G. AND U. ANTONI.

FLYING MACHINE.

APPLICATION FILED APR. 24, 1915.

1,317,413.

Patented Sept. 30, 1919.

2 SHEETS—SHEET 1.

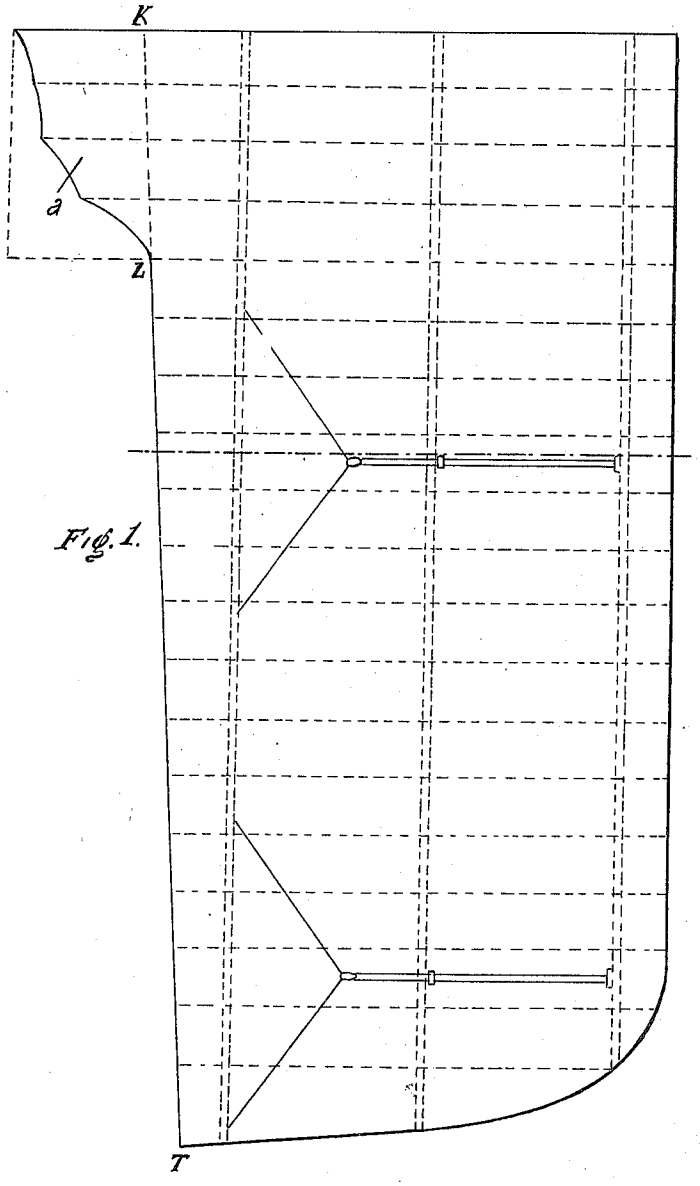


Fig. 1.

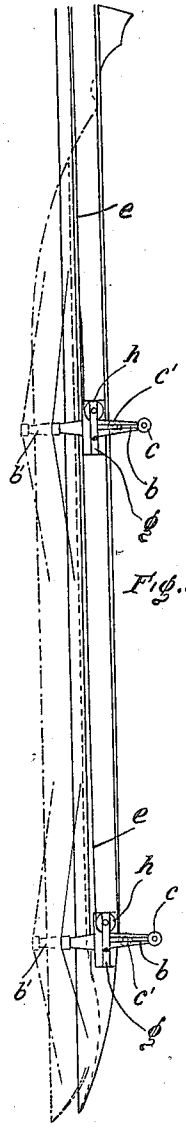


Fig. 2.

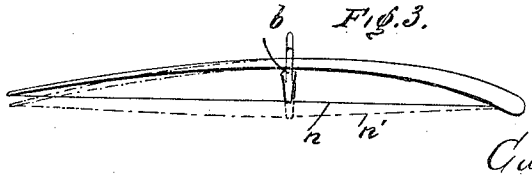


Fig. 3.

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THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

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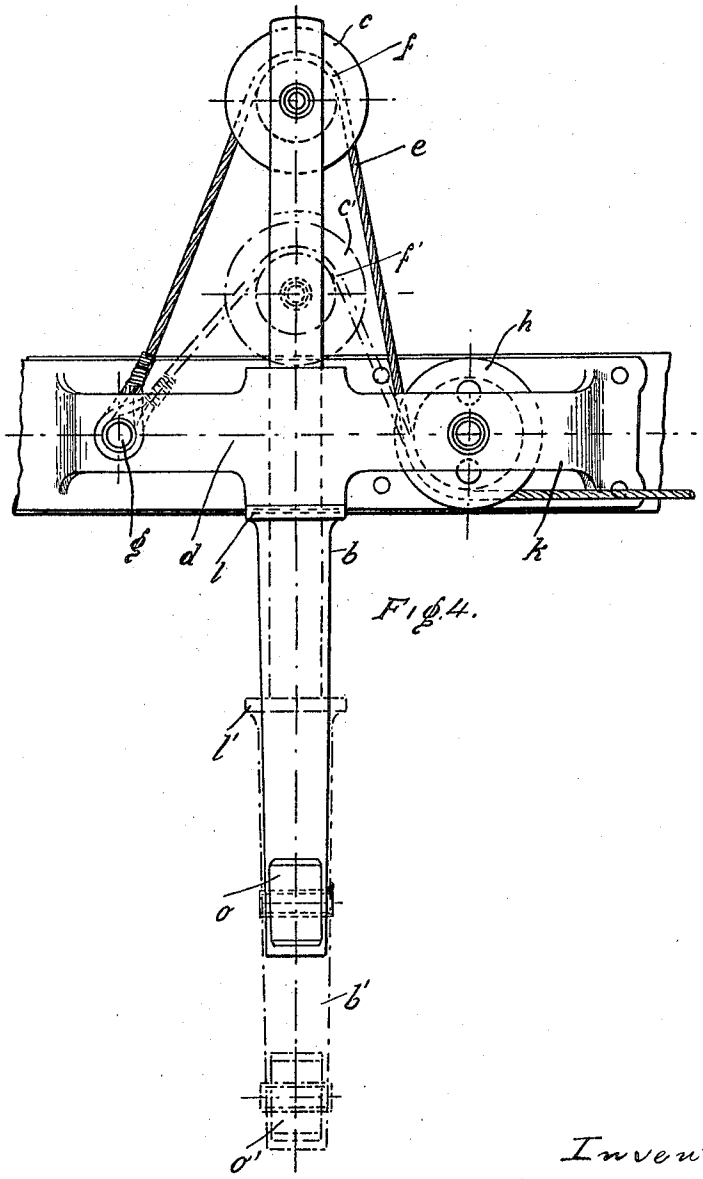


Fig. 4.

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UNITED STATES PATENT OFFICE.

GUIDO ANTONI AND UGO ANTONI, OF PISA, ITALY.

FLYING-MACHINE.

1,317,413. Specification of Letters Patent. Patented Sept. 30, 1919.

Application filed April 24, 1915. Serial No. 23,649.

To all whom it may concern:

Be it known that we, GUIDO ANTONI and UGO ANTONI, subjects of the King of Italy, residents of Pisa, in the Kingdom of Italy, 1 Via Cappuccini, have invented new and useful Improvements in Flying-Machines, of which the following is a specification.

The object of the present invention is an improved supporting wing for flying machines, which is so constructed as to enable the carrying surface to be increased without, however, increasing the wing span, such construction also serving to improve the action of the wing during gliding, when the motor is stopped, in consequence of the greater facility with which the rear central portion of the wing can be warped upward. Finally the improved construction enables the varying of the wing curvature to be more readily and more efficiently controlled.

The accompanying drawing shows one embodiment of the invention:

Figure 1 is a fragmental plan view of the improved wing;

Fig. 2 is a front view, and

Fig. 3 is an end view of the wing shown in Fig. 1; and

Fig. 4 is a detail of the arrangement of the rope suspension for controlling the curvature of the warpable rear portion of the wing.

At its rear central portion, near the fuselage, the wing is provided with an extension —*a*— of any desired form, which, by projecting beyond the edge line K L T of the wing, serves to increase the carrying surface of the latter, as well as to facilitate the upward warping of its said rear central portion.

The supporting rod —*b*— which carries the pulley —*c*— is designed to be shifted from its upper position to a lower position represented in dotted lines in Fig. 4, and indicated in said figure by the reference letter —*b'*—, for which purpose said rod is slidably mounted in an opening or passage formed in the guide —*d*—. This shifting of the rod is effected by the rope —*e*—, which is fastened at one end to the fixed point —*g*—, and led first upwardly over the pulley —*c*—, in whose groove —*f*— it fits, and then downwardly under a grooved pulley —*h*— which is mounted in a bracket —*k*—, fixed to the transverse middle frame beam of the wing, the other end of said rope being connected to the controlling wheel. There may be one, or more than one for each wing; in Fig. 2, two of them are shown.

The supporting rod —*b*— is fitted with a shoulder —*l*—, and when this shoulder —*l*— is held in the position shown in full lines in Fig. 4, that is to say, in contact with the lower edge of the guide sleeve —*d*—, the wing has its minimum curvature. On the other hand, when the pulley —*c*— is moved into its lower position —*c'*—, and said shoulder is lowered into position —*l'*—, the wing will have its maximum curvature. In this way, the camber of the wings may be varied by pulling in all the cords *e* simultaneously, and lateral control may be obtained by a controller having a differential action.

The rod —*b*— is suitably connected with the wires or ropes —*n*—, so as to subject the wing to the action thereof; and these wires, owing to the lowering of the sliding pulley from one position to the other, are likewise flexed downwardly into position —*n'*—. This results in the warping of the wing at its rear flexible portion, the effect of such warping being increased by the warping of the extension —*a*—. The shifting of pulley —*o*— to its lower position allows the wires —*n*— to slide, and thus prevents the supporting rod —*b*— from being deviated from the vertical direction.

We claim as our invention:—

1. In an aeroplane, the combination of a wing having its rear central portion provided with a flexible extension which projects rearwardly beyond the edge of said portion and is adapted to be warped with said portion so as to change the curvature of the entire flexible portion of the wing; tensioning or warping wires for said wing; and a warping device comprising a vertically sliding rod connected with said wires, a pulley carried by said rod to move therewith, a guide for said rod, a fixed pulley permanently disposed below and to one side of the first-named pulley, and a rope for depressing said rod fixed at one end and led over said first-named pulley and under the second-named pulley.

2. In an aeroplane, the combination, with a wing, and tensioning or warping wires connected thereto; of a device for warping said wing, comprising a vertically-slidable rod connected with said wires, a pulley carried by said rod to move therewith, a guide

for said rod, a fixed pulley permanently disposed below and to one side of the first-named pulley, and a rope for depressing said rod fixed at one end and led over said first-named pulley and under the second-named pulley.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

GUIDO ANTONI.
UGO ANTONI.

Witnesses:
FRANCISCO INATZ,
LEON BÖHUS DE SAUVANNE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."