

As regards the placing of the petrol tanks in the keel, they are arranged in three groups, corresponding to the arrangement of the engine cars. The forward group, feeding the front engine, consists of six main tanks and one gravity tank. A similar number and arrangement feed the aft car, while the central group, which supplies the two wing engines, consists of fourteen main and two gravity tanks. All the tanks are arranged for easy slipping in case of emergency.

The arrangement of the cars will be understood from a reference to the accompanying photograph of the airship in flight. The control car is placed right forward. A short distance aft of this is the forward engine car, under the keel of the airship. Approximately half-way along the length of the ship are the two wing engine cars, some distance out from the centre line, and finally near the rear end of the keel is the aft engine car. Each of the engine cars contains one 240 h.p. Maybach engine, driving pusher screws through reduction gearing and clutches. The engines are mounted with their crankshafts about 10 ins. above the floor of the car, and the lower part of the crank-case can be reached by removing a loose floor plate. The transmission includes a reverse, two wheels being in mesh for forward and three for reverse. The reduction is such that, although the engines run at 1,400 r.p.m. at full power, the propellers run at 180 r.p.m. only. Their diameter is 14 ft. 9 ins. A blower, or fan, placed in the stern of the car, is driven at a speed of 1,850 r.p.m., by means of a silent chain, and delivers $2\frac{1}{2}$ cubic metres (88 cubic ft.) of air per sec., at 100 mm. of water. The engine cars have a length of 6 metres (19 ft. 8 ins.), a maximum width of 1.8 metres (5 ft. 11 ins.), and a height of 1.6 metres (5 ft. 3 ins.).

The control car is 9 metres (29 ft. 6 ins.) long, 2 metres wide (6 ft. 7 ins.), and 2 metres high. It is divided into three compartments, of which the forward one is the control cabin, and the aft one the wireless compartment. From the central compartment access to the keel is gained *via* an automatically closing trap door, and a shaft leads through the hull to a platform on the top of the envelope. In the control cabin the rudder control wheel is placed forward and slightly over towards the starboard side. The elevator control wheel is placed on the port side. The control cabin is, of course, provided with a number of instruments, as well as with the controls for gas and air valves, etc.

The hull or envelope of the "PL27" is made of three-ply fabric, of which the inner and outer layers run longitudinally, while the middle layer is placed at an angle of 45 degrees. The tearing strength of the fabric is stated to be 2,000 kilogs. (4,400 lbs.) per metre width. In addition to this strong fabric, the hull is strengthened by so-called trajectory bands. These are bands of webbing, about 2 ins. wide, stuck to the envelope fabric and covered with water-tight cover strips. The use of these bands constitutes, we believe, a *Luftfahrzeug-Gesellschaft* Patent. The tearing strength of these bands is 1,320 lbs.

The gas space is divided, by three fabric bulkheads, into four compartments, of which the forward and aft have a capacity of 6,260 cubic metres (220,500 cubic ft.) each, while the other two have a capacity of 9,390 cubic metres (331,500 cubic ft.) each. The fabric bulkheads are reinforced with webbing, and are capable of carrying a difference in pressure between their two sides. If, for any reason, it should be

necessary to equalise the pressure in two adjoining gas compartments, this can be accomplished by a hose which is normally kept closed by being tied up, but which can be opened by the crew.

Each gas compartment is provided with an air bag or ballonnet, which when completely filled occupies 52 per cent. of the gas compartment volume. Thus, the capacity of the fore and aft ballonnets is 3,250 cubic metres (115,000 cubic ft.) each, and that of the second and third ballonnets 5,000 cubic metres (176,500 cubic ft.) each. The ballonnets consist of two portions, the lower of which, attached to the envelope, is made from two-ply fabric, of a tearing strength of 1,200 kilogs. per metre width, while the upper part is in a single thickness and has a strength of 900 kilogs. (2,000 lbs.) per metre width.

Each of the gas compartments is provided with two gas valves, placed in shafts and discharging through the top of the envelope. The openings on the top of the envelope are covered with fabric hoods. Each ballonnet has two air valves, built into the keel, and having discharge pipes leading into the open. In addition, each ballonnet has an inlet valve of the flap type, serving to admit air from the fans. The four flap valves communicate with a common pipe or hose, into which all four blowers discharge. Each ballonnet has also a pressure regulator (automatic) which ensures that there is always an excess of pressure of 25 mm. of water. Should the pressure fall to 2.5 mm., the regulator opens the inlet valve, which communicates with the common pipe from the blowers and keeps it open until the old pressure has been established, when the valve is closed. If the pressure rises to 27 mm., the pressure regulator opens either the air valves of the ballonnet or the gas valves of the gas compartment or both, according to the setting of the switches in the control car. The actual operation of pulling the air or gas valve cords is carried out by the automatic regulator, although when required, as for instance in landing, members of the crew can operate the valves direct, without the action of the regulator.

The tail planes are so attached by struts, etc., that they cannot be pressed into the envelope. They are designed for interchangeability, the fins and tail planes being identical. The elevators are, however, different in shape and size from the rudders.

Altogether, the Parseval "PL27" is a very interesting airship, and it has proved that it is possible to design even quite a large ship without necessitating a change over to rigid construction. It is confidently expected by the *Luftfahrzeug-Gesellschaft* that, if desired, even larger ships can be built on this principle, but even taking the "PL27" as she existed in 1916, the type should have a considerable sphere of usefulness at the present time, and the type has the advantage of having been tried out to the satisfaction of the designers, behaving well during manœuvring, and showing a good turn of speed. It may be expected that when Germany is once more free to develop, without the present restrictions, more will be heard of airships of this type, and we should not be surprised to hear of regular services being established between Berlin and London, which cities are sufficiently far apart to afford a considerable saving in time by travelling by air, and yet not so far as to necessitate the use of rigid airships.

Short Service Commissions in the Royal Air Force

THE Air Ministry announces that vacancies exist for suitable candidates between the ages of 18 and 25 for short-service commissions for flying duties in the Royal Air Force. Applicants are interviewed by a Selection Committee at the Air Ministry, and those selected and found medically fit are gazetted as Pilot Officers (on probation). The probationary period is six months, after which, subject to satisfactory progress, officers are confirmed in rank.

Short-service commissions are granted for four years' service on the active list, which may be extended by one year in the case of officers desirous and recommended. On completion of service on the active list, officers normally pass to the Reserve and receive a gratuity of £75 for each completed year's service: thus, if an officer completes four years and does not extend his service, he would receive a gratuity of £300 on passing to the Reserve.

Officers in the Reserve receive retaining fees and are required to undergo short periods of training each year. For all purposes of pay, allowances and promotion, short-service officers receive equal treatment with officers holding permanent commissions.

All officers entered under this scheme are taught to fly, and facilities are afforded, when possible, to specialise in certain other subjects. Candidates desirous of consideration under this scheme should apply by letter to the Secretary, Air Ministry (S. 7), Kingsway, W.C. 2.

Trans-Atlantic Flight Completed

COMMANDER SACADURA CABRAL and Capt. Cago Coutinho have at last successfully accomplished their flight from Lisbon to Rio Janeiro on the third Fairey (Rolls-Royce) seaplane, having, it will be remembered, started from Lisbon on March 30 last. After arriving at Pernambuco (Brazil) from St. Paul's Rock on June 5, they completed the remainder of the journey in stages along the coast, eventually arriving at Rio at 2.32 p.m. on June 17. They were given an enthusiastic reception on their arrival, being met by Brazilian warships together with a squadron of aeroplanes. Their arrival was the occasion of a general holiday in Rio, when the inhabitants "let themselves go" in true South American style. The last stage of the journey from Victoria, a distance of 280 miles, was accomplished under very bad weather conditions.