May 8, 1934. H. H. SEMMES 1,957,675

SEAPLANE

Filed Aug. 31, 1931

FIG. 1.

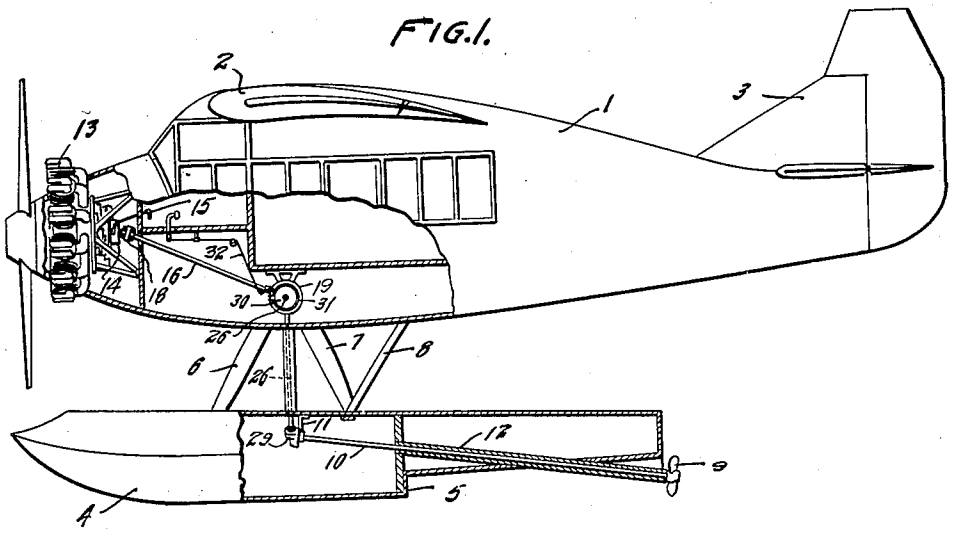


FIG. 2.

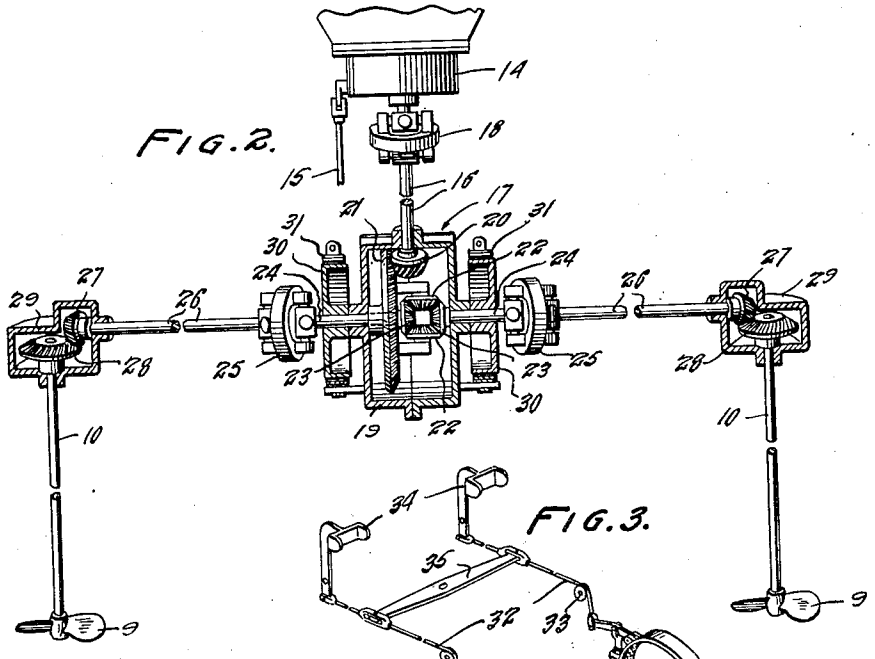


FIG. 3.

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SEAPLANE

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1 Claim. (Cl. 244—2)

This invention relates to seaplanes and more particularly to an auxiliary propelling means for seaplanes.

The seaplanes and flying boats as now employed involve certain disadvantages, particularly in respect to the ability to maneuver, or taxi, while they are upon the surface of the water.

An object of the present invention is to provide an additional propelling means for seaplanes.

A further object is to provide a novel type of steering means for seaplanes and flying boats.

Yet another object is to compensate for the sluggish turning movements of single screw seaplanes.

A further object is to provide a novel means for breaking the water seal as a seaplane is about to take off.

With these and other equally important objects in view, which will appear as the description thereof proceeds, the invention comprehends the concept of providing a seaplane or flying boat with a water engaging propelling means. Preferably, such propelling means consists of a plurality of laterally spaced and independently operated water engaging devices so as to effect turning movements.

In order to more clearly explain the invention, an illustrative physical embodiment of it is disclosed in the accompanying drawing, in which—

Figure 1 is an elevation, partially in section, of a seaplane of the double pontoon type;

Figure 2 is an enlarged detailed view of the propelling mechanism; and

Figure 3 is a detail view of the operating mechanism for securing steering effects.

As shown in the drawing the invention may be embodied in a seaplane having the usual elements of structure including the fuselage 1, sustentation surfaces 2, and empennage 3. Associated with the plane are the twin floats or pontoons 4. These may be of any suitable structure and are preferably of the hollow V-bow type to give a good freeboard. The pontoons are shown with one step 5, but of course it will be understood that any number of steps may be employed.

The pontoons are attached to the fuselage either directly or through the intermediacy of sustaining or lifting surfaces, as when the invention is applied to a biplane. This attaching mechanism may comprise the pontoon struts 6, 7 and 8. These are shown in conventional form but it will be understood that they typify the desired type of attaching structure which is adapted to insure against hogging and sagging effects. Likewise interfloat struts may be employed to minimize racking effect. It is preferable to provide additional bracing means between the floats and the fuselage so as to minimize the stresses caused by the driving of the propelling means and the tortional stresses resulting from the differential operation of the propelling means for steering effects.

When the invention is applied to a twin float or pontoon type of craft, each pontoon may be provided with a marine screw 9. The pontoon is suitably constructed and is rigidified at the points adjacent the propeller. The pontoon itself may be and preferably is constructed of a light weight alloy of low corrodibility and high tensile strength such, for example, as the alloy dural. The propeller 9 is securely mounted upon an elongated shaft 10 supported at one end by the bracket 11 and extending for the greater part of its length through the bearing and protective casing 12, which is securely positioned in the pontoon.

Associated with the main drive shaft of the motor 13 is the clutch 14, controlled by the operating member 15. When the plane is in the air, the parts of the clutch are disengaged. To operate the propellers, member 15 is operated to throw in the clutch, which then transmits power through shaft 16 to the differential 17. It may be necessary to provide a universal joint 18 in shaft 16, to adapt the mechanism to the available space in the plane.

The differential 17 is of any suitable type and in the illustrated form comprises a housing 19 into which shaft 16 extends. A gear 20 at the end of shaft 16 is adapted to mesh with and turn the ring gear 21, upon which are mounted the gears 22. Gears 22 mesh with, and are adapted to turn gears 23, mounted on shaft 24, which extend outwardly from the casing 19.

Each shaft 24 is connected, through a universal joint 25 with a shaft 26, provided at its end with a gear 27. Gears 27 respectively mesh with, and are adapted to drive, gears 28 on the propeller shafts 10. A housing 29 is provided for each gear 27 and the corresponding gear 28.

The power supplied from shaft 16 drives shafts 24 and propellers 9 through the intermediacy of the differential 17. As is customary, the application of a retarding force to one of the shafts 24 will tend to slow it up, while the other shaft 24 will be correspondingly speeded up. By providing means to produce such a retarding force, a differential drive of the propellers and a corresponding steering effect may be secured. To

this end I provide brake drums 30 on the shafts 24. Cooperating with these brake drums are suitable brake bands 31 operated by the cables 32. These cables are led over pulleys 33 to suitable operating means, such as the pedals 34. A tie bar 35 may be provided to support and interconnect the cables 32.

By pressing down on, say, the left pedal 34, the corresponding brake 31 will be applied and the left shaft 24 and propeller 9 will be slowed up while the right propeller will move faster, turning the craft as a whole to the left. Similarly, the craft may be turned to the right by depressing the right pedal. This steering effect may be carried out independently of or conjointly with the operation of the air rudder. Indeed, a suitable control mechanism, similar to that shown in my copending application, Serial No. 466,498 filed July 8, 1930, may be utilized to secure such independent or conjoint operation.

While marine screws have been shown as the propelling mechanism, it is obvious that other types of propelling means, such as paddle wheels, may be used. Differential control of the propelling devices may be secured by other means than by the differential shown, such as providing a clutch to connect each propeller to a central drive shaft. By throwing out one or the other of such clutches, steering effects could be secured.

The invention is equally applicable to flying boats of the central hull type. In applying it to such ships it is merely necessary to mount the propellers 9 on opposite sides of the hull.

The propellers, of course, in addition to the above advantages, provide means for producing an accelerating force well below the center of gravity of the craft, enabling the ship to travel safely over the water at a higher speed than would otherwise be possible. In addition, the propellers are particularly effective to break the water seal as the plane is taking off.

While I have shown and described the preferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth by way of illustration, as it is apparent that many changes and variations may be made therein, by those skilled in the art without departing from the spirit of the invention, or exceeding the scope of the appended claims.

I claim:

In a seaplane, a pair of laterally spaced floats, an air propeller, a motor for driving said air propeller, two marine screw propellers each having a driving shaft extending substantially longitudinally through one of said floats, means including a differential gear for connecting said motor to said marine propellers for driving said propellers, means for varying the speed of one marine propeller relative to the other comprising a pair of brakes associated with said connecting means, and a pair of pedals one connected with each of said brakes.

HARRY H. SEMMES.