The Dining Room of R.101 has very comfortable table and chair accommodation.
("FLIGHT" *Photo.*)

tons/sq. in. and an ultimate stress of 88-95 tons/sq. in. to be developed. Solid tubes of such lengths and wall thicknesses, to give as high stresses, would not have been practicable. In the transverse frames the steel booms are of "bulb section," owing to the manner in which the Duralumin webs are fitted into them.

The form of construction briefly outlined above is used from frame 3 to frame 12, inclusive. In the extreme nose and extreme tail of the hull a form of construction resembling more the normal Zeppelin has been employed.

Gas Bags

Closely associated with the choice of the rigid type of transverse frame is the type of gas bag used and the method of its wiring. In the Zeppelin type of construction the radial wires of the transverse frames form bulkheads between adjacent gas bags and prevent "surging" of the gas when the airship is pitched nose up or nose down. In R.101 the gas bags themselves are of a different form, known as the "parachute" type, and their wiring is necessarily also quite different. Without a number of illustrations it is difficult to convey in words the arrangement of this wiring, but briefly it consists in a disposition whereby the lift of the gas bag is transmitted not to the longitudinal girders, which would cause a lateral load on these, but to the points of intersection of longitudinals and frames. Thus the loads are changed into compression loads in the longitudinals. There are 16 gas bags.

Gas valves of an entirely novel type are used, designed to act as combined automatic and manœuvring valves. That is to say, they will automatically relieve the pressure in the gas bags when these become full, or they can be operated by the captain from the control car to release gas, even when the bags are not full. The size of valve area is sometimes very important, such as, for example, when an airship gets into an air current rising very rapidly. In R.101 the valve area is such as to be capable of dealing with a rise of no less than 4,000 ft. per minute.

The Fuel System

The special heavy-oil fuel for the Beardmore "Tornado" engines is carried in a number of cylindrical tanks housed in the transverse frames. Each tank has a capacity of 224 gallons (equivalent to 1,870 lbs. of the special fuel oil) except in a few special positions, where tanks of half this capacity are fitted. Certain of the fuel tanks are fitted with special aluminium discs and a special cutter, which enables the disc to be cut, thus releasing the fuel in an emergency. Pipe lines run through the length of the ship connecting up the various tanks and connecting them to special pressure tanks from which the fuel can be blown by compressed air to tanks in any part of the airship, thereby facilitating the feeding of the main engines and the trimming of the airship.

In this view from under the tail of R.101 the aft openings of the internal air pressure system are clearly seen. ("FLIGHT" *Photo.*)