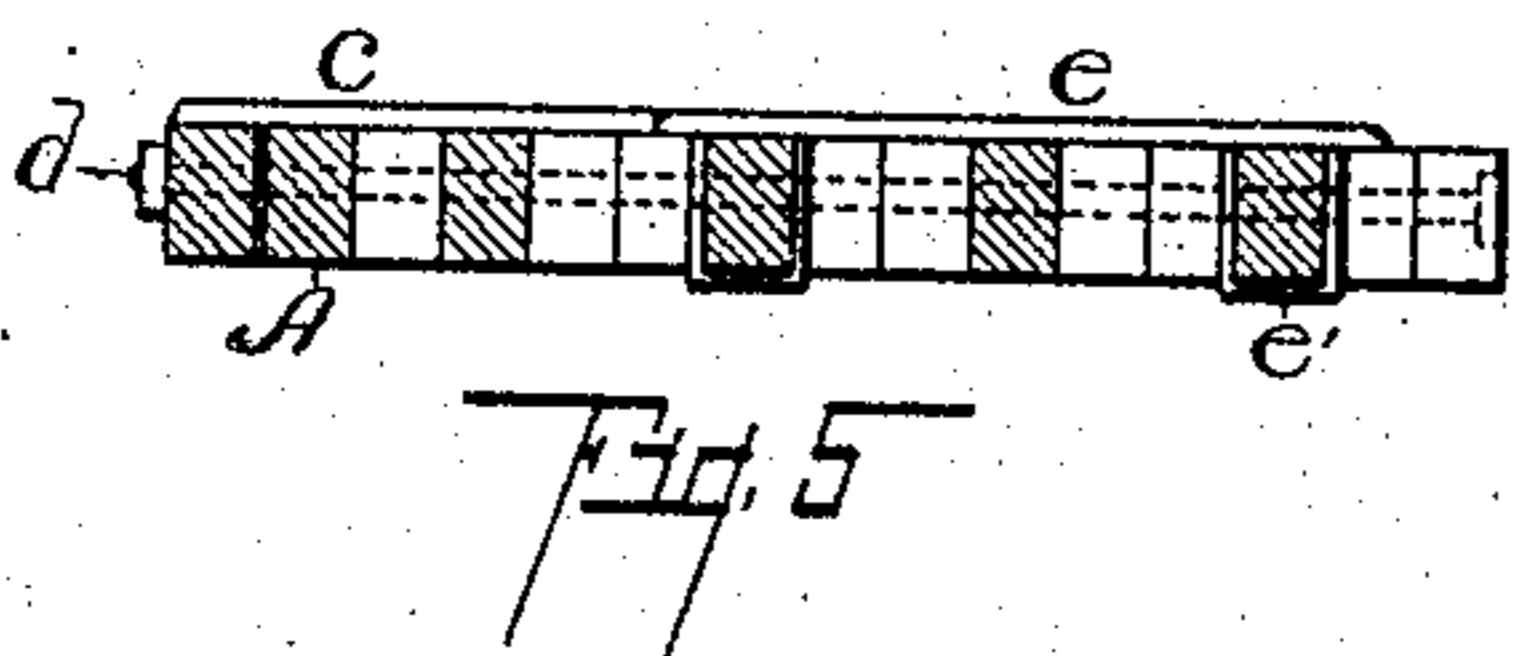
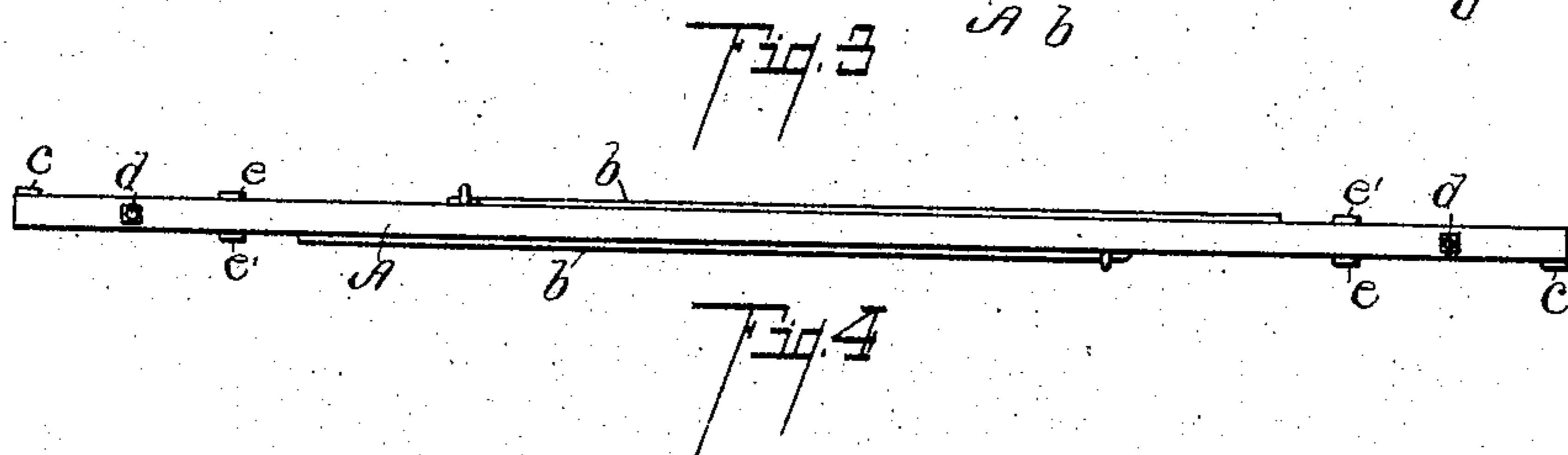
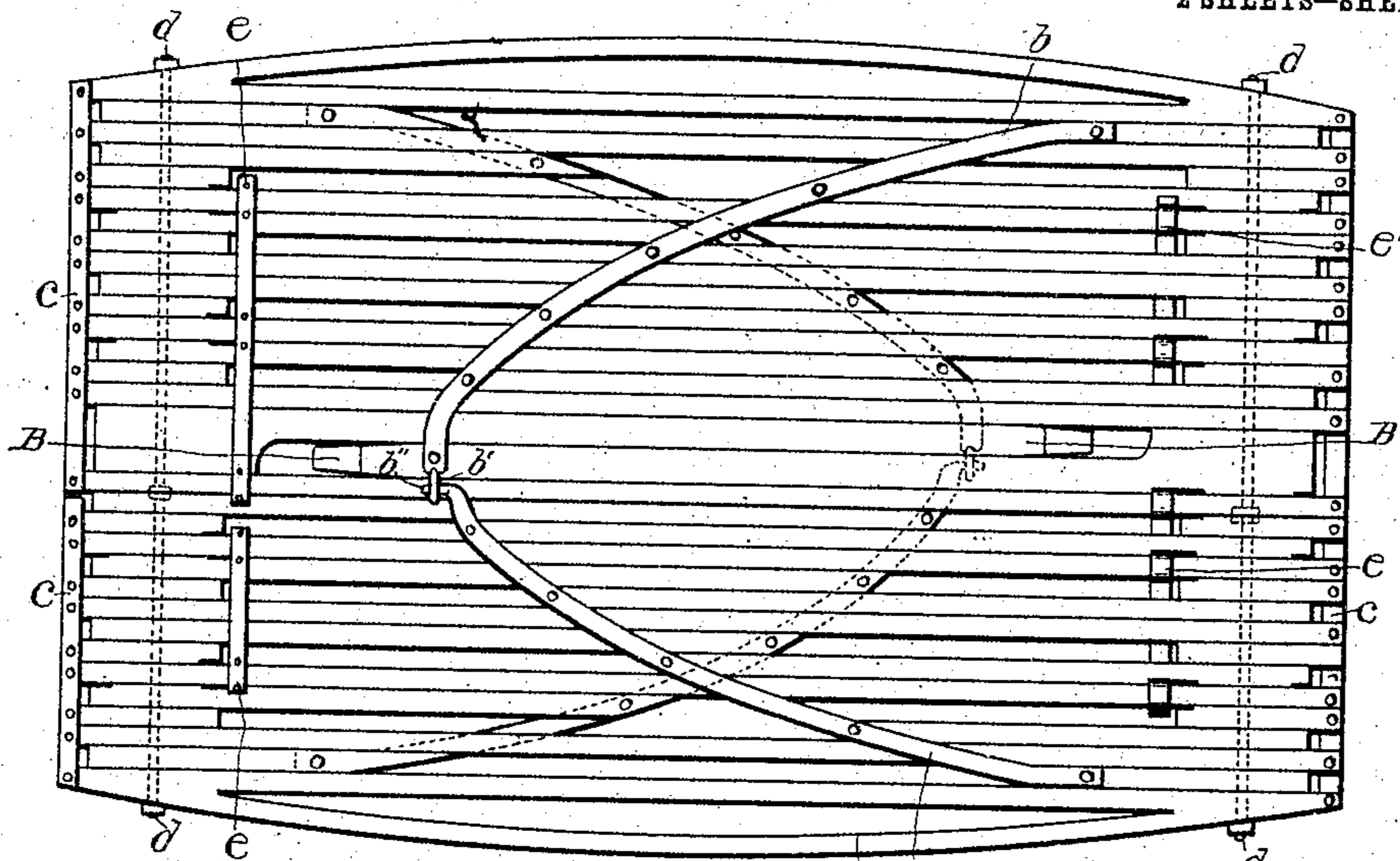
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2 SHEETS—SHEET 2.



Witnesses:

Mary S. Tooker
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UNITED STATES PATENT OFFICE.

LYNN S. DEAL AND ADDISON D. GUTCHES, OF KALAMAZOO, MICHIGAN.

FOLDING BOAT.

SPECIFICATION forming part of Letters Patent No. 781,052, dated January 31, 1905.

Application filed April 13, 1904. Serial No. 203,021.

To all whom it may concern:

Be it known that we, LYNN S. DEAL and ADDISON D. GUTCHES, citizens of the United States, residing at Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented new and useful Improvements in Folding Boats, of which the following is a specification.

This invention relates to certain new and useful improvements in folding boats or boats having a flexible skin of canvas or other suitable material; and the invention consists in the construction, combination, and arrangement of parts hereinafter described and claimed.

The objects of the invention are, first, to produce a folding bottom or keel for boats having a flexible skin, so that the same may be folded into a compact form; second, to produce a folding boat-bottom which will contain the greatest strength when unfolded consistent with lightness; third, to so construct a boat-bottom that it will rest from end to end on the framework of the boat to which it is applied; fourth, to produce a folding boat-bottom in which the end sections fold into the central section, so that the slats forming the end sections lie in spaces between the slats forming the central section, the slats of both sections lying in the same plane when folded; fifth, other objects hereinafter pointed out and claimed. These objects we accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a plan view of the boat-body unfolded. Fig. 2 shows a longitudinal sectional view of a boat with our folding bottom partially inserted therein, illustrating the method of applying the same to a boat. Fig. 3 is a plan view, on an enlarged scale, of the folding bottom, the end sections being folded into the central section. Fig. 4 shows an edge view of the parts shown in Fig. 3. Figs. 5 and 6 show a sectional view on the dotted lines indicated by arrows near the left-hand end of the central section in Fig. 1. Fig. 7 shows a sectional view on the line of the arrows near the extreme right of Fig. 1, illustrating the means of attaching together the

longitudinal divisions hereinafter described. Fig. 8 shows a longitudinal sectional view of the attaching extension, which engages with what is termed the "keel extension," the same being shown on an enlarged plan.

Similar letters refer to similar parts throughout the several views.

The boat-bottom is constructed of longitudinal slats, the central sections having spaces between the slats of sufficient width to receive the slats of the folding end sections. The entire bottom is composed of two what may be termed "longitudinal divisions." These longitudinal divisions are preferably of unequal size and are furnished with suitable means for attachment together. Each division is composed of a central section and two end sections which can be folded into the central section, so that the slats of the end sections and the slats of the central section are in the same plane, presenting no greater thickness when folded than when unfolded. One of the longitudinal divisions is provided at either end with suitable means for engagement with what is termed the "keel extension," thereby making a firm connection between the boat-bottom and the boat proper. When the boat-bottom is extended, it is locked in its extended position by means hereinafter described, so as to possess great strength. The longitudinal divisions are provided with suitable means for attaching the same together at their adjacent edges, and the construction is such that the end sections can be folded into the middle section without separating the longitudinal divisions, or the longitudinal divisions may be first separated and then the end sections folded into their corresponding central section. The latter method is ordinarily used when the folding boat-bottom is packed for storage or for transportation. The central section of one of the divisions is shown by A and of the other division by A'.

a' a' are the folding end sections, which are pivoted to the section A', and a a are the end sections, which are pivotally connected to the central section A.

In the example of our invention shown in the drawings sections a a are provided with

extensions at their ends, as shown by B B, which extensions B B engage with what is termed the "keel extension" B'.

Each folding section is provided with a strap, preferably of iron or other suitable metal, (shown by *b*,) there being a strap for each end section, the strap *b* at one end being attached to one side of the slats of the end section and at the other end to the other side of the slats of the end section. This is shown more clearly in Figs. 2 and 4. In folding the sections together at one end the fold is in a different direction from the other end, so that when the end sections are folded upon the central section the strap *b* at one end lies above the slats of the central section and at the other end below. This is shown clearly in Fig. 4.

b' is an eye upon one of the straps *b*, which engages with the hook *b''* on the strap *b* of its corresponding section. This is shown in Fig. 7, *b'* and *b''* being shown in engagement.

c is a strengthening-strap attached to the ends of the slats which form the central section. The positions of these straps are shown more clearly in Fig. 3.

d d are bolts passing through the slats, connecting the central section to the end sections in such a manner that the end sections may be readily folded. The ends of the end sections project beyond the bolts, so that the sliding locking device may engage the ends of these slats when the end section is unfolded and retain the end section in the unfolded position, said end section when unfolded resting against the connecting-strap *c*.

The locking devices are shown by *e e*, consisting of metal bars having clips *e' e'*, as shown in Figs. 5 and 6. When the end section is open, this locking device is slipped over to engage with the ends of the slats of the section. To unlock the same, it is moved backward, so as to release the ends of the slats on the end sections, allowing the end sections to be folded over the central section. In Fig. 2 the locking device *e* is moved out of position, so as to allow the section shown at the left end of the figure to be folded or unfolded.

In applying the folding boat-bottom to a boat the two divisions may be attached together and one end of the boat-bottom thus attached engaged, as shown at the right in Fig. 2, with the keel extension B'. The section at the other end of the boat-bottom may be bent down, as shown also in said figure, until the socket B will engage with the extension B', shown at the left of the figure, when by pressing down the bottom will lie on the framework of the boat, and the locking device *e* can thus be moved so as to engage with the ends of the slats of the end section and retain the same in a securely-locked position. When the boat-bottom is crowded down into place, it rests upon the framework of the boat from end to

end and also crowds out the keel extension B' into contact with the ends of the boat.

The boat-body is folded in the ordinary manner of collapsible boats, and when the bottom is folded and packed the body of the boat may also be folded and packed with it.

Having thus described our invention, what we claim to have invented, and desire to secure by Letters Patent of the United States, is—

1. In a folding boat, the combination of a flexible skin and framework, a boat-bottom composed of a central section and end sections pivotally connected to the said central section, said central section and end sections composed of longitudinal slats, the slats of the end sections folding into the spaces between the slats of the central section, and suitable means for engaging the folding bottom when unfolded with the body of the boat.

2. In combination with a flexible skin of a folding boat, a boat-bottom composed of a central section made of longitudinal slats, end sections made of longitudinal slats which fold into the spaces between the slats of the central section, pivotal connections between the central section and the end sections, and suitable means for locking the end sections and central section in their open position.

3. The combination with a flexible skin and framework of a folding boat of a boat-bottom composed of a central section made of longitudinal slats having spaces between said slats, end sections made of longitudinal slats having spaces, which end sections fold into the spaces between the slats of the central section, pivotal connections between the central section and the end sections and suitable means for engaging the said unfolded bottom to the boat, and suitable means for unlocking the said unfolded bottom in its unfolded position.

4. The combination in a folding boat of a flexible skin, a folding bottom having a central section and end sections pivotally connected together, said end and central sections constructed of longitudinal slats, the ends of the said sections being pivotally connected to the central section, the slats of the end sections folding between the slats of the central section and connecting-straps on the ends of the end sections, one of said straps lying upon one side and the other upon the other side of the central section when the end sections are folded, and suitable means for connecting the said unfolded bottom to the body of the boat.

5. In a folding boat-bottom the combination of a central section composed of slats having open spaces between said slats, end sections composed of slats having open spaces, the slats on the end sections folding between the slats in the central section, and a pivotal connection between the end sections and the central section.

6. In a folding boat a central section composed of longitudinal slats, pivotal connec-

tions between the end sections and the central section whereby the end sections are folded so that the slats of the end sections lie between the slats of the central section, means carried by the end sections for engagement with the boat-body and suitable means for locking the end sections and central section in an unfolded position.

7. A folding boat-bottom composed of the following parts in combination, to wit: the central section A composed of slats, the end sections *a a*, composed of slats, said end sections folding into the central section, connecting-straps *b b* secured to the ends of the end slats, one of said straps lying on one side of the central section and one on the other side of the said central section when folded, an extension B at each end of said bottom adapted to engage with the framework of the boat.

8. In combination with the skin and framework of a boat-bottom composed of two longitudinal divisions, each division composed of a central section and two end sections, the end sections and the central section being composed of slats, pivotal connections between the central sections and the end sections, both

of the said end sections folding into the central section, locking means for retaining the end sections and central section in their unfolded position, and means for engaging the folding bottom when unfolded with the framework of the boat, substantially as described.

9. A folding boat-bottom composed of the following parts, to wit: a central section A composed of slats, end sections *a a* also composed of slats, said sections being pivotally connected, a strap *b* on each of the said sections, said end sections adapted to fold into the central section, one on either side thereof in such a manner that one strap *b* lies on one side of the central section and one on the other side when said end sections are folded into the central section.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

LYNN S. DEAL.
ADDISON D. GUTCHES.

Witnesses:

H. N. ELWELL,
ASHLEY CLAPP.