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E. J. E. DEWOITINE
AEROPLANES AND HYDROPLANES
HAVING FOLDING WINGS
Filed March 9, 1940

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323,201
3 Sheets-Sheet 1

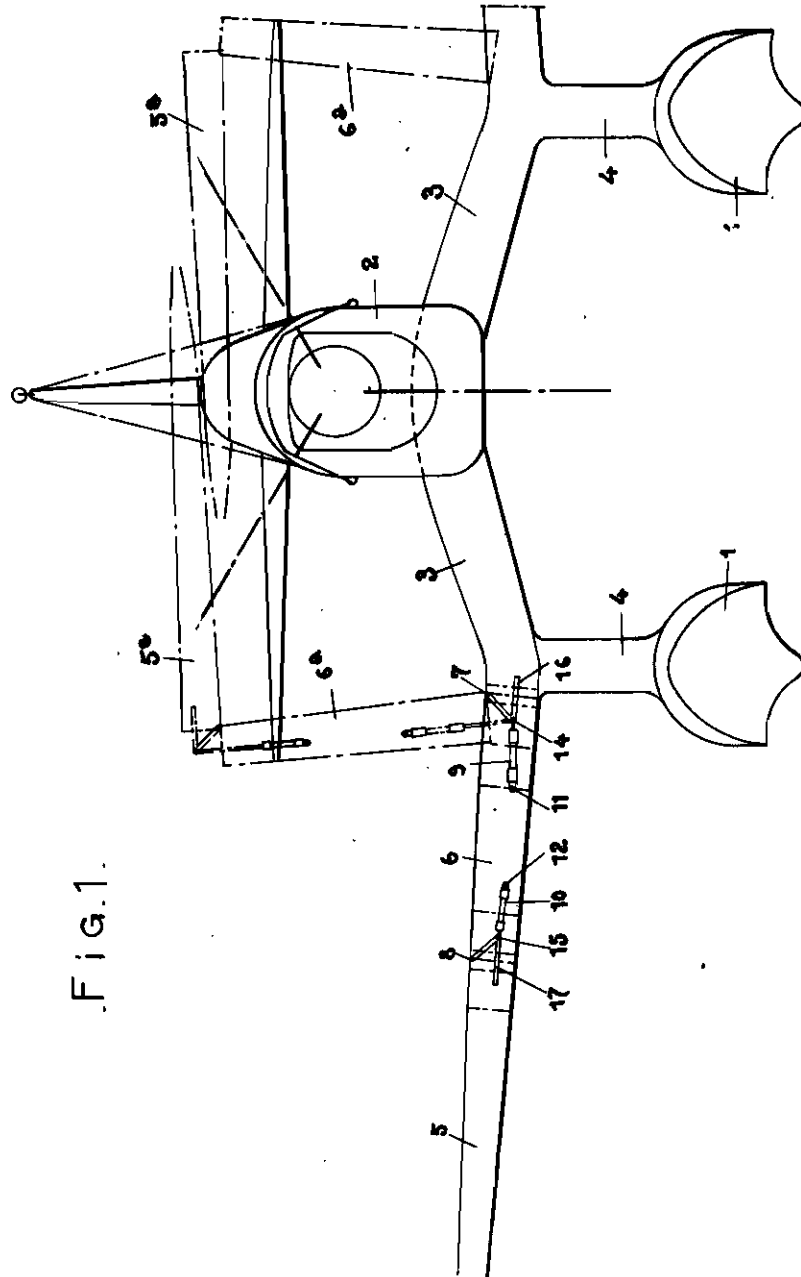


Fig. 1.

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FIG. 2.

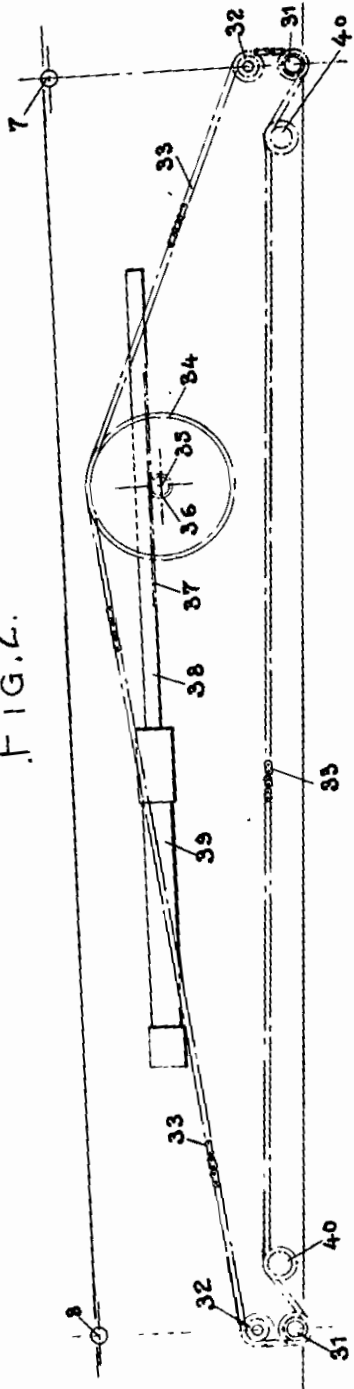
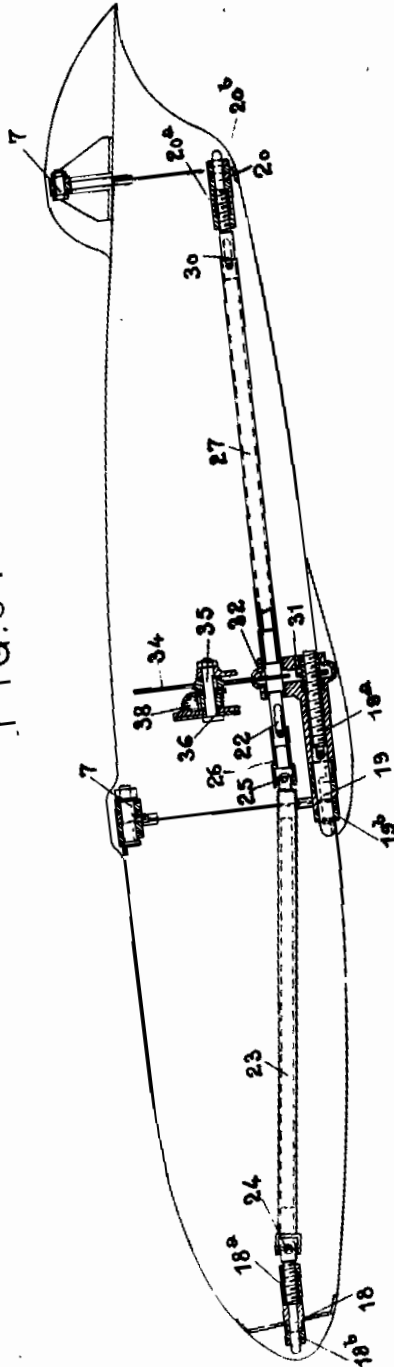


FIG. 3.



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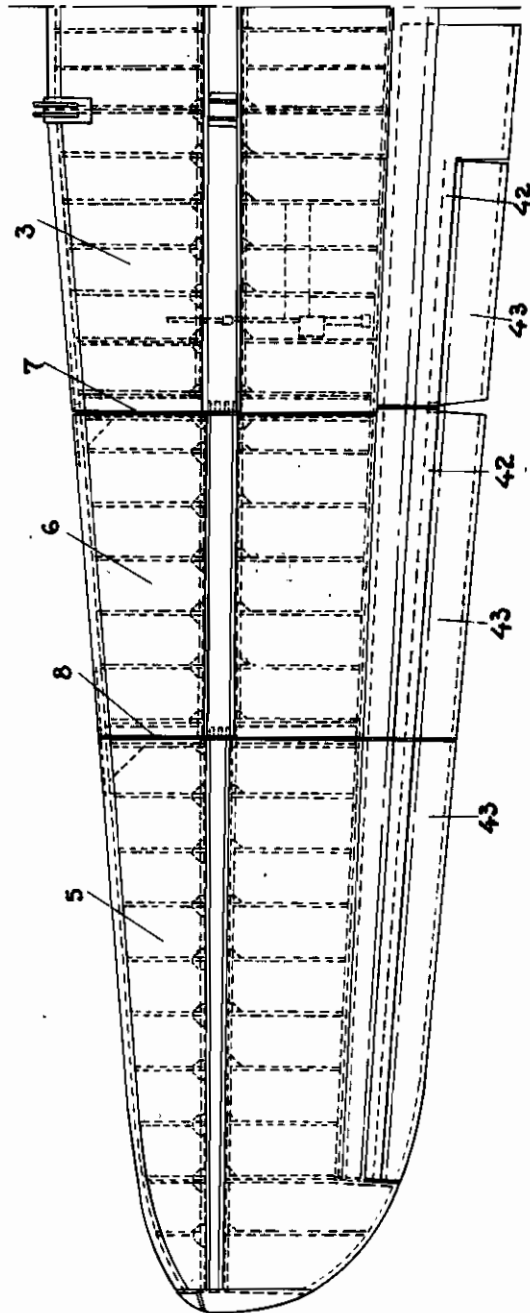
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Fig. 4.



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ALIEN PROPERTY CUSTODIAN

AEROPLANES AND HYDROPLANES HAVING FOLDING WINGS

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Application filed March 9, 1940

The present invention has for object improvements in aeroplanes or hydroplanes having folding wings and is mainly characterised by the fact that the end part of each wing is pivoted on at least one intermediate part which, in its turn, is pivoted on the fixed part of the wing or on the hull or fuselage; the pivotal joints extend according to the depth of the wing and are combined, on the one hand, with locking means and, on the other hand, with devices for operating the pivoted parts.

The locking and operating means, which can be of any type whatever, are controlled at a distance and in particular from the pilot's seat.

In an embodiment, the locking and unlocking means are constituted by bolts of the screw and nut type, simultaneously controlled by a pneumatic or hydraulic jack or other equivalent systems controlled at a distance.

The means for moving the pivoted parts of the wing, when the locking means are put out of action, are constituted by pivoted arms also controlled by pneumatic or hydraulic jacks or other equivalent devices controlled at a distance.

The invention also extends to other particular points which will appear in the following text given with reference to the accompanying drawings, by way of example only, in which:

Fig. 1 is a partial front view of a hydroplane having folding wings devised according to the invention.

Fig. 2 is a diagram of the locking and unlocking control in the median or intermediate part of the wing.

Fig. 3 is a diagram of the locking device in a transverse plane extending according to the depth of the wing and in the vicinity of a pivotal joint.

Fig. 4 is a plan view of a wing structure.

The hydroplane, illustrated by way of example only, comprises two floats 1, a hull or fuselage 2 and wings the roots 3 of which, extending from the hull 2 to the attaching members or stay-rods 4 of the floats 1, are fixed, the other parts of the wing being pivotally mounted.

According to an important feature of the present invention, the pivoted parts of the wing comprise the ends 5 and the intermediate parts 6. In the example illustrated, each wing comprises a single part 6, but a plurality of intermediate parts 6 might be provided without departing from the scope of the invention.

For each wing, the intermediate part 6 is pivoted at 7, on the fixed part of the wing and the end 5 is pivoted at 8, on the intermediate ele-

ment 6. The pivotal joints 7 and 8 are arranged on the dorsal part of the wing and even above the latter in the region extending towards the leading edge, as particularly shown in Fig. 3.

In the intermediate part 6 are arranged two jacks 8 and 10 respectively pivoted at 11 and 12 and the rods of which are, in their turn, pivoted at 14 and 15 on ferrules 16 and 17. These jacks can be of any type whatever, but it appears advantageous to use pneumatic or hydraulic jacks the distant control of which can be ensured through the medium of very simple means. Preferably, said jacks are controlled from the pilot's seat. The jacks 10 and 8 are successively or simultaneously controlled so as to bring each wing to the position indicated in dot and dash lines in Fig. 1, the parts 5 and 6 occupying the positions 5^a and 6^a. The ends 5^a partially overlap above the hull 2, in folded position and they are locked by a pin or the like which can be easily put in or out of action from within the hull.

The wings being folded as previously indicated, the cumbersomeness in width of the aeroplane or hydroplane is considerably reduced, this facilitating the putting up and hoisting, particularly in the case of hydroplanes allocated to war-ships.

Figs. 2 and 3 more particularly illustrated a general view of the mechanism for locking and unlocking the pivoted parts of the wing. Each pivoted part comprises three bolts 18, 19 and 20, respectively arranged towards the leading edge, in the central ventral region and towards the trailing edge. Said bolts respectively screw in threaded bores of members 18^a, 18^b and 20^a so as to engage into corresponding keepers 18^b, 19^b and 20^b. The bolts 18 and 20 are connected to a common shaft 22. The connection between the bolt 18 and the shaft 22 is ensured by a shaft 23 mounted as a cardan joint, on the one hand, at 24, on the bolt 18 and, on the other hand, at 25 on a sleeve 26 movable only in translation on the shaft 22. The connection between the bolt 20 and the shaft 22 is ensured by a shaft 27 angularly connected at 30 to the bolt 20 but movable in translation relatively to the latter.

The bolt 19 and the shaft 22 respectively comprise wheels 31 and 32 simultaneously controlled by a chain 33 passing over a driving wheel 34 on the spindle 35 of which is rigidly secured a toothed wheel 36 meshing with a rack 37 cut in the rod 38 of a jack 39. As will be more particularly seen in Fig. 2, the chain 33, which is guided at 40, simultaneously passes over two series of wheels 31—32 so as to simultaneously con-

trol both series of bolts ensuring the locking of the pivoted parts 5 and 6 of the wing. The jack 39 is preferably of the pneumatic or hydraulic type and it is controlled at a distance, in particular from the pilot's seat.

Fig. 4 is a plan view of the wing. The curvature flaps 42 and the warping ailerons 43 are sectioned according to the pivotal joints 7 and 8.

It is obvious that the embodiment described and illustrated is given herein only by way of indication and not in a limiting sense. All modifications or changes which do not alter in any way the main features above set forth or the desired result, remain included in the scope of the present invention.

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