

W. B. MOTHERAL.
BOAT.
APPLICATION FILED FEB. 27, 1908.

900,296.

Patented Oct. 6, 1908.

2 SHEETS—SHEET 1.

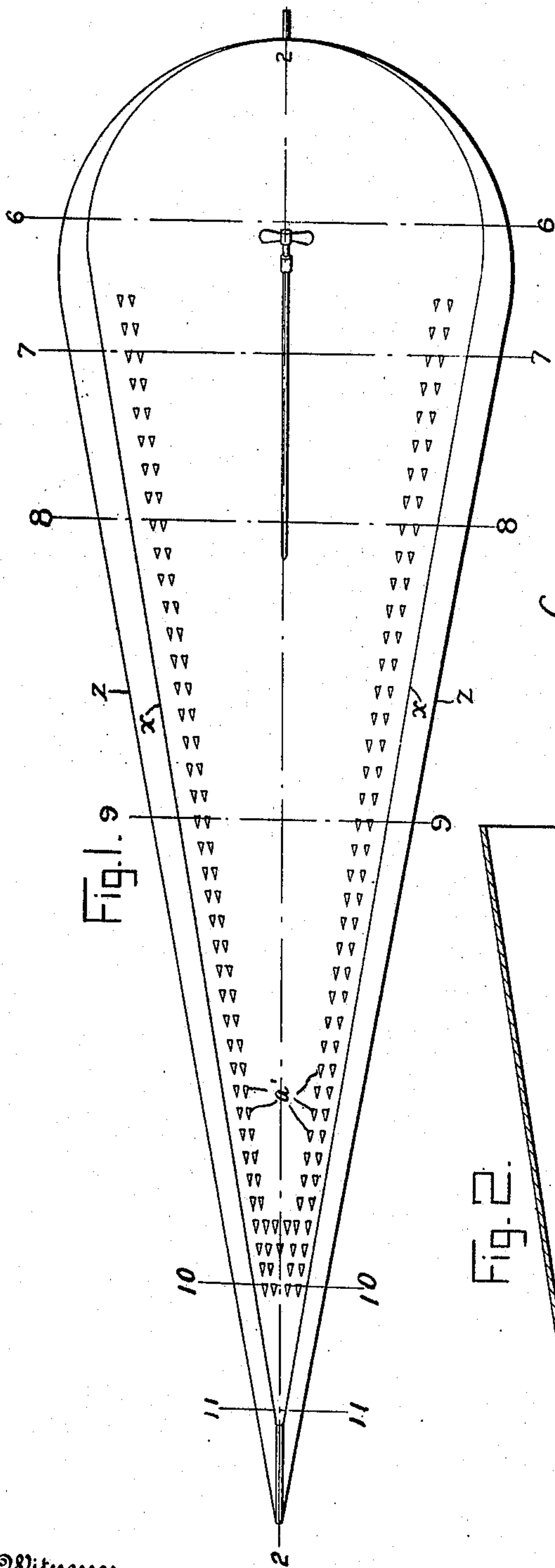


Fig. 1.

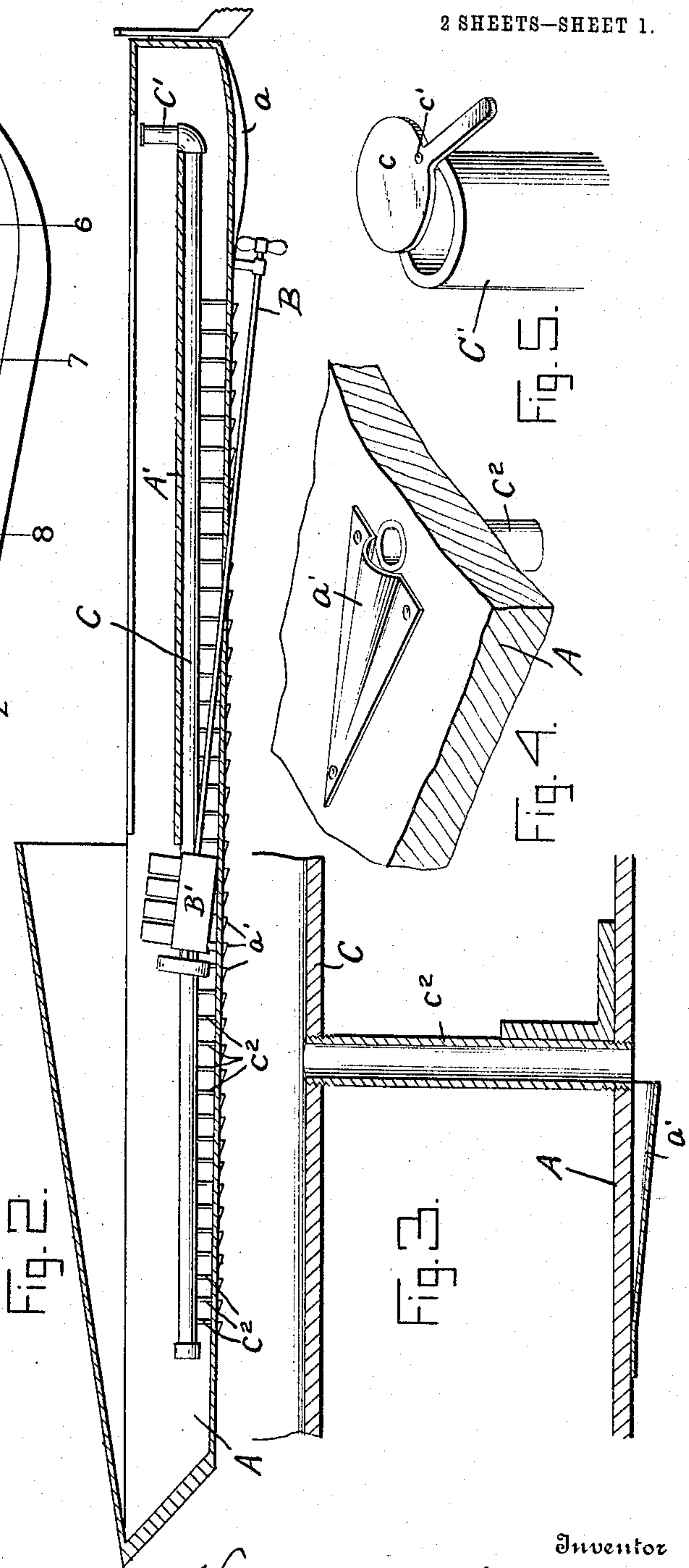


Fig. 2.

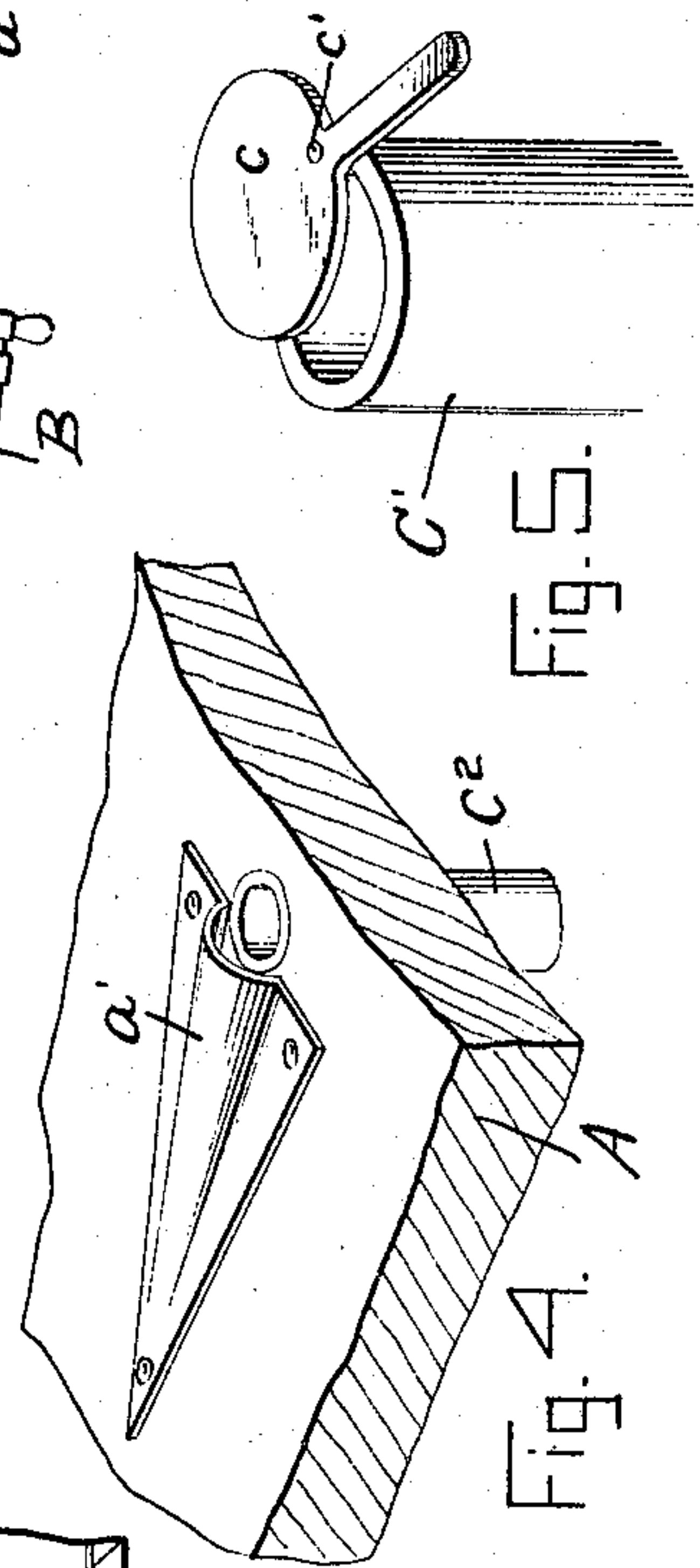


Fig. 3.

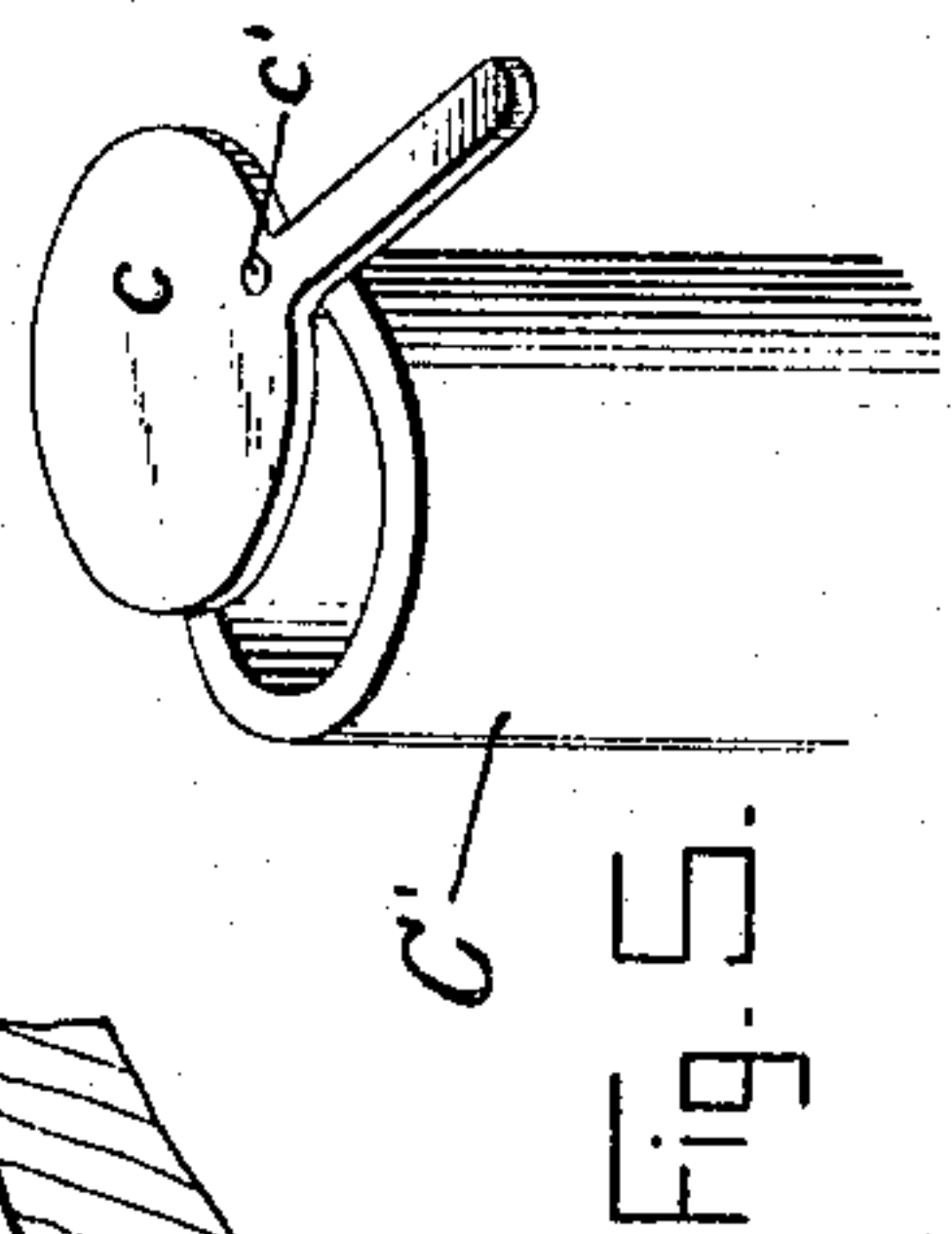


Fig. 4.

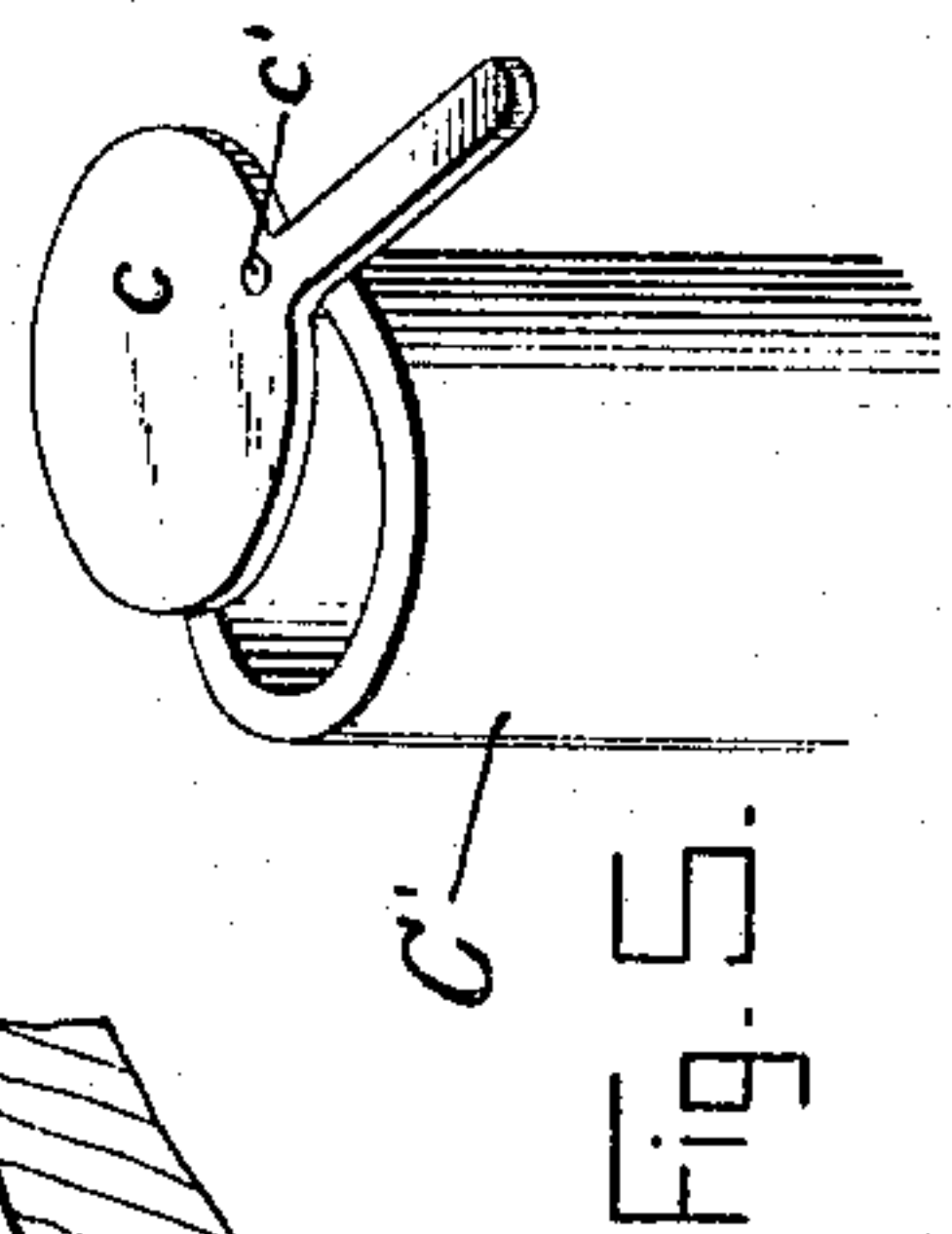


Fig. 5.

Witnesses

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2 SHEETS—SHEET 2.

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Fig. 6.

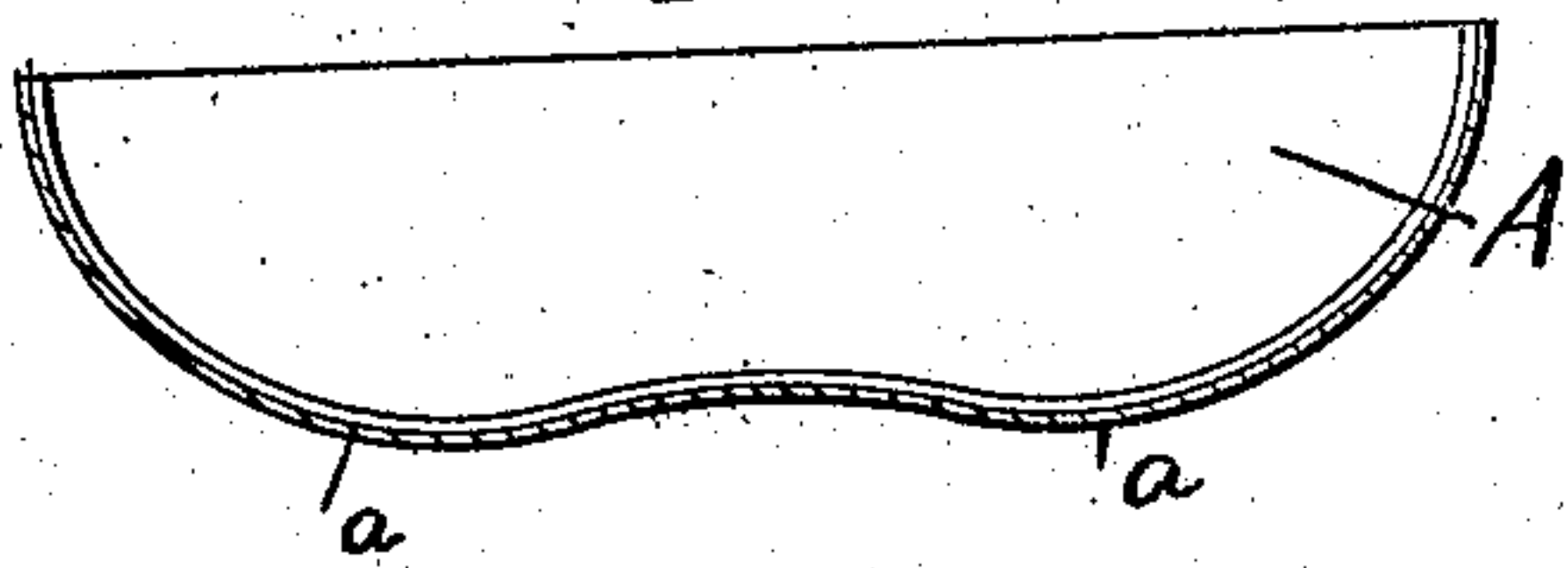


Fig. 7.

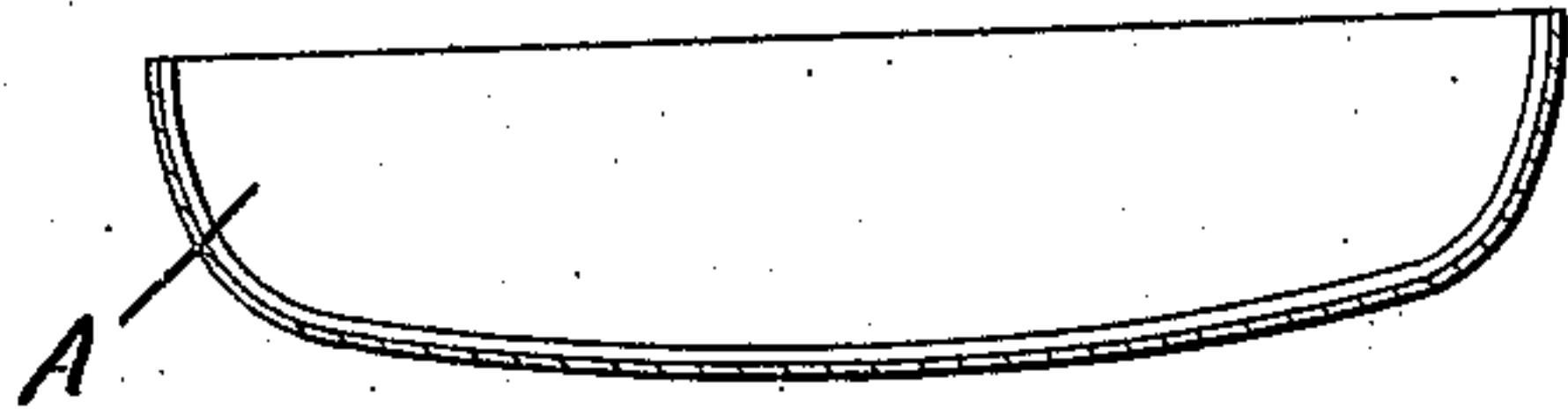


Fig. 8.

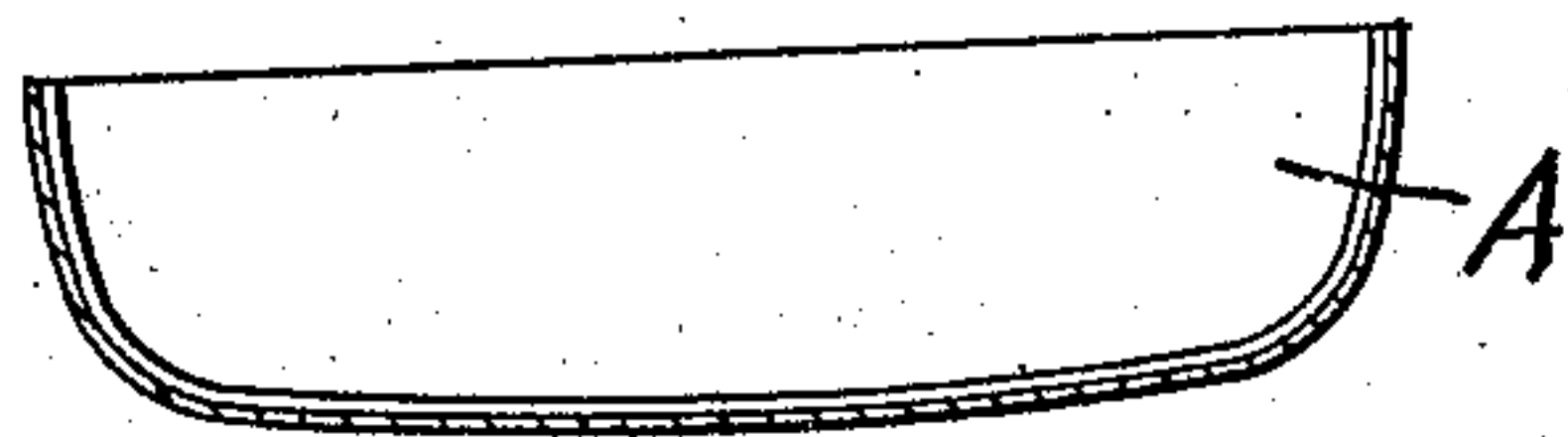


Fig. 9.

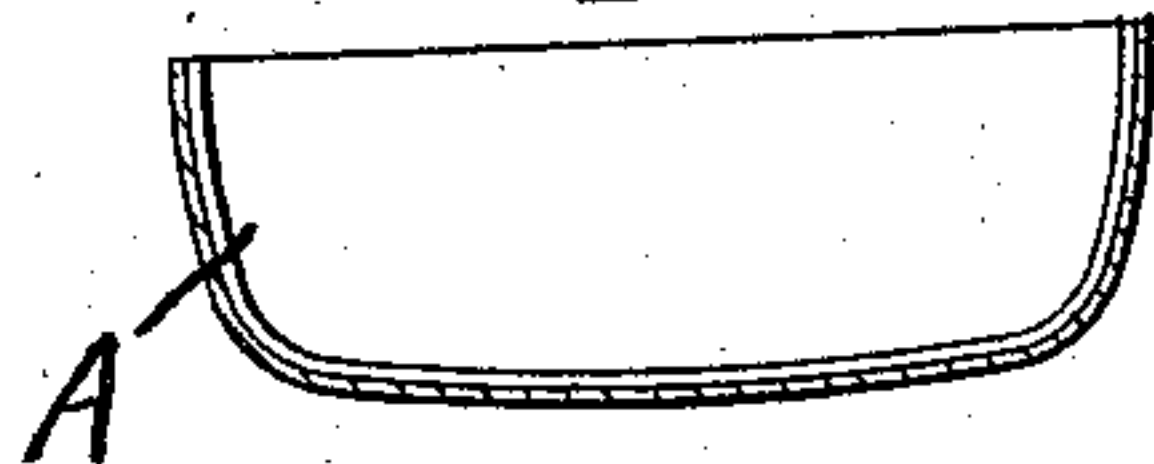


Fig. 10.

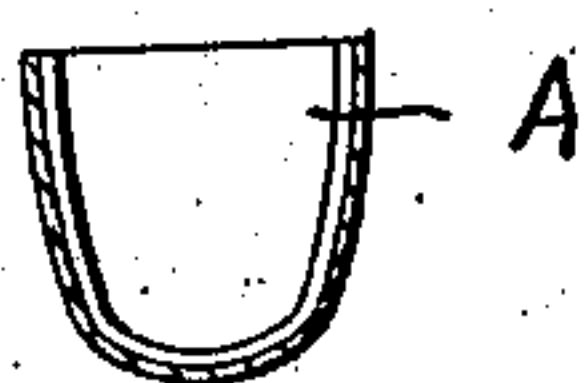
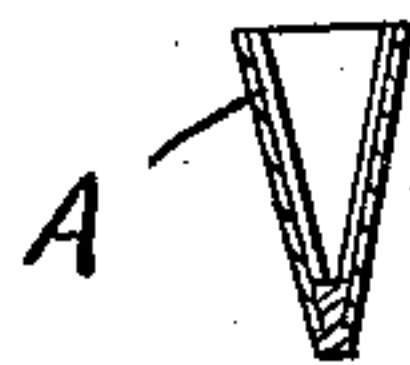


Fig. 11.



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UNITED STATES PATENT OFFICE.

WILLIAM B. MOTHERAL, OF WASHINGTON, DISTRICT OF COLUMBIA.

BOAT.

No. 900,296.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed February 27, 1908. Serial No. 418,058.

To all whom it may concern:

Be it known that I, WILLIAM B. MOTHERAL, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Boats, of which the following is a specification.

My said invention consists in certain improvements in the shape of the hull and in details of construction of boats of that particular character shown in former patents issued to me, formed with wedge-shaped hulls and wherein air is forced under the boat to form a cushion between its bottom and the water to facilitate its propulsion, whereby such a boat is rendered more perfect in its construction, and improved results may be attained, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is the under side plan of the hull of one of my boats embodying said improvements, Fig. 2 a central longitudinal section through the same, Figs. 3, 4 and 5 detail views illustrating features of construction on an enlarged scale, and Figs. 6 to 11 inclusive cross sections through the hull of the boat at the several points indicated by the several dotted lines in Fig. 1, to show more clearly the particular shape of the bottom and sides of said hull.

In said drawings the portions marked A represent the hull of the boat, B the propeller shaft, and C an air-supply main or tube.

The particular shape of the hull A will be best understood by careful examination of Fig. 1 in connection with the cross sections 6 to 11. It may be stated that the bottom of the boat is curved in cross section, said bottom, as bounded by the lines $x-x$ in Fig. 1, being in the form of a section taken off one side of a perfect cone, the radius of the circle or curvature increasing regularly from the bow towards the stern, the sides of the hull, being the space between the line x and the line z as indicated in Fig. 1, are also curved, the curvature being the greatest at a point near the stern, as shown in Fig. 6, and gradually flattening toward the bow until at the bow of the boat the sides are flat or plain, as shown in Fig. 11. At each side near the stern the bottom is formed with portions a slightly bulged down, or curved downwardly

from the straight level of said sides. By this means the boat is not only steadied on its bottom but as its speed increases these bulged-down portions have a tendency to cause the stern of the boat to ride over the water, raising it so that its draft decreases as its speed increases, and also serve to keep the bow of the boat from rising unduly. The general shape of the hull just described serves to cause the boat to rise upwardly in the water as its speed increases and to cause it in a large measure to skim, or glide, over the water when under great speed, thus enabling unusual speed to be attained at a comparatively small expenditure of power. The bottom of the boat is perforated along lines parallel with its sides, as shown most clearly in Fig. 1, and the perforations are protected by deflector shields a' also formed wedge-shaped and curved downwardly from the bottom of the boat, thus being also in the form of cone sections, and one located immediately in front of each perforation. The form of said shields is such that in passing over the water each shield serves to divide the water immediately in front of the adjacent perforation and form a channel to receive the air as well as to cause a suction to draw the water downwardly, as will be presently described. I have shown two rows of such holes along the entire length of the boat and additional holes between said rows near the bow. It will be understood, of course, that as many rows as desired or found advantageous may be used and any other suitable arrangement employed.

The propeller shaft B is mounted in suitable bearings being provided with a propeller b on its outer end and connected with an engine B' at its inner end conveniently located within the boat. The propeller and engine are, or may be, of any suitable construction and arrangement and are not particularly shown, being no part of the present invention.

The air-tube, or main, C extends horizontally between the deck A' and the bottom of the boat, being provided at its rear end with the upwardly extending branch C' the top end of which is provided with a valve c secured thereon by means of a pivot c' . A small supply pipe c'' connects each of the perforations in the bottom of the boat under the shields a' with said air-tube, or main.

In operation, the boat being driven rapidly through the water, its cone-shaped bottom

and taperingly curved sides will cause it to gradually rise out of the water until its draft is very slight, while the suction caused by the boat gliding over the water will draw the air through pipes C' , C and c^2 by suction and discharge it under the boat behind the shields a' , causing a thin layer or cushion of air to be thus injected under the boat, thereby buoying up the boat and reducing its friction upon the water as well as its draft and facilitating its propulsion. When it is desired to stop the boat, or increase the friction between the boat and the water, the supply of air is cut off by closing the valve c , when the supply of air will cease and the natural friction and pressure of the water will assist in retarding the progress of the boat.

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

1. A boat comprising a hull the bottom of which is in the form of a section of a cone, having bulged-down portions on each side near the stern and the sides of which are formed curved at the stern and gradually flattened from the stern to the bow, substantially as set forth.

2. A boat comprising a hull formed wedge-shaped with its bottom in the form of a section of a cone and its sides curved outwardly at the stern and gradually decreasing in curvature until they run into flat portions at the bow, substantially as set forth.

3. A boat comprising a hull the bottom whereof is curved in cross section, the curvature gradually decreasing from the bow toward the stern and formed with bulged-down portions on each side near the stern and having sides curved outwardly near the stern and decreasing in curvature from the stern toward the bow, substantially as set forth.

4. A boat comprising a hull the bottom of which is curved in cross section, the curvature decreasing from the bow toward the stern, perforations in said bottom, an air-supply system connected with said perfora-

tions, and deflectors in the form of a section of a hollow cone attached to the bottom of said boat immediately in front of each of said perforations with the point of the cone towards the bow of the boat, substantially as set forth.

5. A boat comprising a hull formed with perforations in its bottom, an air-supply system connected with each of said perforations, a valve controlling the flow of air through said supply system, and a deflector shield on the bottom of said boat adjacent to the front side of each of said perforations, each of said shields being in the form of a section of a hollow cone with the point of the cone toward the bow of the boat, substantially as set forth.

6. The combination, with a boat having a perforated bottom and provided with an air-supply system, of a deflector on the bottom of said boat adjacent to the front edge of each of said perforations and made in the form of a section of a hollow cone and arranged with its point toward the bow of the boat, substantially as set forth.

7. A boat comprising a hull formed wedge shaped and having a bottom in the form of a section of a cone and sides curved outwardly at the stern and gradually flattening toward the bow, an air-supply system in said boat connected with a series of perforations in the bottom thereof, and a wedge-shaped deflector on the bottom of said boat adjacent to the front edge of each perforation with the narrow part of said deflector arranged toward the bow of the boat, substantially as set forth.

In witness whereof, I, have hereunto set my hand and seal at Washington, D. C., this 26th day of February, A. D. nineteen hundred and eight.

WILLIAM B. MOTHERAL. [L. S.]

Witnesses:

E. W. BRADFORD,
R. M. PARKINS.