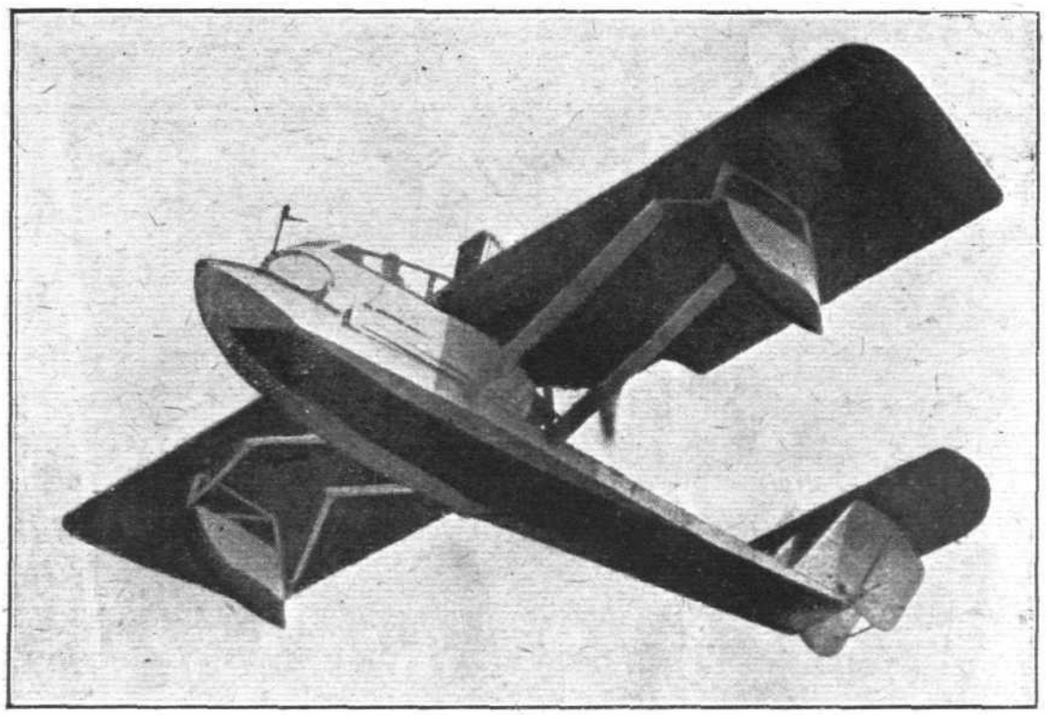
poising, and this has been borne out in practice. The hull is subdivided into 16 water-tight compartments, each being provided with its individual hand hole and ventilating tubes. Incidentally, for the altitude test a $\frac{1}{16}$-inch hole was made in each hand-hole cover in order to prevent the hull "blowing up" owing to the difference in atmospheric pressure at high altitudes.

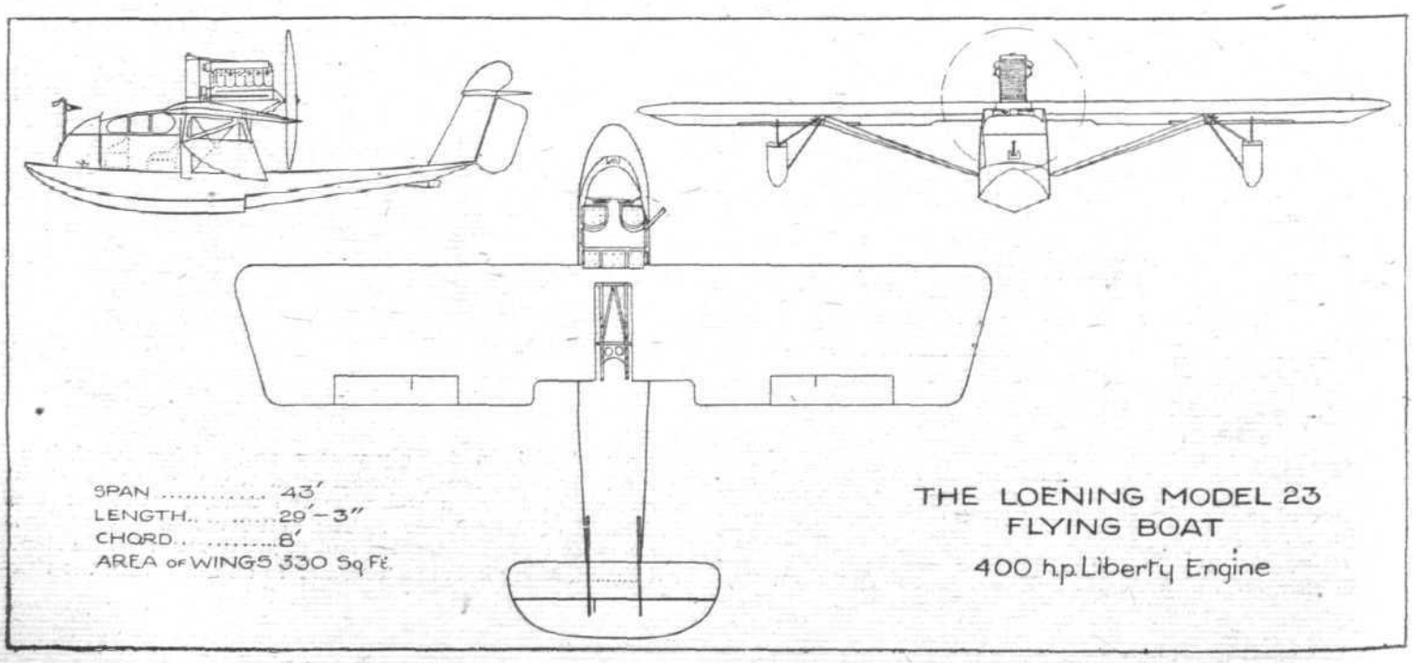
The pilot's and passengers' cockpit is built up above the deck on the fore part of the hull, and has accommodation for five persons—two, including the pilot, sitting forward on separate seats, while three are seated aft. Ample leg-room is provided for, and there is a general air of roominess about the cockpit which should appeal to the owner pilot. Access is obtained through a door in the starboard side of the cockpit, which opens on to a running board extending round the front of the cockpit and sufficiently wide to enable the crew easily to walk along it. The 400 h.p. Liberty engine—which is fitted with a 4-bladed Hartzell propeller—rests on two ash bearers supported on two M struts built integral with the hull. The space between the arms of the M is utilised for housing the petrol and oil tanks, which are under pressure. The whole structure is carefully streamlined, the cowling blending into the rear portion of the cockpit. The engine and radiator are very accessible from the cockpit, the mechanic using his seat as a stand.

The sides of the cockpit consist of a $\frac{1}{4}$-inch veneer framework, with aluminium covering, which is bolted on to the hull. Two separate wind-shields are provided for the pilot and the passenger sitting beside him. On the nose of the cockpit a small staff carries a metal pennant which answers the purpose of a side-slip indicator—based on the famous and ancient "string" employed on the early Wright machines. The pilot tube for the speed indicator is also mounted on this staff. A 57-lb. anchor is carried on the bow for mooring the boat when no buoys are available.

For the wings, which have no dihedral or sweepback, the standard structure adopted by the Loening Co. for their new Model 21 fighting monoplane is employed. The wing floats are supported by vertical three-ply struts built integral with the structure, and are braced by additional struts against side strains. The weight of the wing structure complete is 290 lbs. The tail unit consists of two parallel vertical fins mounted on the outer corners of the hull. These fins carry a one-piece horizontal stabiliser, on top of which are two



The Loening Model 23 Flying Boat: View of the boat in flight, seen from below.



THE LOENING MODEL 23 FLYING BOAT: General arrangement drawings.