(No Model.)

W. H. GAMBLE & D. H. ALLEN.

COLLAPSIBLE PNEUMATIC BOAT.

No. 486,597. Patented Nov. 22, 1892.

Fig. 1.

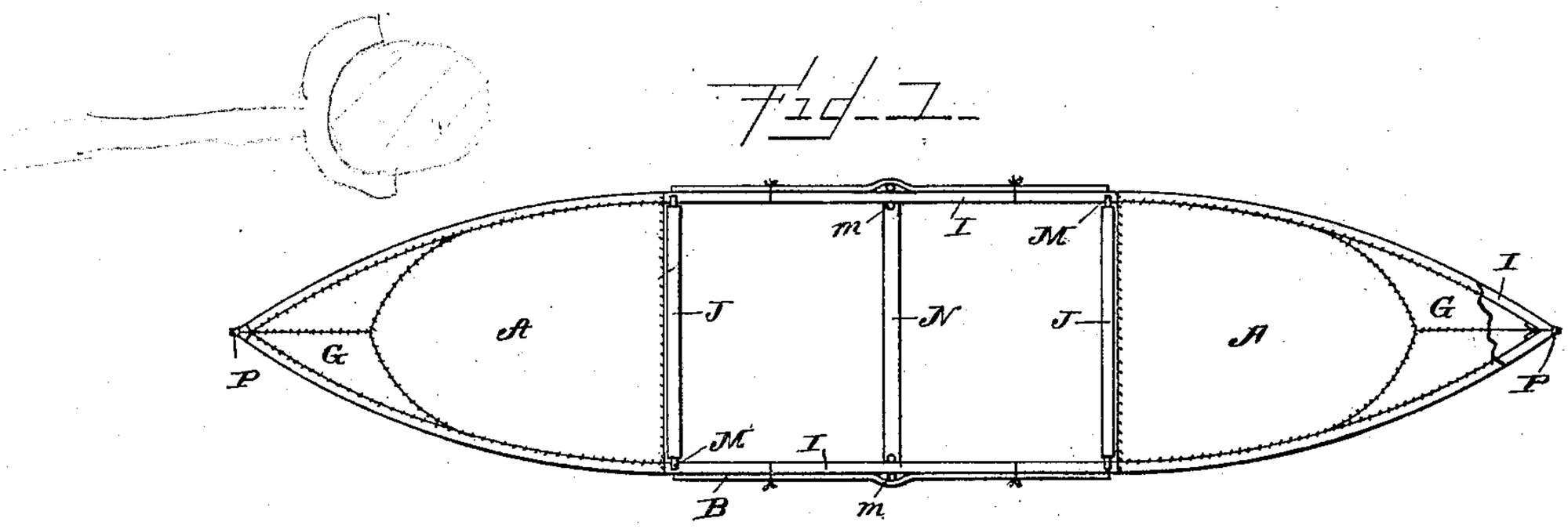


Fig. 2.

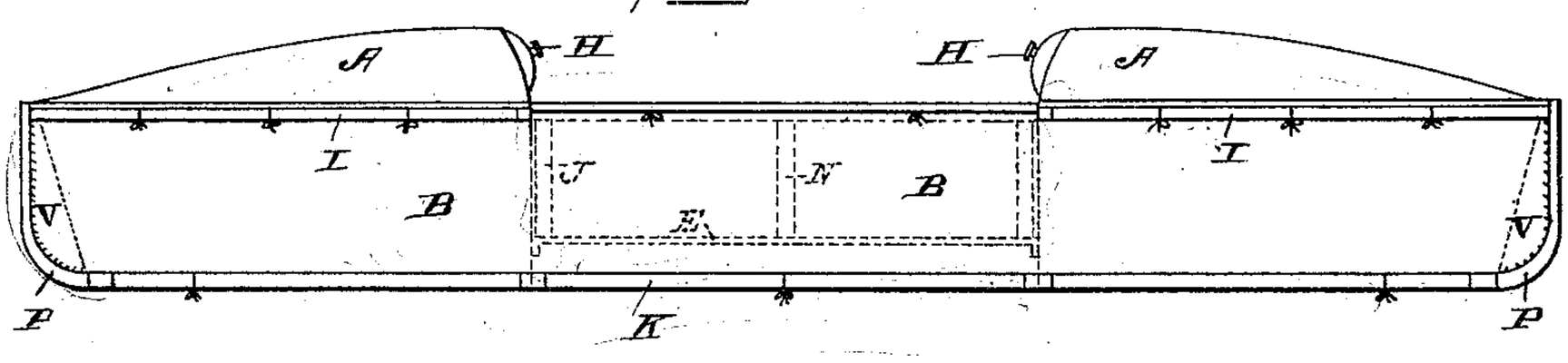


Fig. 3.

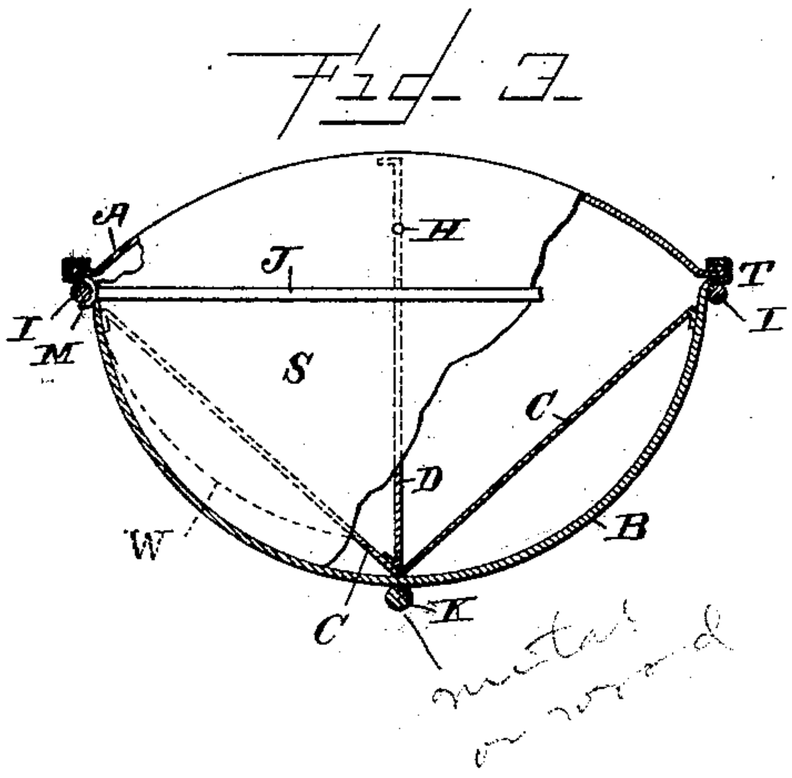
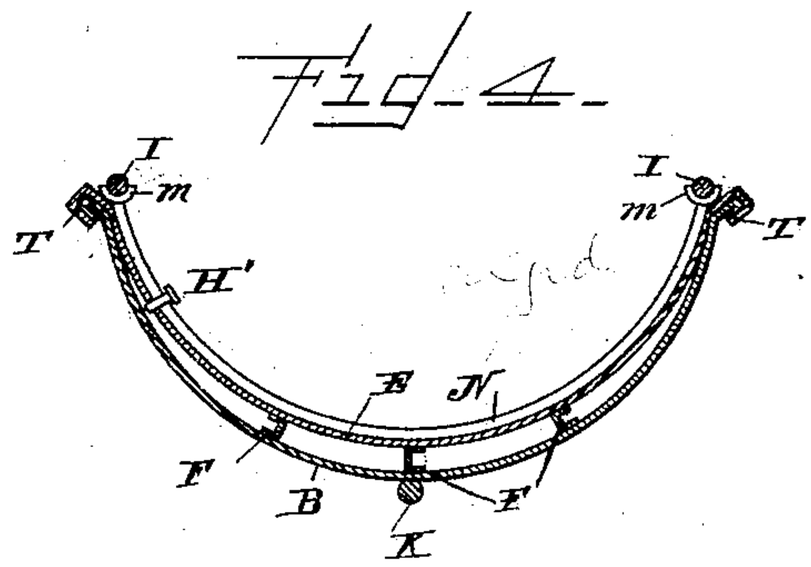


Fig. 4.



Witnesses:

N. J. Collamer.

T. M. Galbraith.

Inventors:

William H. Gamble and

David H. Allen,

By O. M. Smith & Son,

Atty's.

UNITED STATES PATENT OFFICE.

WILLIAM H. GAMBLE AND DAVID H. ALLEN, OF MIAMISBURG, OHIO.

COLLAPSIBLE PNEUMATIC BOAT.

SPECIFICATION forming part of Letters Patent No. 486,597, dated November 22, 1892.

Application filed March 8, 1892. Serial No. 424,163. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. GAMBLE and DAVID H. ALLEN, both citizens of the United States, and residents of Miamisburg, county of Montgomery, and State of Ohio, have invented a new and useful Improvement in Collapsible Pneumatic Boats, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

The object of our invention is to provide a light collapsible boat, depending for its boat shape upon inflation by air, and having for purposes of additional strength and safety a light, detachable, and folding framework. With the exception of such auxiliary framework the boat is made entirely of pieces of flexible (preferably textile) material rendered air-tight, provided with suitable air-valves, and connected with air-tight joints or seams. The boat is divided lengthwise into three sections—an open or well section amidships and two decked-over sections, one at either end of the boat. Each decked section is divided from the well-section by an air-tight partition and is provided with an air-valve and with a suitable number of stays arranged to hold the section to the required form when the section is inflated. The open or well section is constructed with double walls with an air-space between the walls. It is provided with an air-valve and stays, suitably arranged to hold the section in the proper shape when the section is inflated. When the sections are not made separate and detachable, the ends of the inner wall of the well-section are fastened to the partitions dividing the decked sections from the well-section with an air-tight seam, and the outer wall of the well-section forms one continuous piece of fabric with the outer walls or sides and bottom of the decked sections. These sections may, however, be made separate and detachable. They are then inclosed in an outer boat-shaped sack, and the two walls of the well-section are fastened together at the ends of the well with an air-tight seam, and are not connected with the partitions dividing the decked sections from the well-section.

Referring to the annexed drawings, which form a part of this specification, Figure 1 represents a plan or top view of the boat. Fig. 2 represents a side elevation of the boat. Fig. 3 represents a cross-sectional view through one of the decked-over sections, and Fig. 4 is a similar view taken through the well-section.

Referring to Fig. 3, the deck A and the sides and bottom of the boat B consist, preferably, of two pieces of light flexible material rendered air-tight, joined by air-tight seams T, or they may consist of a single piece of fabric joined with a single seam. The two triangular pieces G G in Fig. 1 are flaps or extensions of the sides of the boat B in Figs. 2, 3, and 4, brought together and fastened with an air-tight seam, the deck A being fastened to them with the air-tight seam. The partition S, in which is fastened the air-valve H, is made of flexible air-tight fabric fastened with an air-tight seam to the edges of the deck A and the sides and bottom B. The stays C, D, and C are made of flexible fabric and extend from the partition S to the end of the boat. The stays C C consist of a single piece of fabric sewed along the bottom of the boat, over the keel, and to the sides of the boat at about the point where the sides and deck meet. The stay D is sewed to the bottom of the boat, over the keel, and along the center of the deck. These stays are intended, primarily, to hold the boat in its proper shape when inflated and to add strength to the boat. They may, however, be used as partitions to divide the decked sections into two or more separate air-tight sections or chambers. To adapt them to this latter purpose the stays are made of air-tight fabric and joined to the bottom, sides, and deck of the boat, as indicated, but with air-tight seams, and one end of each stay is fastened with an air-tight seam to the partition S and the opposite end is held by the seam V, Fig. 2, which holds the sides B together at the ends of the boat. When the stays C, D, and C are not used to divide the decked sections into separate air-chambers, their ends are left free, being fastened neither to the partition S nor fastened together at the ends of the boat, and the air introduced through the air-valve H circulates among the stays and presses equally against all parts of the sides and bottom B and the deck A. When the decked sections are divided into separate air-chambers, each chamber is pro-

vided with an air-valve, which may be set either in the partition S or in the deck A. The object of the sub air-chambers is to increase the safety of the boat.

The open or well section of the boat is provided with double sides and bottom E and B, Fig. 4, with an air-space between. The walls E and B consist, preferably, of two pieces of air-tight fabric joined together with two air-tight seams, as at T, or they may consist of a single piece of fabric with a single seam. The well-section is also provided with an air-valve H′, fastened to the inner wall E at a point immediately under the gunwale on one side. When the well-section is not made separate and detachable from the decked sections, the outer wall B forms one continuous piece of fabric with the sides and bottom B of the decked sections, and the inner wall E has its ends fastened with air-tight seams to the partitions S, as indicated by the dotted line W in Fig. 3. When the well-section is made separate and detachable from the decked sections, the outer wall B, Fig. 4, and the inner wall E, Fig. 4, of the well-section are fastened together at their ends with an air-tight seam. The stays F, Fig. 4, are pieces of fabric running the entire length of the well-section, each stay having one edge sewed to the inner wall E and its opposite edge sewed to the outer wall B of the well-section. The stays are intended to hold the well-section to its proper shape when inflated.

The gunwales I, in Figs. 1, 2, 3, and 4, are formed of two strips of wood or metal of suitable fexibility, hinged together at their ends, and each of said strips is formed of two or more shorter strips joined with ferrules, as shown, or in any suitable manner. The gunwales are attached to the sides of the boat with rope-lashings or in other suitable manner.

The thwart J, Fig. 3, is a piece of wood or metal provided at its ends with yokes M, which engage the gunwales when the thwart is in place. The object of the thwart is to add strength to the boat.

The boat has one or more ribs or braces N, Fig. 4, adapted to be placed in the open or well section. This rib may be of any desired shape, either curved or angular, with straight bottom and sides. At its tops or ends it is provided with yokes *m*, which engage the gunwales when the rib is in position. The rib is held in place by the pressure against it of the sides and bottom of the inner wall E of the well-section when the section is inflated.

At the ends of the boat are wooden or metal stem-posts P, Fig. 2. These are attached to the boat by rope-lashings or in any suitable manner. The keel K is a strip of wood or metal composed of two or more shorter strips joined with ferrules or in any other suitable manner. The ends of the keel press against the lower ends of the stem-posts P, as shown in Fig. 2, and the keel is held underneath the boat by rope-lashings or in any suitable manner.

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

1. As a new article of manufacture, a pneumatic collapsible boat made of textile or other suitable flexible material rendered air-tight and having air-tight decked-over end portions provided with air-valves and separated from an open or well portion by air-tight partitions, and an air-tight open or well portion having double sides and bottom with an air-space between the double sides and bottom and provided with an air-valve, the whole being adapted to take a boat-shape and remain extended by means of inflation, substantially as described.

2. In a pneumatic collapsible boat composed entirely of air-tight flexible material, the decked inflatable end sections, in combination with an intermediate inflatable open or well section having double sides and bottom walls connected by flexible stays which hold said walls in proper relation to each other when said section is inflated, substantially as described.

3. In a pneumatic collapsible boat composed of air-tight flexible material, air-tight end sections having the sides and bottom B, deck A, transverse partitions S, and provided with flexible stays C, C, and D, in combination with an interposed open or well section, substantially as described.

4. In a pneumatic collapsible boat, an air-tight end section formed by the deck A, the sides and bottom B, and the transverse partition S, all composed of flexible air-tight material, said section being divided into two or more separate chambers by and in combination with the partitions C, D, and C, which also answer the purpose of stays, and the air-valve H, substantially as described.

5. In a pneumatic collapsible boat composed of air-tight flexible material, an inflated open or well section having double side and bottom walls and interposed between closed or decked and inflatable end sections.

6. In a pneumatic collapsible boat composed of air-tight flexible material, an open or well section located between two decked and air-tight sections and having double side walls and bottom connected at suitable intervals by longitudinally-arranged flexible stays.

7. A pneumatic collapsible boat composed of air-tight flexible material, the inflatable decked end sections and intermediate open or well section having the double side walls and flexible stays connecting said walls, in combination with the stem-posts P P, connected to said end sections, and the jointed and detachable keel connected to said stem-posts and secured underneath the several collapsible boat-sections, substantially as described.

8. A pneumatic collapsible boat made of

flexible material rendered air-tight and having decked-over end portions provided with air-valves and separated from an open or well section by air-tight partitions, and an open or well portion having double sides and bottom with an air-tight space between and provided with an air-valve, in combination with the hinged detachable gunwales I, the detachable keel K, fastened underneath the boat, the stem-posts P, fastened at the ends of the boat, and one or more ribs or braces N, provided at their ends with yokes *m* to engage the gunwales and adapted to be held in place by the pressure against them of the sides and bottom of the inner wall E of the well-section.

In testimony whereof we have hereunto set our hands this 5th day of March, A. D. 1892.

WILLIAM H. GAMBLE.
DAVID H. ALLEN.

Witnesses:
AMOS K. CLAY,
C. W. DODDS.