March 21, 1939. W. L. BARCLAY 2,151,004

RETRACTABLE WATER PROPELLER FOR AIRSHIPS

Filed April 5, 1938 2 Sheets-Sheet 1

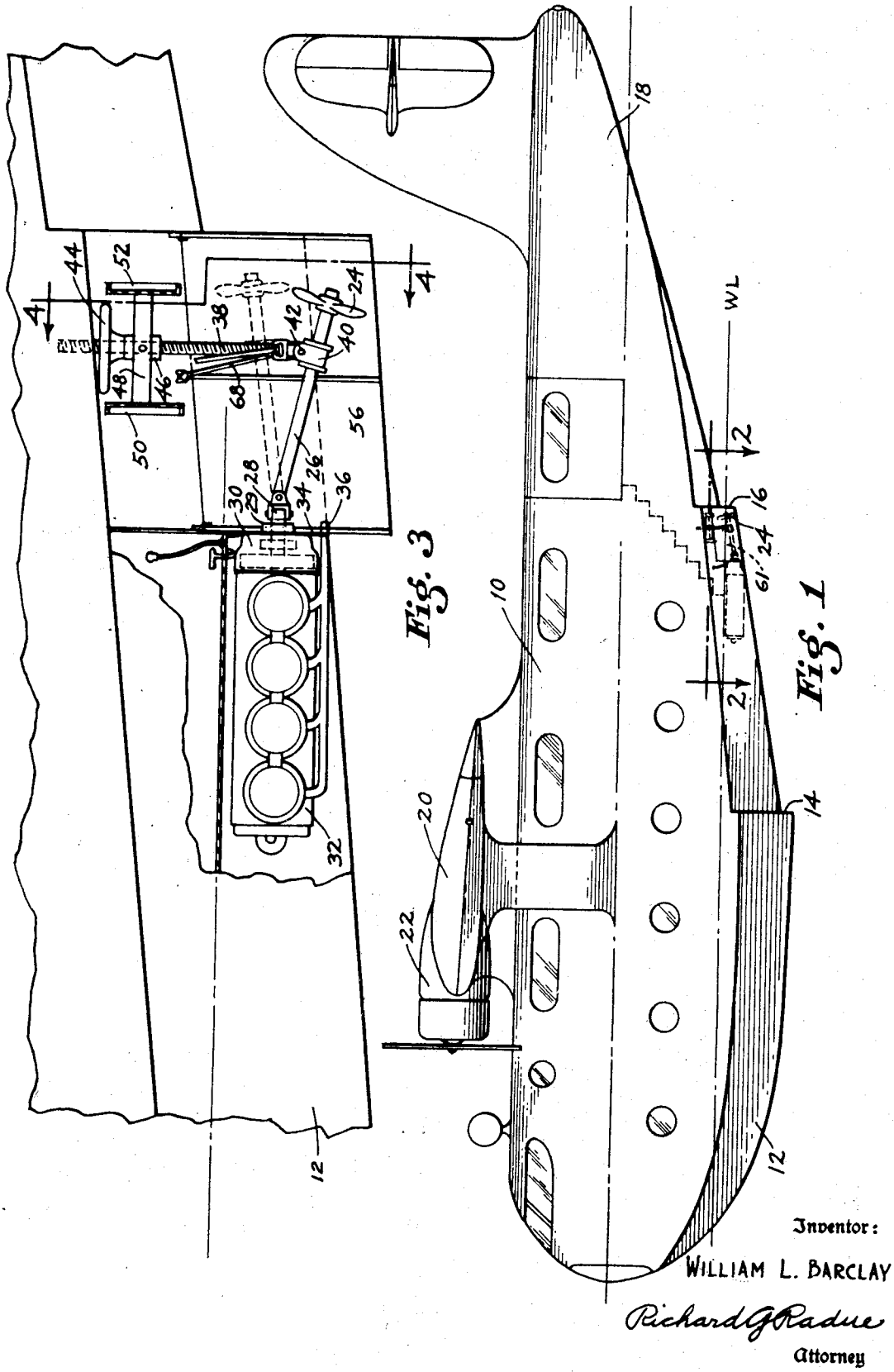


Fig. 3

Fig. 1

Inventor:
WILLIAM L. BARCLAY
Richard G. Radue
Attorney

March 21, 1939. W. L. BARCLAY 2,151,004

RETRACTABLE WATER PROPELLER FOR AIRSHIPS

Filed April 5, 1938 2 Sheets-Sheet 2

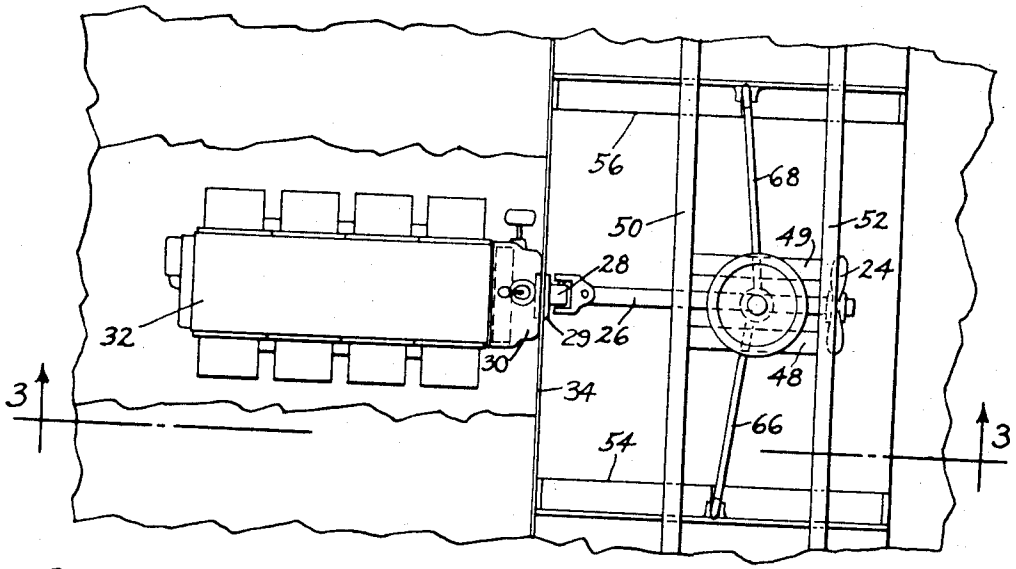


Fig. 2

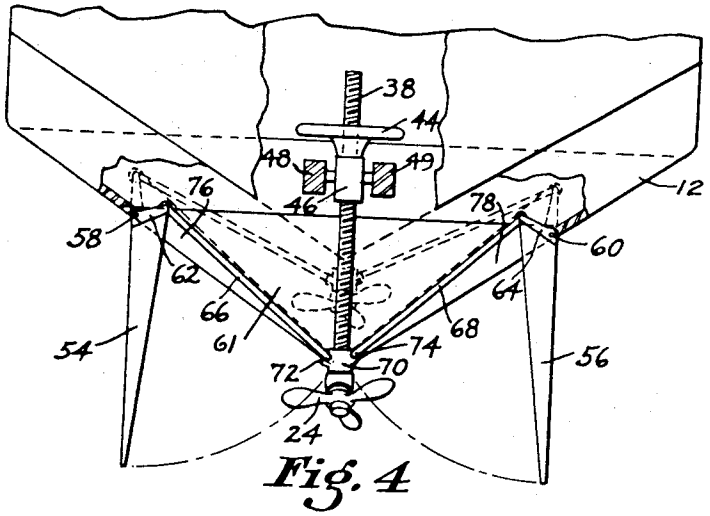


Fig. 4

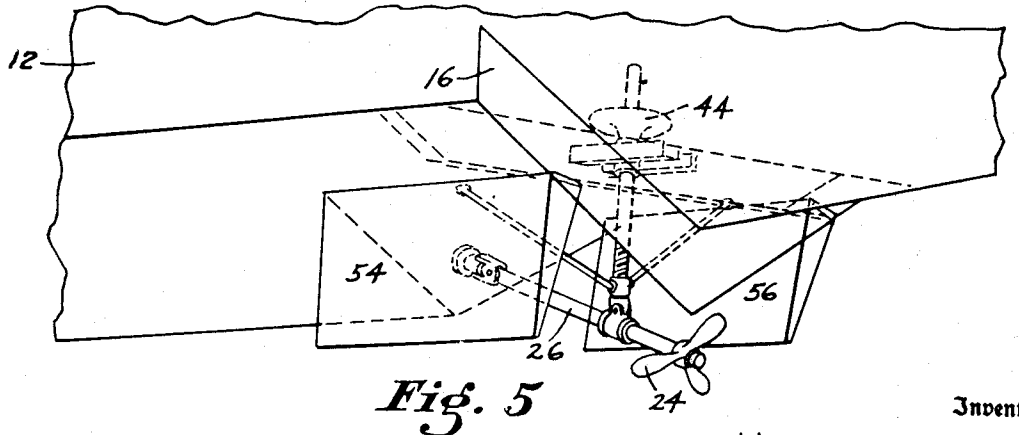


Fig. 5

Inventor:
WILLIAM L. BARCLAY
Richard G Radue
Attorney

Patented Mar. 21, 1939

2,151,004

UNITED STATES PATENT OFFICE

2,151,004

RETRACTABLE WATER PROPELLER FOR AIRSHIPS

William L. Barclay, Arlington, Va.

Application April 5, 1938, Serial No. 200,255

8 Claims. (Cl. 244—50)

This invention pertains to hydroplanes and is concerned most directly with flying ships or seaplanes.

To facilitate efficient and economical navigation of seaplanes upon the surface of water, it has been proposed that the hull of such a plane be provided with an auxiliary or water propeller which may be retracted into the hull when not in use.

But this progress has not fully solved the problem of surface navigation of seaplanes. Efficient marine navigation requires the use of a keel or center-board to increase the lateral resistance of the hull. This need is particularly great because of the inherent nature of hydroplanes.

A corollary requirement is that the keel or stabilizing means must not detract from the streamline efficiency of the hull in taking off, landing or in the air.

It might be said, therefore, that the practical solution of the problem outlined above is the essence of the objects of the present invention.

A principal object of the invention is to provide the hull of a seaplane with a retractable water propeller and retractable keel or stabilizing means.

Among the other important purposes of this invention is the provision of means for retracting the propeller and stabilizing means at the same time.

Another major provision of this invention is the use of the stabilizing means to complete the housing for the retracted propeller, and in so doing to preserve the streamline design of a hydroplane hull.

In addition to these, other objects which the invention comprehends will appear from the ensuing specification which covers a preferred form of the invention.

Reference will now be made to the drawings in which like characters of reference designate similar parts.

Fig. 1 is a side elevation of a present day flying ship;

Fig. 2 represents a fragmentary plan view of the application of the invention thereto, and is taken on the plane indicated in Fig. 1 as 2—2;

Fig. 3 is an elevation partly in section on the plane 3—3 of Fig. 2;

Fig. 4 shows a transverse section on line 4—4 of Fig. 3; and

Fig. 5 is a perspective view of a hull bottom showing the relation of parts when the propeller is extended.

A flying ship with a hull 10 having a hydroplane bottom 12 with successive steps 14 and 16 is illustrated in Fig. 1. The hull 10 tapers rearwardly from the steps 14 and 16 to a tail portion 18. The ship generally is completed by wings such as 20 and air-propelling motors like 22.

In the lower section of the hull 10, within that portion of the bottom 12 which is rearward of the first step 14 and forward of the second step 16, is located a retractable water propeller 24. As shown in Fig. 3, the propeller 24 is made fast to the end of a shaft 26 connected by a universal joint 28 to a tailshaft 29 extending from a conventional change speed mechanism or transmission 30. The transmission 30 is provided with reversing gear.

A prime mover 32, which is shown as an internal combustion engine, drives the propeller shaft 26 through the transmission 30, separated from said shaft by a watertight bulkhead 34. Extending through the bulkhead 34, and arranged to discharge below the waterline WL of Fig. 1 is an exhaust pipe 36.

To raise and lower the propeller shaft 26, there is provided a large screw 38 having a sliding shaft bearing 40 pivoted to its lower end by a pin 42. As the screw 38 is moved vertically, the bearing 40 will pivot on the pin 42 and slide along the propeller shaft 26 so as to adjust itself to the swinging movement of said shaft about its joint 28.

By way of illustration, an internally-threaded hand wheel 44 is utilized to control the movement of the screw 38. This hand wheel is supported from beneath by a collar 46 sustained in trunnion fashion by a pair of longitudinally extending bars 48 and 49 joined at their ends to a pair of transversely extending channel members 50 and 52 carried by the hull 10 (Fig. 2). It will be observed in Fig. 3 that the screw 38 passes through the collar 46 and hand wheel 44.

Figs. 4 and 5 will now be referred to for an explanation of the arrangement of a pair of keel-like stabilizing members 54 and 56. The members in question (54 and 56) are hinged at 58 and 60 respectively to the hull bottom 12 so as to depend vertically and longitudinally therefrom when the propeller 24 is in extended position, or to swing together like a pair of doors when said propeller is completely retracted.

With the bulkhead 34 and step 16 the stabilizing members 54 and 56 provide a compartment or housing 61 for the propeller 24 and its shaft 26. In so doing they preserve the fair or streamline contour of the hull bottom 12 at this section. In the presently illustrated embodiment, the mem-

bers 54 and 56 are generally rectangular in side elevation; they will be suitably reinforced and may have the tapering or wedge-shaped cross-section which the drawings show. It is preferred to place them inboard of the bottom 12 and parallel, with the propeller shaft 26 extending midway therebetween (Fig. 4).

Approximately in the middle of the length of the upper edges of the stabilizers 54 and 56, inwardly extending lever arms 62 and 64, respectively, are firmly attached at an angle such that they are substantially vertical when said stabilizers are in closed position; Fig. 4 shows this relationship in dotted lines.

A pair of operating links or rods 66 and 68 are connected pivotally to the free ends of levers 62 and 64, respectively. Immediately above the pin connection 42 of screw 38 and shaft bearing 40, an additional collar or sleeve 70 encircles said screw. By means of diametrically opposed connections 72 and 74, the operating rods 66 and 68 are joined to the sleeve 70. The connections at both ends of the rods 66 and 68 are pivotal and of a nature to permit limited universal movement.

In this fashion the vertical movement of the screw 38 in response to turning of the screw wheel 44 is employed for the double purpose of extending and retracting the propeller shaft 26 and opening and closing the housing 61 therefor as represented by the stabilizing members 54 and 56. A single operating means co-ordinates the actuation of the propeller shaft 26 and stabilizing means 54, 56.

When the shaft 26 is in its normal extended position, as in Fig. 4, the angle between the rods 66 and 68 will be small enough effectively to prevent any rising of the sleeve 70 due to side thrust on the stabilizing members 54 and 56.

In Fig. 4, the numerals 76 and 78 refer to the forward portions of the hull bottom 12 which mate with the forward edges of stabilizers 54 and 56 to form the closed compartment or propeller housing 61 which preserves the streamline of the bottom 12. The rear edges of these stabilizing members 54 and 56 similarly fit the hull when the compartment 61 is closed on the retracted propeller.

Those skilled in this art will recognize the independent utility of the stabilizing means which this invention provides.

While the preferred embodiment of this invention has been shown and described, it will be understood that various modifications can be made in the details thereof without departing from the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a hydroplane, a propeller retractable within the hull of said hydroplane, stabilizing means forming part of the bottom of said hull and connected thereto for relative movement into and out of stabilizing position, and means for extending the propeller and for moving the stabilizing means into operative position, said stabilizing means being of sufficient extent to close the bottom of the hull adjacent the propeller and arranged to do so when in inoperative position.

2. In a flying ship having a hull with a hydroplane bottom, a water propeller retractable within the bottom of said hull, a pair of stabilizing members connected to said hull on opposite sides of the propeller for relative movement with respect thereto into and out of stabilizing position, and means for concurrently extending the propeller and moving the stabilizing members into operative position, said stabilizing members being arranged completely to close the bottom of the hull adjacent the propeller when the latter is retracted.

3. In an airship having a hull for marine navigation, a downwardly opening compartment in the bottom of the hull, a propeller shaft and a propeller retractable within said hull, a keel-like stabilizing member hingedly connected to the bottom of said hull adjacent the compartment for transverse swinging movement with respect thereto, and means for moving the propeller shaft and stabilizing member relatively to each other and in synchronism to close the compartment when the shaft and propeller are retracted and extend the keel-like stabilizing member downwardly from the hull when the propeller and its shaft are protracted.

4. In an airship having a hull for marine navigation, a propeller shaft, a propeller secured to one end thereof, a prime mover having speed changing means associated therewith, connections which include a universal joint between the prime mover and the other end of the propeller shaft, a compartment in the hull for said shaft and propeller, means for moving the propeller shaft from a retracted position within the hull to an operative position below said hull, stabilizing means connected to said hull for swinging movement with respect thereto adjacent the propeller shaft, and means for moving the propeller shaft and stabilizing means into and out of operative position, said stabilizing means when in inoperative position lying below the retracted propeller shaft so as to close the compartment and form a streamline continuation of the bottom of said hull.

5. In an airship having a hull for marine navigation, a downwardly opening compartment in said hull, a propeller retractable in said compartment, a pair of rectangular, keel-like stabilizing members hinged to the bottom of said hull on opposite sides of its longitudinal center line to extend longitudinally thereof adjacent the compartment, and means for moving said stabilizing members into vertical position depending from the hull and for swinging them together so that their free or lower longitudinal edges coincide and the outer lateral surfaces of the members thereby form a fair continuation of the bottom of the hull and close said compartment.

6. In an airship having a hull with a hydroplane bottom, a compartment in said bottom opening downwardly; a keel-like stabilizing member connected to an edge of the bottom opening for swinging movement with respect to the hull, said member extending longitudinally of the hull and vertically downward therefrom when in an operative or stabilizing position; a retractable propeller and propeller shaft mounted within said compartment; and means for extending said propeller and shaft outside the compartment or retracting it therein and for swinging said stabilizing member into an inoperative position in which it underlies the propeller and shaft and forms a closure for the compartment.

7. In a hydroplane having two steps, a propeller located between the steps and retractable within the hull of said hydroplane, stabilizing means forming part of the bottom of said hull and connected thereto for relative movement into and out of stabilizing position, and means for extending the propeller and for moving the stabilizing means into operative position, said stabilizing means being of sufficient extent to close

the bottom of the hull adjacent the propeller and arranged to do so when in inoperative position.

8. In an airship having a hull for marine navigation, said hull being provided with a downwardly opening compartment in its bottom, a propeller retractable through the opening in said hull, means connected to the hull for completely closing the opening of said compartment when the propeller is retracted and stabilizing the airship in the manner of a keel when the propelier is protracted, and actuating means for moving the first means to a compartment closing position as the propeller is retracted and to a stabilizing position depending from the hull as the propeller is protracted.

WILLIAM L. BARCLAY.