

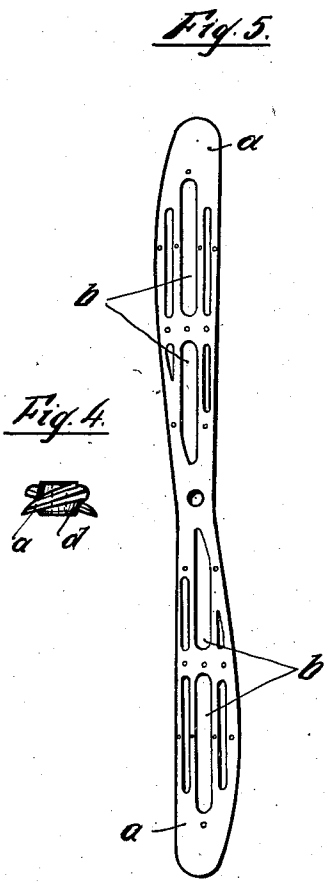
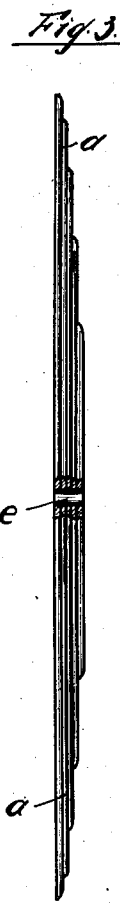
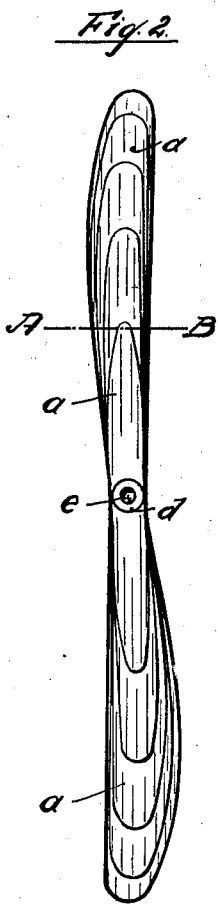
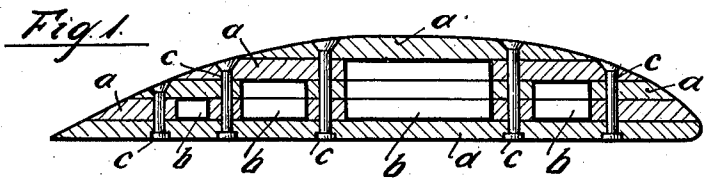
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C. DORNIER

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METAL PROPELLER

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Inventor:
Clausius Dornier
by *[Signature]*
Attorney.

UNITED STATES PATENT OFFICE

CLAUDIUS DORNIER, OF FRIEDRICHSHAFEN-ON-THE-BODENSEE, GERMANY, ASSIGNOR
OF ONE-HALF TO THE FIRM DORNIER-METALLBAUTEN, GESELLSCHAFT MIT
BESCHRÄNKTER HAFTUNG, OF FRIEDRICHSHAFEN-ON-THE-BODENSEE, GERMANY

METAL PROPELLER

Application filed November 3, 1924, Serial No. 747,700, and in Germany November 14, 1923.

My invention relates to propellers for aircraft and the like and more particularly to metal propellers. It is an object of my invention to provide a metal propeller which can easily be manufactured and is highly efficient.

In the metal propellers as hitherto designed consisting of a comparatively thin sheet metal shell braced internally by suitable bracing members the connection of the blades and the hub presents great difficulties. In another type of metal propellers a pair of steel rods extending substantially longitudinally of the propeller served for supporting a plurality of sections making up the propeller blades, but inasmuch as these rods must extend on either side of the hub, the middle portion of the propeller is disproportionate and the aerodynamic conditions of working are unsatisfactory.

The propeller according to the present invention resembles an ordinary wooden propeller in that it is made up of a plurality of sections or laminae corresponding to so many sections taken at right angles to the axis of rotation. These laminae preferably extend over part or the entire length of the propeller and across the hub and are assembled and interconnected by suitable means, such as riveting, screwing, welding or soldering. I prefer employing laminae apertured in proportion to the stresses to which the several parts of each lamina are exposed, whereby the total weight of the propeller can be materially reduced. The assembled laminae can be distorted so as to adapt themselves to the pitch of the blades. By employing laminae consisting of different metals having different strength and specific weight the relation between the centrifugal forces acting on the propeller and the cross-sections corresponding to these forces can be influenced within wide limits.

In the drawings affixed to this specification and forming part thereof, a metal propeller embodying my invention is illustrated diagrammatically by way of example. In the drawings.

Fig. 1 is a cross-section, drawn to a large scale,

Figs. 2 and 3 are a plan view and a side elevation, partly in section, and

Fig. 4 a side elevation at right angles thereto, drawn to a smaller scale.

Fig. 5 is a plan view showing an apertured lamina.

Referring more particularly to Figs. 1 and 5, the uppermost and lowermost of the laminae *a*, *a* are plain sheet metal shapes. The inner laminae are cut out in accordance with the different stresses acting on the different parts of the propeller, apertures *b*, *b* being formed. Rivets or screw bolts *c*, *c* serve for firmly uniting the several laminae. *d* is the hub, *e* is the boring for the end of the propeller shaft.

As shown more particularly in Fig. 3, the circumferential edges of the laminae need not be shaped so as to strictly adapt themselves to the propeller surface, but may simply be blunt, forming a stepped surface which does not unfavorably influence the aerodynamic efficiency of the propeller.

Obviously the manufacture of a laminated metal propeller is particularly simple, easy and economical. As the laminae extend across the hub, no separate connection is required for the blades and in view of the great tensile strength of the metal the hub can be kept very small, in contradistinction to the large hubs of wooden propellers.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:—

1. An all-metal propeller comprising a plurality of superposed and united sheet metal laminae, an inner lamina being apertured to form a closed cavity.

2. An all-metal propeller comprising a hub, a plurality of superposed and united sheet metal laminae, extending across said hub substantially at right angles to the hub axis, said laminae being so twisted about their longitudinal axes that their two halves extend in different planes.

In testimony whereof I affix my signature.

CLAUDIUS DORNIER.