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No. 44

THE ROHRBACH "ROCCO" SEAPLANE

New German Commercial Seaplane with Two Rolls-Royce "Condor" Engines

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THE ROHRBACH "ROCCO" SEAPLANE.*

New German Commercial Seaplane with Two Rolls-Royce "Condor" Engines.

Dr. Rohrbach, the famous German aircraft designer, has named his latest type of seaplane "Rocco." We are not quite certain what is the exact meaning of this word, or whether it has any meaning, in German, but from the size of the seaplane to which it is applied it would appear reasonable to assume that it is the equivalent of the English "Roc," described by Webster as "A fabulous mythical bird of Arabia."

In its general design and construction, the Rohrbach "Rocco" is similar to the series of seaplanes previously designed by Dr. Rohrbach, but the effect of evolution is traceable in the design. Thus, in place of the constant-chord, constant-section wings of the early Rohrbach, the wings of the "Rocco" have tapered tips. Fundamentally, however, the new seaplane is typically Rohrbach, with a monoplane wing surmounted by two engines, a flat-sided narrow beam hull steadied when on the water by two outboard wing floats. A large dihedral angle is a feature of the design, this doubtless being a result of the high position of the engines.

*From Flight, May 12, 1927.

Constructional Features

As in the case of earlier Rohrbach seaplanes, the "Rocco" is of all-metal construction, the term "all-metal" in this case being synonymous with duralumin construction, which is the material used exclusively with the exception of a few wing fittings and bracing struts, which are of steel. A feature of Rohrbach construction is that the covering or skin, is designed as a stress bearing part of the general structure. This applies, of course, to seaplane hulls in general, but in the case of the Rohrbach seaplanes, it also applies to the wings, which are covered with sheet duralumin forming part of the wing box. This wing box may be considered as one very large spar, extending from tip to tip of the wing and, in a fore and aft direction, very roughly half-way in the wing chord to a short distance aft of the leading edge. This wing box is built up in the form of a front and rear member corresponding approximately to the front and rear spars in more orthodox types of construction, joined at intervals by fore and aft bulkheads or formers, the skin being riveted to both spars and formers. In addition, the thickness of the skin varies from point to point in the wing according to local stresses, the change being effected partly by using sheet duralumin of different gauges and partly by lamination.

The more or less closed box construction of the Rohrbach wing has necessitated a somewhat unusual arrangement of

the leading and trailing edges. These are hinged to front and rear spar at short intervals, and are attached in such a manner that by undoing a number of small bolts the leading and trailing edges can be swung up or down in such a manner as to enable an inspection of the interior of the wing box, or even minor repairs. Also, should any sea water get inside the wings, in taxying in a very rough sea, for instance, the water can be drained out, and leading and trailing edges opened so as to enable air to get at the interior of the wing and dry up any water that may have collected in out-of-the-way corners.

The seaplane hull is of the flat-sided variety, this form evidently having been chosen in order to avoid as far as possible the somewhat expensive panel beating which is necessary where sheet material has to be bent over a double curvature.

An exception is formed by the planing bottom of the hull, which, in the latest type of Rohrbach, is of pronounced "V" formation, the flat-bottomed hulls of the earlier Rohrbachs having, we believe, given a certain amount of trouble owing to leakage as a result of hard landings. There are two steps in the hull, as in most modern seaplanes, the steps being of the closed variety.

In the detail construction of the hull, as well as in that of the wings, only flat sheet and open sections are employed in order to afford cheap construction and ease of inspection. Thus, it is claimed that no hidden rivets are found anywhere

in the structure, all riveting being open to inspection from both sides. Furthermore, both during actual construction and in use later on the open sections employed render the operation of protecting the material against corrosion easier and more certain. A number of bulkheads divide the seaplane hull into water-tight compartments, and all the doors in the cabin are so made as to be water-tight when closed, thus reducing the risk of sinking in case of damage in one compartment. It is even claimed that the buoyancy of the hull is such that with all doors and windows closed the seaplane would remain afloat with two adjacent compartments damaged.

A similar principle applies to the outboard wing floats, and as a safeguard against the seaplane turning over in case of damage to a wing float, the outer few feet of the wing itself have been formed into water-tight boxes, so that if a wing float is punctured, and the seaplane begins to heel over, the wing tip will meet the water, and by the buoyancy of the wing tip boxes, acting on a long lever arm, will effectively prevent the seaplane from turning right over, although it would naturally be over at a rather uncomfortable angle.

Hull Accommodation

The hull of the Rohrbach "Rocco" is, as already mentioned, divided into a number of compartments. The nose of the hull forms what is termed a "collision compartment," which is sepa-

rated from the rest of the hull by a water-tight bulkhead. In this compartment is carried the gear for handling the seaplane on the water, such as anchor ropes, boat hooks, drogues, etc. This collision compartment would protect the rest of the hull in case of accidental ramming of any obstacle resulting in a leak in the forward part of the hull.

Aft of the collision bulkhead is the pilot's cockpit, in which are placed two seats side by side, and all the controls, instruments, etc. Owing to the situation of the cockpit ahead of the wings, the view is particularly good in all directions, especially as the hull is of relatively narrow beam.

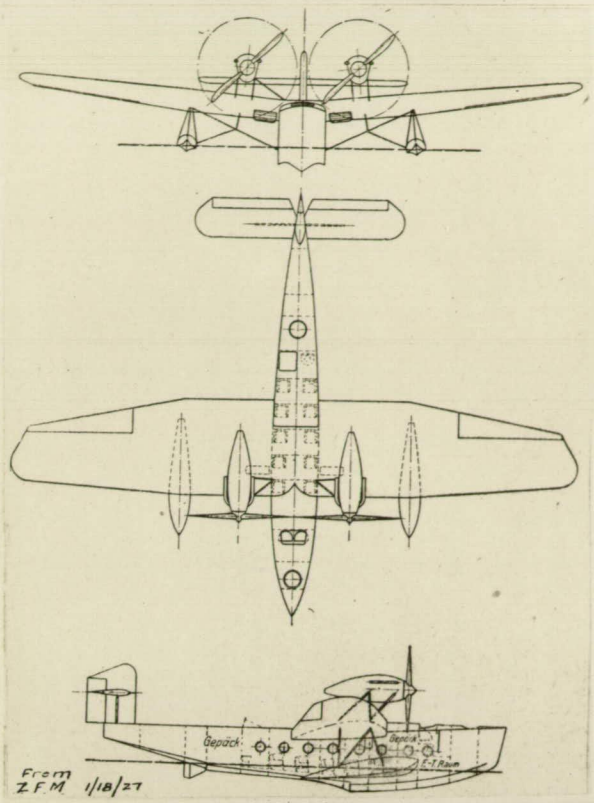
Behind the cockpit is the wireless compartment, which has a length of 0.92 m (3 ft.) and a width of 1.5 m (4 ft. 11 in.). In addition to the wireless outfit, table, seat, etc., this compartment also contains the auxiliary engine, which is so arranged as to reduce the noise of it to a minimum, by being housed inside a soundproof compartment. The auxiliary engine is a Bristol gas starter which, in addition to its main function of starting the engines, is also employed for driving the electric generator and the bilge pumps.

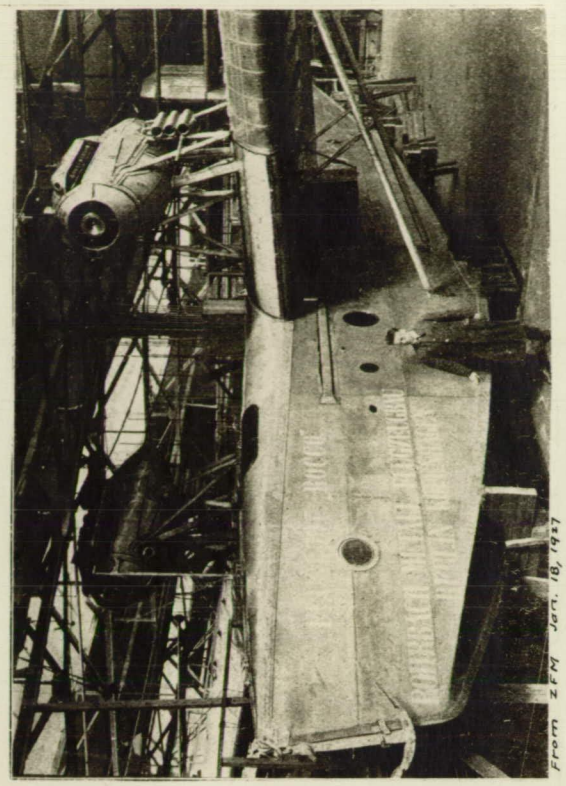
The saloon has a length of 6.8 m (22 ft. 4 in.) and a width of 1.7 m (5 ft. 7 in.), and there is ample head room for standing upright throughout. A water-tight bulkhead divides the saloon into two separate compartments with a water-tight central door giving communication between the two. The forward compart-

ment has accommodation for four passengers and the aft one for six. Entrance to the saloon is through a hatchway in the deck of the hull at the aft end of the saloon. The saloon is covered with leather and other material which is so arranged as to absorb a considerable amount of the noise from the engines. The seats have adjustable back-rests and are claimed to be extremely comfortable. The windows of the saloon are in the form of round portholes and like the various doors and hatch covers, are so made as to be water-tight when closed. The saloon is well-ventilated and heated and by each passenger's seat there is an electric light. Aft of the cabin is a lavatory and aft of that again is the luggage and goods compartment, which is entered through a hatch in the deck, and which measures 1.5 m (4 ft. 11 in.) in length, with an average width of 1.3 m (4 ft. 3 in.). Special provision has been made for lashing the luggage in such a way as to prevent it from shifting.

Power Plant

The engines used in the Rohrbach "Rocco" are Rolls-Royce "Condors" Series III, of 650 HP. each. They are supported on tubular structures above the wing and neatly cowled in. It is claimed that with this high position of the engines, the tractor airscrews are well clear of any spray that might be thrown up in a rough sea. Behind the engines and inside the cowling are the two oil tanks, while the gasoline tanks form the leading

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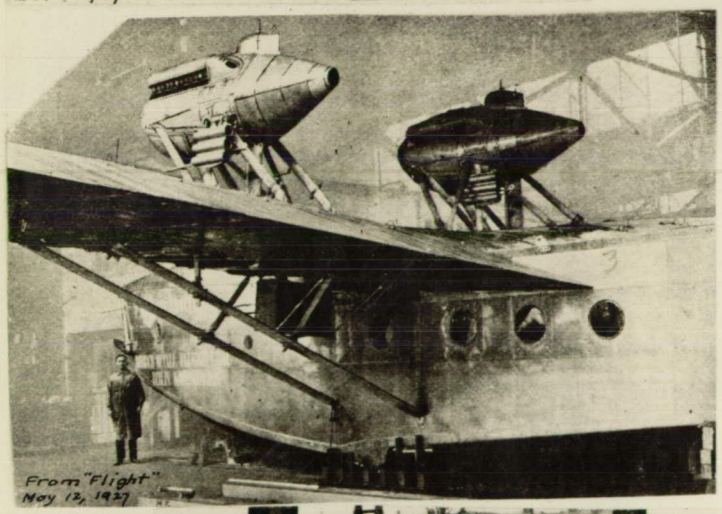
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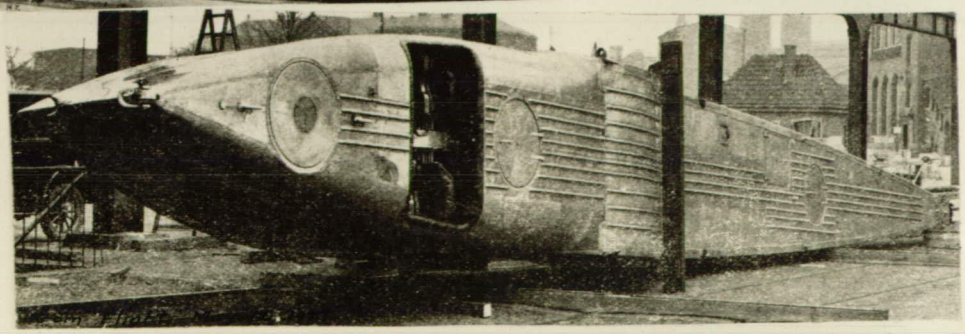

Views of the Rohrbach "Rocco" seaplane.