

Dec. 12, 1944.

W. R. GLEN

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PNEUMATIC FLOTATION AND ANTIDRAG SYSTEM

Filed Nov. 3, 1942

2 Sheets-Sheet 1

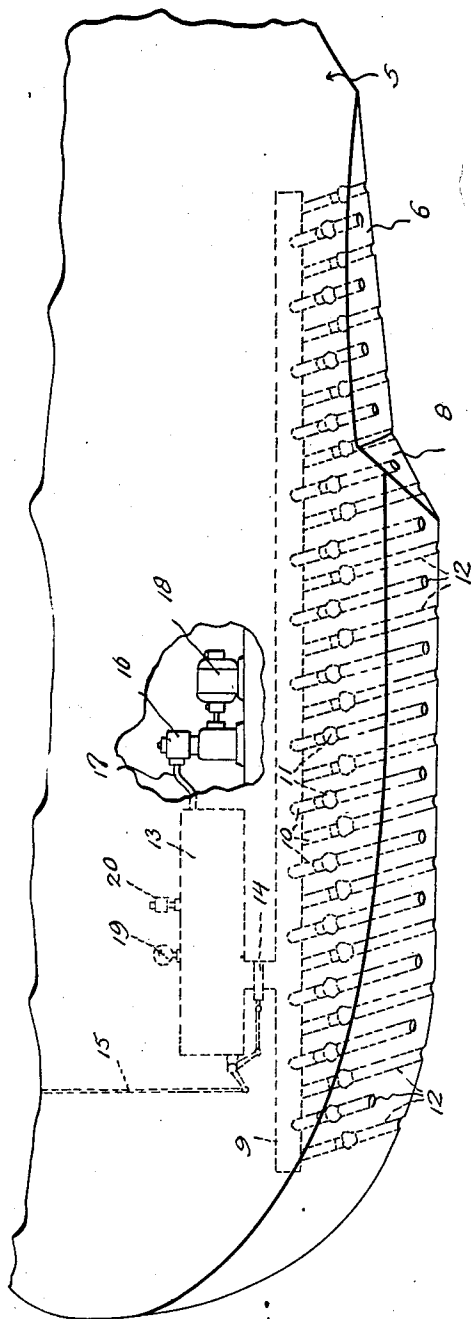
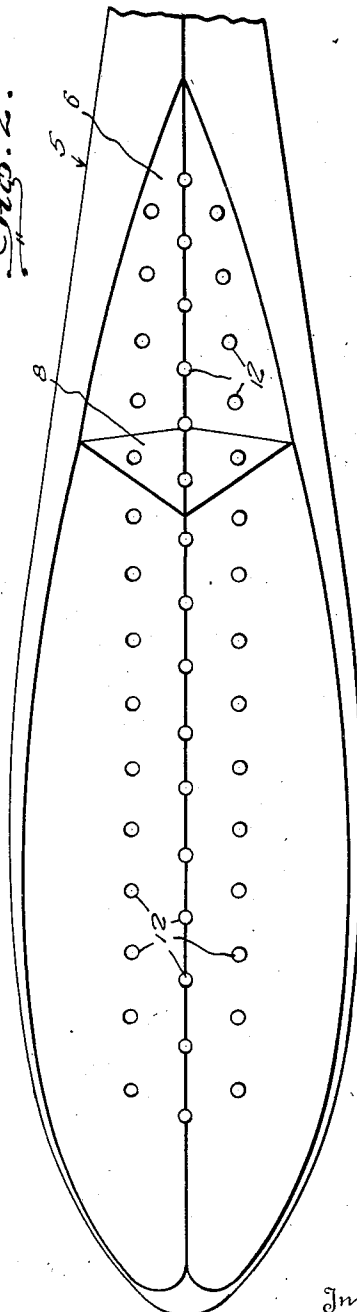


Fig. 1.

Fig. 2.



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Fig. 4.

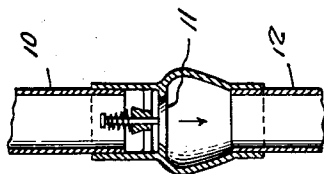


Fig. 5.

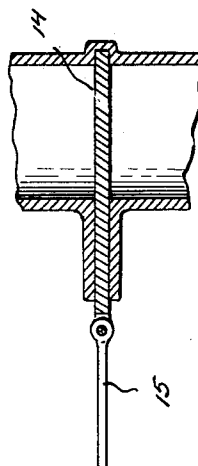
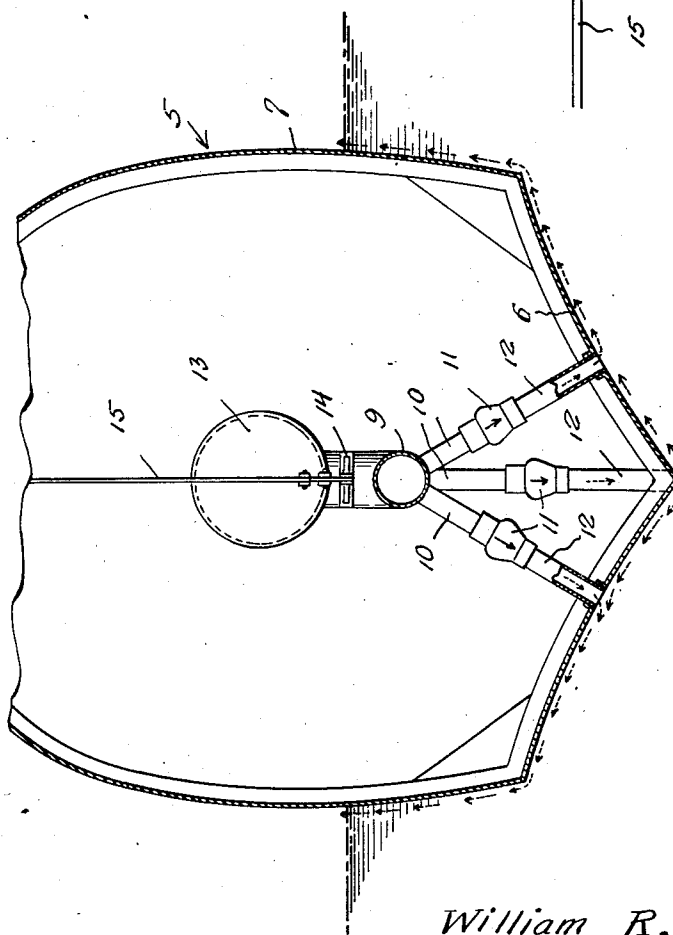


Fig. 3.



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UNITED STATES PATENT OFFICE

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PNEUMATIC FLOTATION AND ANTIDRAG
SYSTEMWilliam R. Glen, Vancouver, British Columbia,
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Application November 3, 1942, Serial No. 464,413

1 Claim. (Cl. 244—105)

This invention relates to a pneumatic flotation and antidrag system for seaplanes and other types of flying devices which employ bodies of water in taking off and landing.

The primary object of this invention is the provision of means for shortening the distance of travel of the device in water when taking off and thereby reduce to a minimum one of the most hazardous periods in the operation of the device by providing a vertical lifting effect on the hull of the device, also reducing to a minimum water resistance to the movement of the hull.

Another object of this invention is the provision of a pneumatic cushioning effect for absorbing shock to the hull when landing or coming in contact with the water and thus permit landing of greater weights with an increased margin of safety.

With these and other objects in view as will become more apparent as the description proceeds, the invention consists in certain novel features of construction, combination and arrangement of parts which will be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a fragmentary side elevation illustrating a portion of a hull of a seaplane or similar flying device and showing the hull equipped with my invention.

Figure 2 is a fragmentary bottom plan view illustrating the hull with the air jets projecting through the bottom thereof.

Figure 3 is a fragmentary transverse sectional view showing the application of the present invention to the hull.

Figure 4 is a fragmentary vertical sectional view illustrating one of the check valves employed in connection with the invention.

Figure 5 is a fragmentary vertical sectional view illustrating a control valve.

Referring in detail to the drawings, the numeral 5 indicates a fragmentary portion of a hull of a seaplane or similar flying device. The hull 5 includes a bottom 6 and sides 7, the bottom 6 having a stepped formation, as shown at 8. It is well known that a hull of a seaplane or similar flying device requires considerable driving power to be expended for causing the hull to rise upwardly out of the water when the seaplane or similar device takes off from the water resulting in the seaplane having to travel for a considerable distance in and on the water before

the actual takeoff occurs therefrom, resulting in one of the most hazardous periods of operation of the device.

It is the purpose of the present invention to shorten the length of the run of the hull in and on the water by providing thereto a vertical lifting effect. A pneumatic means is employed for this purpose which may, at the will of the operator, discharge air under pressure from the bottom of the hull against the water and as the water is practically incompressible the air pressure thereagainst results in a vertical lifting of the hull from the water. Also the air escaping as indicated by arrows in Figure 3 of the drawings results in driving the water away from the sides of the hull, consequently resulting in a substantial reduction of water resistance to the hull.

A main air pressure pipe 9 is located longitudinally of the hull and on the interior thereof to which is connected series of depending branch pipes 10 each equipped with a check valve 11. Nozzles 12 of any suitable construction are connected to the check valves 11 and extend through the bottom 6 of the hull 5, as shown in Figure 3. An air pressure supply reservoir 13 is connected to the pipe 9 by a control valve 14 of any suitable construction equipped with a suitable operating medium 15 located in convenient reach of the pilot of the seaplane. The reservoir 13 may be supplied with air pressure in any well known manner, such as for instance an air compressor 16 may be connected thereto, as shown at 17, the air compressor being operated by a power medium 18. The reservoir 13 may also be equipped with an air pressure gauge 19 and a safety valve 20.

By referring to Figure 1 it will be seen that the branch pipes 10 and nozzles 12 are arranged approximately 20° to the vertical so that the air pressure when discharged against the water will act to drive the hull upwardly and forwardly.

The purpose of the check valves 11 is to permit the escape of the air pressure when released from the reservoir 13 by the opening of the control valve 14 but prevents sea water from entering the pipes 10 and 9 when the air pressure is cut off.

At the time of starting the takeoff of the seaplane from the water, the pilot opens the control valve 14 allowing the air pressure to act against the water under the bottom of the hull, as indicated by the arrows in Figure 3. This action of the air pressure against the hull brings about a forward lifting action on the hull, consequently

resulting in the hull rising rapidly from the water thereby materially reducing the time and distance necessary for the hull to travel in the water before the seaplane rises fully into the air. The air pressure escaping from the nozzles about the hull, as shown in Figure 3, also will tend to drive the water away from the sides of the hull thereby reducing water resistance on the hull resulting, in combination with the lifting action, in a rapid ascent of the seaplane from the water.

Of course, it is to be understood that as soon as the hull is clear of the water, the control valve 14 is closed by the pilot and when a landing is about to be made or when the hull nears the surface of the water, the pilot again opens the control valve permitting the air pressure to escape and striking against the surface of the water creates a cushioning effect on the hull thereby reducing to a minimum the shock created by the hull when contacting or settling into the water.

While I have shown and described the application of this invention strictly to the hull of a seaplane or similar flying device, it is to be understood that the same principle may be applicable, through slight modifications, to the floats used on the wings of such a flying device.

While I have shown and described the preferred embodiment of my invention, it will be

understood that minor changes in construction, combination and arrangement of parts may be made without departing from the spirit and scope of the invention as claimed.

Having thus described my invention, what I claim is:

In combination with a hull of a hydroplane having sides and a substantially V-shaped bottom provided with a stepped portion located approximately midship of the hull, rows of air pressure discharging nozzles mounted in and extending through the bottom with one row of nozzles located in the apex of the bottom and the other rows of nozzles located in the sloping portions of the bottom, said rows of nozzles extending from points adjacent the forward end of the hull to points rearwardly of midship of the hull within the stepped portion, each of said nozzles being arranged at an angle to the vertical and inclining rearwardly with respect to the hull, check valves connected to said nozzles, an air pressure pipe located in and arranged horizontally of the hull, means connecting said check valves to said pipe, and an air pressure supply including a manual control connected to said pipe and mounted in the hull.

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