

(No Model.)

2 Sheets—Sheet 1.

C. P. PITMAN & H. ALLAIRE.

MANUFACTURE OF BOATS FROM CELLULOID, &c.

No. 291,533.

Patented Jan. 8, 1884.

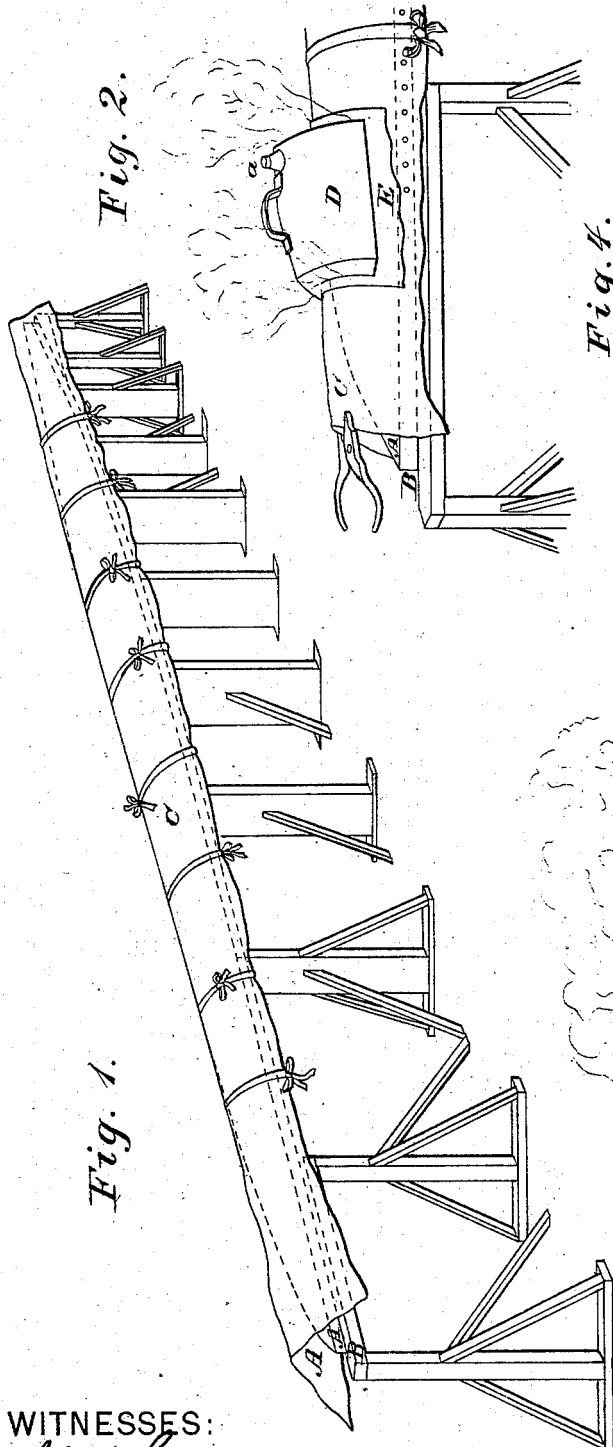


Fig. 1.

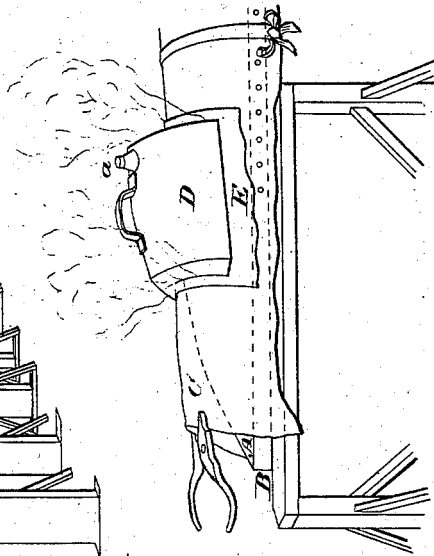


Fig. 2.

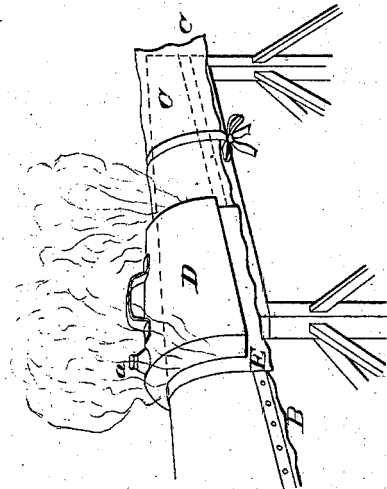


Fig. 4.

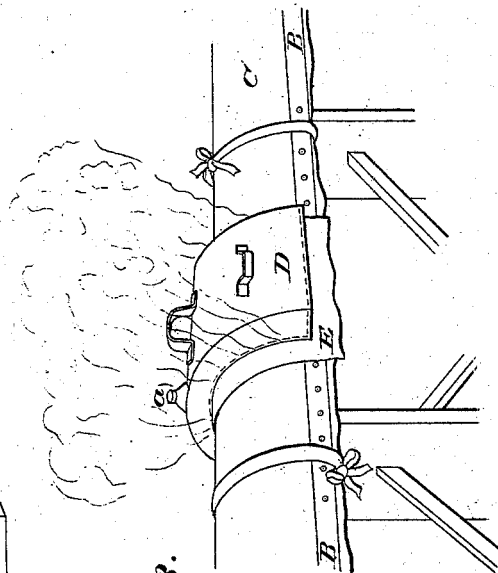


Fig. 3.

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(No Model.)

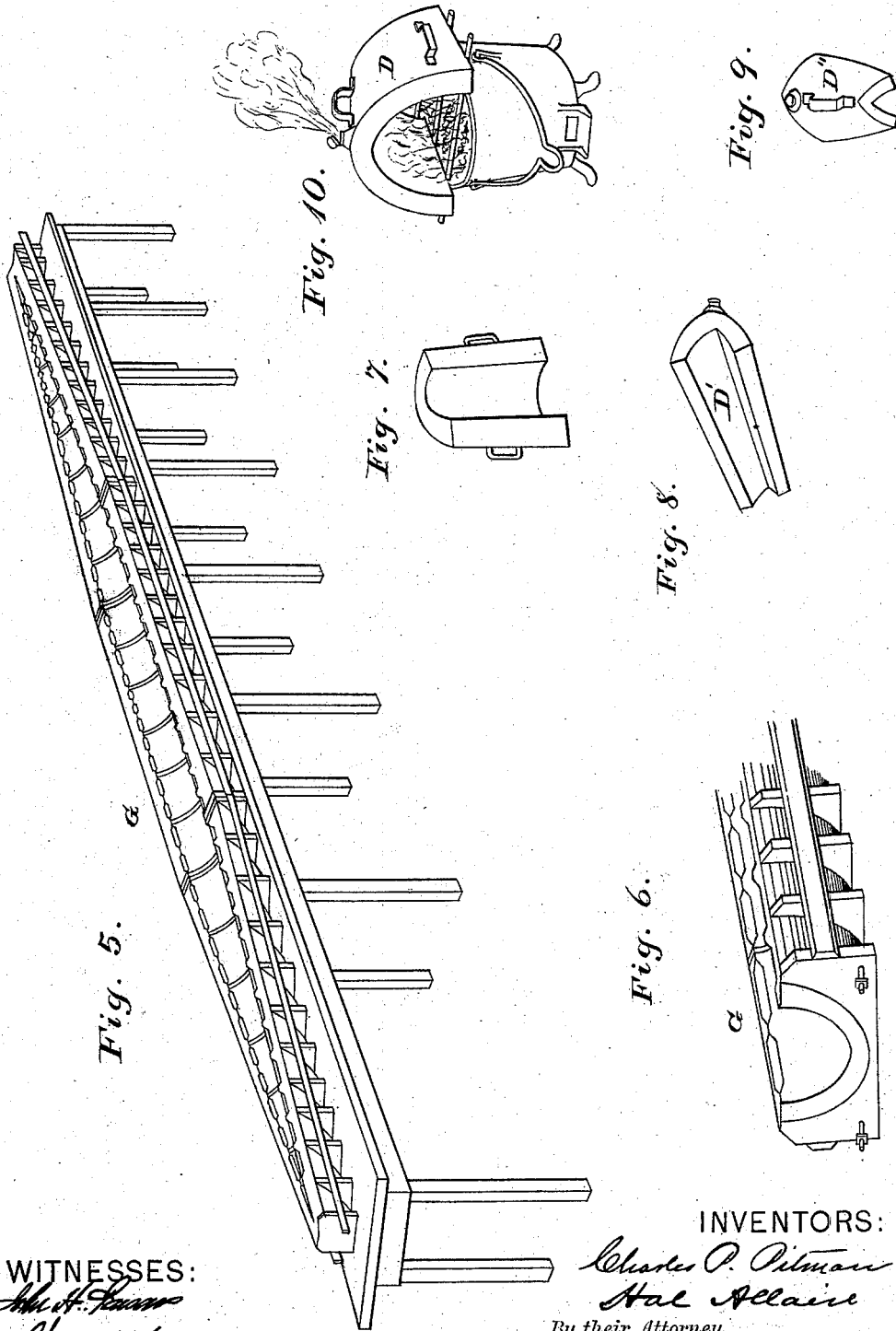
2 Sheets—Sheet 2.

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WITNESSES:

*Wm. H. ...*  
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INVENTORS:

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# UNITED STATES PATENT OFFICE

CHARLES P. PITMAN, OF FREEHOLD, AND HAL ALLAIRE, OF ALLAIRE, N. J.

## MANUFACTURE OF BOATS FROM CELLULOID, &c.

SPECIFICATION forming part of Letters Patent No. 291,532, dated January 8, 1884.

Application filed November 10, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES P. PITMAN, of Freehold, in the county of Monmouth and State of New Jersey, and HAL ALLAIRE, of Allaire, in the county of Monmouth and State of New Jersey, have made certain new and useful Improvements in the Manufacture of Boats from Celluloid, Coralline, Zylonite, and Similar Substances; and we hereby declare the following to be a full and clear description of the same, reference being had to the accompanying drawings.

In the drawings, Figure 1 is a view showing the first stage of the process of forming the sheet-celluloid on the former or model. Fig. 2 shows the application of the heated formers at the bow. Fig. 3 shows the application of the formers along the body of the boat. Fig. 4 shows the application of the formers at the stem of the boat. Fig. 5 shows the flask or mold in which the boat is placed before removing the model. Fig. 6 shows a portion of Fig. 5. Figs. 7, 8, and 9 show the different-shaped formers used in the process of manufacture, and Fig. 10 shows the manner of heating the formers when hollow ones are used.

The object of our invention is to facilitate the construction of light boats from thin sheets of celluloid and other similar substances; and it consists, principally, in new and improved methods of manipulating the celluloid when in the form of thin sheets, so as to readily construct a boat of any desired length or shape from sheet celluloid, coralline, and similar substances which will have the proper strength and wearing qualities; and our invention also relates to new and improved apparatus used in carrying out such methods of construction.

We are aware that descriptions have heretofore been given for making boats from celluloid by using boards, plates, or sheets of celluloid by placing them over the ribs or skeleton of a boat, to which they are fastened by aid of a paste made of celluloid dissolved in naphtha or spirits of wine, and also by running the celluloid into a matrix, where it is molded into the complete form of a boat; but we have discovered by experiment that these methods are not practicable, owing to the qualities and characteristics of the substances to be employed, as celluloid, zylonite, coral-

line, and like materials require a new and different treatment from any that has yet been devised in order to successfully construct a boat of the proper shape and stability therefrom.

In order to enable those skilled in the art to use our new and improved process of construction, we will proceed to describe it.

We first construct or procure a mold or model of the shape and size of the boat which it is desired to build, which, in the case of what is known as a "racing-shell," would be of the shape shown in Fig. 1 by the letter A, which we term the "body" or "model." This model of the hull may be of wood or paper, if desired, taking for the purpose any boat that has already been made of wood or paper, the outer surface of such boat forming the model of the boat to be constructed. If a wooden or paper mold is used, the outer surface may be first covered with tin-foil or similar substance which will lie closely and evenly over the whole outer surface of the model where the sheet of celluloid, zylonite, or coralline is to be laid. This mold or model A rests on a detached strip or false gunwale, B, which is preferably of wood, extending all around the base of the model, when placed in position for receiving the sheet of material. A sheet of celluloid or similar substance, C, is then laid upon the model, extending its entire length from stem to stern, as shown in Fig. 1, and at the center this sheet is first gradually bent down on each side by a gentle application of heat, if the temperature is low, and it is then tacked or otherwise secured to the false gunwale B. After the sheet of celluloid or similar substance is laid straight on the model A and secured, as shown in Fig. 1, it is pressed gradually down on the model A and bent into shape by means of hollow formers or jackets D D, which are filled with hot water through the openings *a a* from time to time, so as to keep them at the proper temperature, a sheet of muslin or cloth, E, being laid between the former and the material C, the sheet of cloth being slightly moistened with water. This intervening cloth sheet E may or may not be used, but is preferable when the formers are very hot. At the extreme ends, which will constitute the stem and stern of the boat, the loose formers used should

be of a shape to correspond with the model of the boat being made, such as appear in D'' and D''', and at the stem and stern the sheet of material C may be pulled and pressed with the heated formers, so as to be formed into shape without any cutting or trimming. If desired, the stem and stern may be finished with metal tips; but the celluloid can be made to form a perfect bow and stern without any tips.

10 After the sheet of material has been thoroughly pressed down by the heated formers, so as to lie evenly in all parts, and has been tacked or secured to the loose gunwale B, it is left for a time to dry or cool, after which the model A, with the material from which the boat is being made secured to it, is turned right side up and set into a flask or box, G. (Shown in Figs. 5 and 6.) In order that the shell may not lose its shape before the skeleton or frame is placed in it, plaster is at this stage of the manufacture run in the flask or box around the shell before the model A is removed. The same flask may then be afterward used for boats of exactly the same size and shape, and for those of different sizes or shapes the plaster may be cut out and run over again. The sheet of material is then cut evenly all around at the upper edge of the model A, which is then removed, leaving the shell made from the sheet of celluloid or similar substance in the concave mold or flask G, after which the necessary frame-work is placed inside such shell or hull and secured to it by gluing or otherwise; and the cockpit or seating-space of the oarsman is then built in position, the space from the stem and stern to the cockpit being decked over with sheet-celluloid or similar substance, which may be united with the shell at the gunwale by liquid celluloid or other cement. The model A may also be made of metal and heated by means of steam or hot water, so that the sheet of celluloid or similar substance when laid on it will be heated by the model A itself, in which case the formers may be used cold or partially cold.

45 In order to more firmly secure the frame-work

to the shell, a sheet of muslin or similar substance may be first laid on and united with the sheet of material as an inner lining, so that the keelson or gunwales may be more readily glued to such lining.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. As an article of manufacture, a boat made of sheet-celluloid formed into shape on a mold or model, A, by means of heated formers D D, substantially as shown and described.

2. The within-described process of forming the shell or hull of a boat out of a sheet of celluloid or similar substance by means of a mold, A, and heated formers D D, substantially as shown and described.

3. In the construction of boats from sheet-celluloid, the formers or jackets D D, in combination with a mold or model, A, upon which the sheet-celluloid is pressed into shape, substantially as shown and described.

4. In the construction of boats from sheet-celluloid, the combination of the concave mold D and mold A, having a loose gunwale, B, substantially as and for the purposes shown and described.

5. In the construction of boats from sheet-celluloid, the model A, made of metal, and false gunwale B, of wood, for the reception and retention of the sheet of celluloid when pressed into shape by formers D D, substantially as shown and described.

6. A boat or racing-shell with a hull composed of sheet-celluloid or similar substance, formed into shape over a paper or wooden boat already made, whereby the exact shape and proportions of such wooden or paper boat may be obtained in celluloid, substantially in the manner and by the means herein shown and described.

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