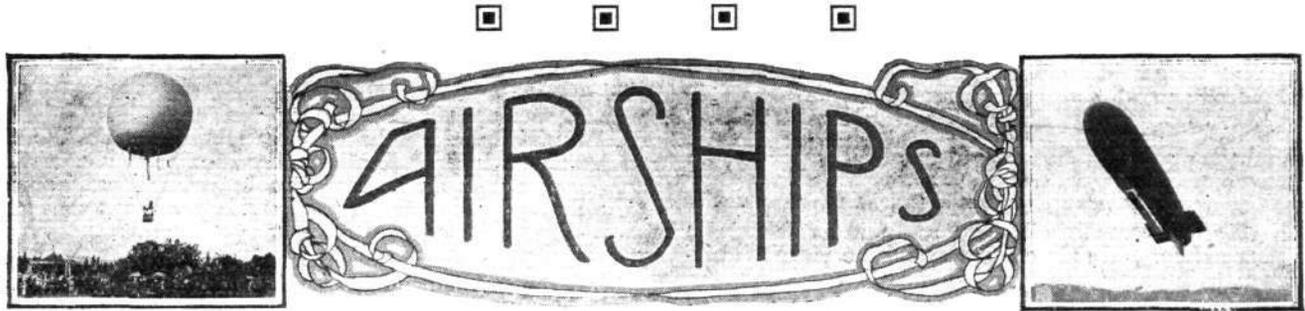


portion of the leading edge, as shown in the sketch. All the inter-plane struts are of spruce, streamline, of course, and the wing bracing is in the form of stranded cables, duplicated in the case of the lift cables and single for the anti-lift cables. The attachment of these cables and of the pin-jointed inter-plane struts is shown in one of our sketches. *Ailerons* are fitted to both upper and lower planes, and in order not to upset the *aileron* control cables when the wings are folded, these are passed from the body to a pulley on the rear spar hinge, which forms the pivot for folding the plane, and hence outward and forward again to a pulley on the front spar, from which the cable passes to the *aileron* crank lever. The elevator cables are placed outside the *fuselage*, while the rudder control cables pass inside the body, where they are protected, in the space occupied by the passengers, by aluminium casings.

The tail planes are of conventional type and do not call for any comment except to point out that the symmetrical tail plane is mounted on four brackets and is adjustable, although not during flight. The tail skid is mounted externally on a pyramid of steel tubes.

Each of the two undercarriages consists of two vees of wood, attached to the lower wing spars immediately under the engines. The following is the specification of the Central Aircraft Co.'s nine-seater:—Span, 63 ft. 6 ins. (with wings folded, 27 ft.); length o.a., 39 ft. 3 ins.; height, 12 ft. 6 ins.; weight empty, 3,850 lbs.; weight fully loaded, 5,850 lbs.; weight/sq. ft., 6.6 lbs; weight/h.p., 16.7 lbs.; engines, two Beardmore, 160 h.p. each; petrol consumption about 25 galls. per hour; oil consumption, 2 galls. per hour; speed range, 40-90 m.p.h.; duration, 2-3 hours.



THE NEW GERMAN "DELAG" COMMERCIAL AIRSHIP "BODENSEE"

ALREADY before the War there were in existence German commercial airships owned by the Deutsche Luftschiffahrts Aktien Gesellschaft, or DELAG, as the firm was commonly called from the initial letters of its title. The same firm is still in existence and has built a new airship, the "Bodensee," which is said to differ in several ways from the earlier ships. The following translation of a brief description of the "Bodensee," published in *Flugsportliche Rundschau*, may be of interest:—

"Compared with earlier types of airships belonging to the DELAG, the commercial airship "Bodensee" is of quite a different type, both as regards shape, construction, and engine arrangement. In the new airship have been incorporated all technical improvements which have been effected during the excellent development of airship construction during the War. Already at first glance it is noticeably of different proportions. It is more compact. That is to say, it is of shorter length in proportion to its diameter. While the well-known airships 'Viktoria Luise' and 'Hansa' had a length of 142 m. and a diameter of 14 m. 900, their cubic capacity being 19,700 cub. m., the 'Bodensee' is 120 m. long, 18 m. 700 diameter, and has a capacity of 20,000 cub. m. In spite of a smaller fineness ratio the 'Bodensee' is of graceful outline, and is of true streamline shape, which form, as is well known, offers a minimum of resistance. The speed of this airship is, therefore, considerably greater than that of previous ones. While these had a speed of about 70 km. per hour, the "Bodensee" does a comfortable 130 km. per hour. This increase in speed is chiefly due to the increased engine power. While the 'Hansa' had three engines of 150 h.p. each, the 'Bodensee' has four engines of 260 h.p. each, or a total of 1,040 h.p., compared with a total of 450 h.p. in the case of the 'Hansa.' The placing of the engines is also quite different, the four engines being placed in three cars, of which two are side gondolas placed approximately halfway along the length, and carrying one engine each, while the other two are housed in a rear gondola towards the stern.

"The passenger cabin is no longer built into a keel in the centre of the ship, but is built integrally with the navigation car, which is suspended under the bow of the airship. During flight the passengers are, therefore, very comfortable, there being no noise and no exhaust gases to inconvenience them.

"Apart from these improvements, the construction of the 'Bodensee' follows usual Zeppelin practice. There are 11 gas bags, each lying between two transverse formers. This division of the gas chamber into separate compartments

results in added safety of the passengers, as one or more of the gas bags may become empty without endangering the safety of the airship. The whole framework and the gas bags are enclosed in a doped cotton cover to reduce friction and to protect the balloons against strong sunlight.

"In the front gondola are all the control wheels, ballast and valve cords. In each of the side gondolas is an engine driving a two-bladed airscrew, while in the rear gondola are two engines driving one screw. At the stern are the rudders and elevators, as well as vertical and horizontal stabilisers. As all control systems are in duplicate, great reliability is provided, since one rudder or one elevator is sufficient for steering, while one engine will give the airship sufficient speed to proceed on her course. With all engines working the speed of the airship is 35-36 m. per second. With three engines running the speed is 31 m. per sec. With two engines the speed is 26 m. per sec., while with one engine only the speed is about 20 m. per sec. It will, therefore, be seen that even in case of one or more engines breaking down the airship has sufficient speed, driven by the remaining engines, to complete her journey.

"The gross lift of the airship amounts to 23,000 kg. at sea level. If the weight of the airship itself and its engines is subtracted, there is still a useful lift of about 10,000 kg., more or less according to elevation. As is well known, a height of only 80 m. reduces the lift of an airship of the size of the 'Bodensee' by about 200 kg., while an increase in the temperature of the air of 1°C. reduces the lift by approximately 80 kg. From the gross lift is usually subtracted about 2,400 kg. for petrol and oil. With this supply the airship can fly for 11 to 12 hours with all engines working, and 15 to 16 hours with three engines running. During that time the airship is capable of covering a distance of 1,500 and 1,800 km., respectively. According to the direction of the wind this distance will be increased or decreased, say between 700 km. and 2,500 km. The crew consists of about 15 officers and men.

"Of special interest is the fact that the 'Bodensee' is provided with wireless apparatus, which enables her to be in communication with both terminals of her route, while also affording passengers facility for sending private telegrams.

"The cabin, in spite of its necessarily simple arrangement, is very comfortable. The decorations and fitting-out have been undertaken by Prof. Pankok, and have been carried out at the Friedrichshafen works. The cabin reminds one of the dining-cars of a railway train, and all modern conveniences are provided."