

PUBLISHED
MAY 11, 1943.
BY A. P. C.

E. BUGATTI ET AL
CONSTRUCTION OF HOLLOW BODIES SUCH
AS AIRCRAFT ELEMENTS
Filed Aug. 18, 1939

Serial No.
290,908
2 Sheets-Sheet 1

Fig. 1.

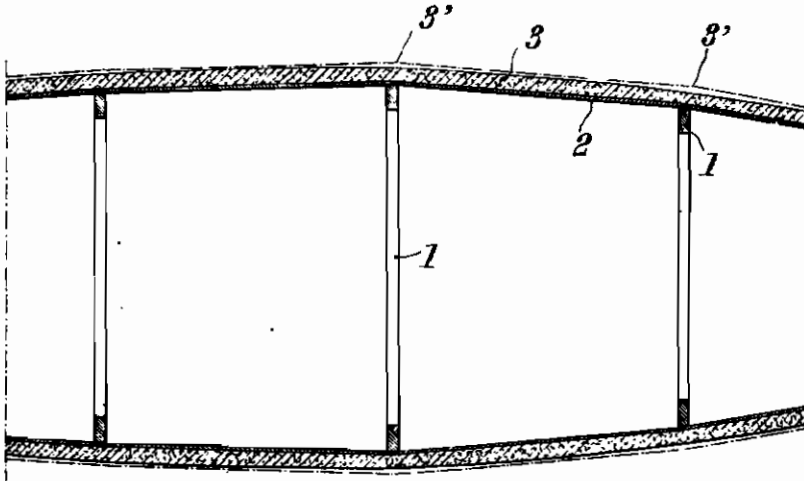
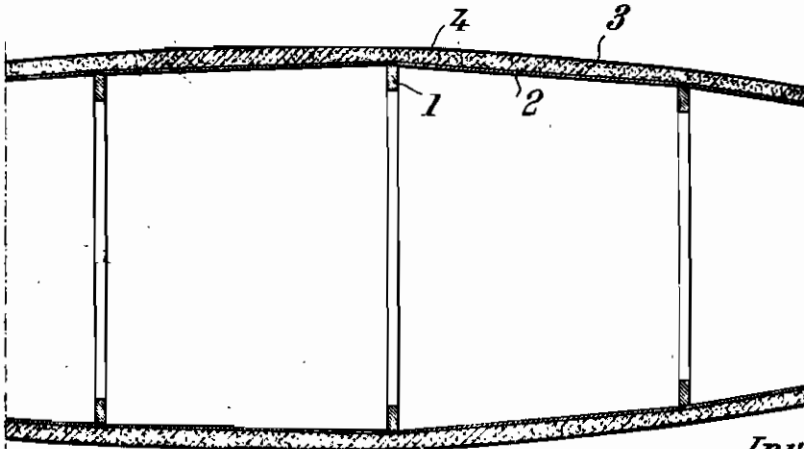


Fig. 2.



Inventor:
Ettore Bugatti,

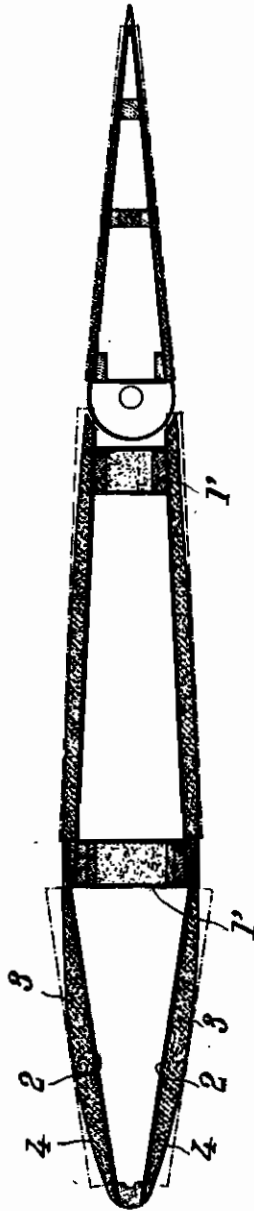
Bailey & Carson
Attorneys

PUBLISHED
MAY 11, 1943.
BY A. P. C.

E. BUGATTI ET AL
CONSTRUCTION OF HOLLOW BODIES SUCH
AS AIRCRAFT ELEMENTS
Filed Aug. 18, 1939

Serial No.
290,908
2 Sheets-Sheet 2

Fig. 3.



Inventor:
Ettore Bugatti,

Barley & Harrison
Attorneys

ALIEN PROPERTY CUSTODIAN

CONSTRUCTION OF HOLLOW BODIES SUCH AS AIRCRAFT ELEMENTS

Ettore Bugatti, Paris, France; vested in the Alien Property Custodian

Application filed August 18, 1939

The present invention relates to the construction of hollow bodies and more especially, although not exclusively, aircraft elements such, for instance, as wings or fuselages.

The chief object of the present invention is to provide a method of construction of said bodies which is better adapted to the requirements of practice than those used up to the present time.

An essential feature of the method according to the present invention consists in fixing to a support which constitutes the frame of the hollow body to be obtained, a layer of a matter which is light, strong, and easy to be worked, such for instance as balsa, which is subsequently carved into the final outer shape said hollow body is to be given.

Other features of the present invention will result from the following detailed description of some specific embodiments thereof.

Preferred embodiments of the present invention will be hereinafter described, with reference to the accompanying drawings, given merely by way of example, and in which:

Fig. 1 is an axial section of a portion of a fuselage made according to the present invention, in an intermediate step of its manufacture;

Fig. 2 shows a further step of the manufacture of said fuselage;

Fig. 3 is a fore-and-aft section of a wing made according to the invention.

It has already been suggested, for the manufacture of structures as above mentioned, to make use of elements of very light weight and of more or less sponge-like consistency, and especially to a wood known as "balsa." But, up to the present time, these materials were given their final shape by molding, which called for an important and costly plant (presses, punchers, and so on).

According to the present invention, I obviate this drawback in the following manner:

The frame, or stress resisting portion of the structure, fuselage for instance, is constituted by a support which is preferably given the shape of a developable surface or an assembly of developable surfaces, such surfaces being relatively easy to make.

I fix on this support a layer of a light material, such for instance as balsa, which is subsequently carved into the final shape to be given to the external wall of the fuselage.

It is possible, for instance, to constitute the support, as shown by the drawing, by fixing, on frames or formers 1, laths or equivalent elements of plywood, the whole forming, between two consecutive formers or frames, a developable surface.

Then, I fix on said support, for instance by gluing, a layer of balsa 3 of a thickness exceeding its desired finished thickness, and this layer is carved from the outside. In other words, I eliminate the portions 3' in excess, for instance by planing, pumicating, etc. The outer surface is thus rectified until its shape corresponds exactly to the desired shape.

I then obtain a fuselage the inner wall of which is constituted by developable surfaces and the external surface of which can be given any predetermined shape. In particular, this external surface may be given the shape of a surface which is not developable, in which case there are generally variations of thickness of the fuselage wall along a generatrix, contrary to what takes place with balsa elements of the same shape obtained by molding.

Finally, this fuselage may be advantageously completed by fixing, for instance by gluing, on the balsa layer 3, a covering 4, consisting, for instance, of a fabric or small laths of thin plywood capable of conforming exactly to the external shape of the balsa layer when said external shape is that of a surface which is not developable.

A structure made according to the present invention is both light and strong and its construction is simple and little expensive.

Of course, I might have recourse to a method as above described for the manufacture of another aircraft element, such for instance as a thick section wing with a flap.

Such a manufacture is illustrated by Fig. 3. In this case, the spars 1' of the wing or of the flap serve to support a substantially flat surface 2 made, for instance of plywood.

This flat surface is then covered with a layer 3 of balsa of a thickness exceeding its final desired thickness, and said layer is carved into the section to be given to the wing.

The whole is covered with a superficial thin covering 4.