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THE VICKERS "VENDACE"
A Land or Sea Training Biplane
From "Flight," March 18, 1926

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THE VICKERS "VENDACE." *

A Land or Sea Training Biplane.

One of the latest products of the famous House of Vickers is a medium-sized tractor biplane, known as the "Vendace" and intended for training purposes, either as a landplane or a seaplane. It has only just been completed and probably has made its first trial flight at Brooklands. We are unable to include photographs of the complete airplane, but the accompanying general arrangement drawings (Fig. 1) and detail sketches (Fig. 2) will, we hope, suffice for the time being to give a general idea of its features.

The "Vendace" it should be mentioned is in every way a thoroughly straightforward job following orthodox Vickers' practice, and no attempt has been made to produce anything of a startling or novel character - the one aim of its designers being to turn out a serviceable and efficient airplane for the purpose for which it is intended. That their object will be achieved is, we think, apparent merely from a glance over the general arrangement drawings, for it must be admitted that the general lines of the "Vendace" are at once pleasing, clean and businesslike.

There are, however, one or two features in the design of

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the "Vendace" which call for special mention. One of these is an effective method of adjusting the height of the seats (to suit out-sizes of occupants) during flight; another, the neat housing and mounting of the power plant, and also the fact that to change the airplane from a landplane into a seaplane it is only necessary to remove the wheels and substitute floats on the same landing gear with only two additional struts. We will refer again to these points later on in our description.

As previously stated, the "Vendace" is a tractor fuselage biplane, and the wings are of equal span and chord, of moderately thick wing section. Both upper and lower wings are set at a dihedral angle and are given a sweep back of about 3°. They comprise three main sections - upper and lower center panels and the corresponding outer extensions. The center panels are only slightly wider than the fuselage, and carry the main wing extensions by means of the standard Vickers hinge fittings so that both right- and left-hand wing cellule can fold back alongside the fuselage - the pivot point being on the rear spar. This process of folding, as on all Vickers airplanes employing this feature, is very simply and quickly carried out - merely by unscrewing the two upper and the two lower bolts on the front spar attachments to the center panels. The lower center section, by the way, is carried by four bolts on extension brackets below the bottom longerons of the fuselage, and can easily and quickly be removed from the fuselage.

The wing construction follows usual Vickers practice, viz.: spruce and ply-box section main spars, and built-up spruce ribs. Compression members are spruce segmented tubes and the internal wing bracing is by swaged steel tie rods. Each outer wing cellule has a single pair of streamline steel tube interplane struts, and one front strut at the hinging line; the center sections are braced by streamline steel struts, sloping out from the top longerons of the fuselage up to the top, and down to the bottom, center section spars, respectively. Thus the external wing bracing is to all intents and purposes of the single bay type; bracing between struts is carried out by streamline steel tie-rods.

The control surfaces are of similar construction to that employed for the main wings; in the case of the fin and rudder mild steel and Duralumin tube, with built-up spruce ribs, are employed. Ailerons are fitted to both top and bottom wings; they are of the balanced type, i. e., they are pivoted on their front spars from projections on the rear wing spar, so that the portion of the aileron from spar to leading edge forms the balance, the main wings being cut away from rear spar to trailing edge to receive the complete ailerons.

Elevators and rudder are balanced, while the fin is adjusted to counteract the slip stream effect from the propeller, and the stabilizer is adjustable as to incidence during flight, being operated by a wheel on the right-hand side of the pilot's

cockpit. Dual controls of the stick and rudder bar type are provided, and the aileron controls are so arranged that the folding back of the wings will not upset their adjustment. An oleo tail skid is provided.

The fuselage is of the orthodox Vickers tubular-cum-wire bracing rectangular girder construction, the longerons and struts being of mild steel tube and the bracing of swaged steel tie-rods. From the sternpost to the engine section there are nine bays, then comes an extension of the fuselage forming a simple but effective engine mounting employing the same materials. The engine, a Rolls-Royce "Falcon III," is most "get-at-able," and its removal is quite a simple process. A deep semi-circular radiator is slung beneath the engine bearers, at the forward ends; an extremely neat metal cowling completely encloses the engine and radiator, an opening being formed for the latter where an efficient shutter arrangement is provided. A rubber packing piece is placed between the radiator edges and the metal cowling so that all air passes directly through the radiator.

Fabric is employed for the covering of the fuselage and a very neat turtle-deck fairing is provided for the top and bottom. This fairing consists of built-up wood girder arches mounted across the longerons at each bulkhead which carry longitudinal stringers.

The two cockpits are placed fairly close together and are

provided with plywood fairings. As previously stated the seats can be adjusted during flight, a feature, we think, that possesses considerable advantages, not only in a training airplane, where a variety of pilots have to be suited, but for general purposes also. For instance, in the case of a long-distance flight, when taking off, landing, or looking for landmarks, the pilot can instantly raise himself well up in the cockpit, then when he wishes to cruise in comfort he can lower himself down again. The operation of raising and lowering the seat is very simply carried out by means of a parallel-link motion actuated through a special auto-lock device by a lever at the side of the seat. However heavy the pilot may be the friction of the auto-lock is sufficient to retain the seat in any position it may be put. The arrangement is shown in one of the accompanying sketches (Fig. 2).

Gravity system fuel supply is employed, fuel being carried in two large tanks mounted in the top center section. An oil tank, with radiator, is mounted in the floor of the front cockpit. The tanks are of tinned sheet steel and pipe couplings are of the metal to metal type.

The landing gear is of the axle and V-strut type of comparatively wide track - 8 feet - with standard Palmer wheels. An improved and very compact Vickers oleo-pneumatic shock absorber is embodied in the front members of the V, which are of streamline steel tube braced with swaged steel tie-rods.

To convert the machine into a seaplane, the wheels are removed and two long Duralumin floats attached to the axle in their place, while an additional strut is fitted extending forward from each top fitting of the forward V strut (a lug being provided for this purpose) down to the floats. These struts are also braced by swaged steel tie-rods. Except for the fitting of the floats, the machine as a seaplane is otherwise identical to the land type.

In conclusion it should be mentioned that all bearings or moving joints throughout the "Vendace" are provided with pressure grease lubricators, a small but none-the-less important feature.

The principal characteristics of the Vickers "Vendace" are:

Span,	45 ft.
Overall length,	31 ft. 4 in.
Overall height,	12 ft. 9 in.
Over all width (folded),	17 ft.
Chord,	6 ft. 6 in.
Area of main wings,	534 sq.ft.
Weight light (with water)	2585 lb.
Useful load,	890 lb.
Weight loaded,	3475 lb.
Loading per sq.ft.,	6.5 lb.
Loading per HP. (290 at 2300 R.P.M.),	12 lb.
Speed range,	44 - 117 M.P.H.

Climb to 5000 ft., 5 min.

Service ceiling, 20500 ft.

As seaplane -

Overall length, 35 ft. 3 in.

Overall height, 14 ft. 1 in.

Weight light, 2960 lb.

Weight loaded, 3850 lb.

Loading per sq.ft., 7.2 lb.

Loading per HP., 13.3 lb.

Speed range, 45.5-111 M.P.H.

Climb to 5000 ft., 6.5 min.

Service ceiling, 17000 ft.

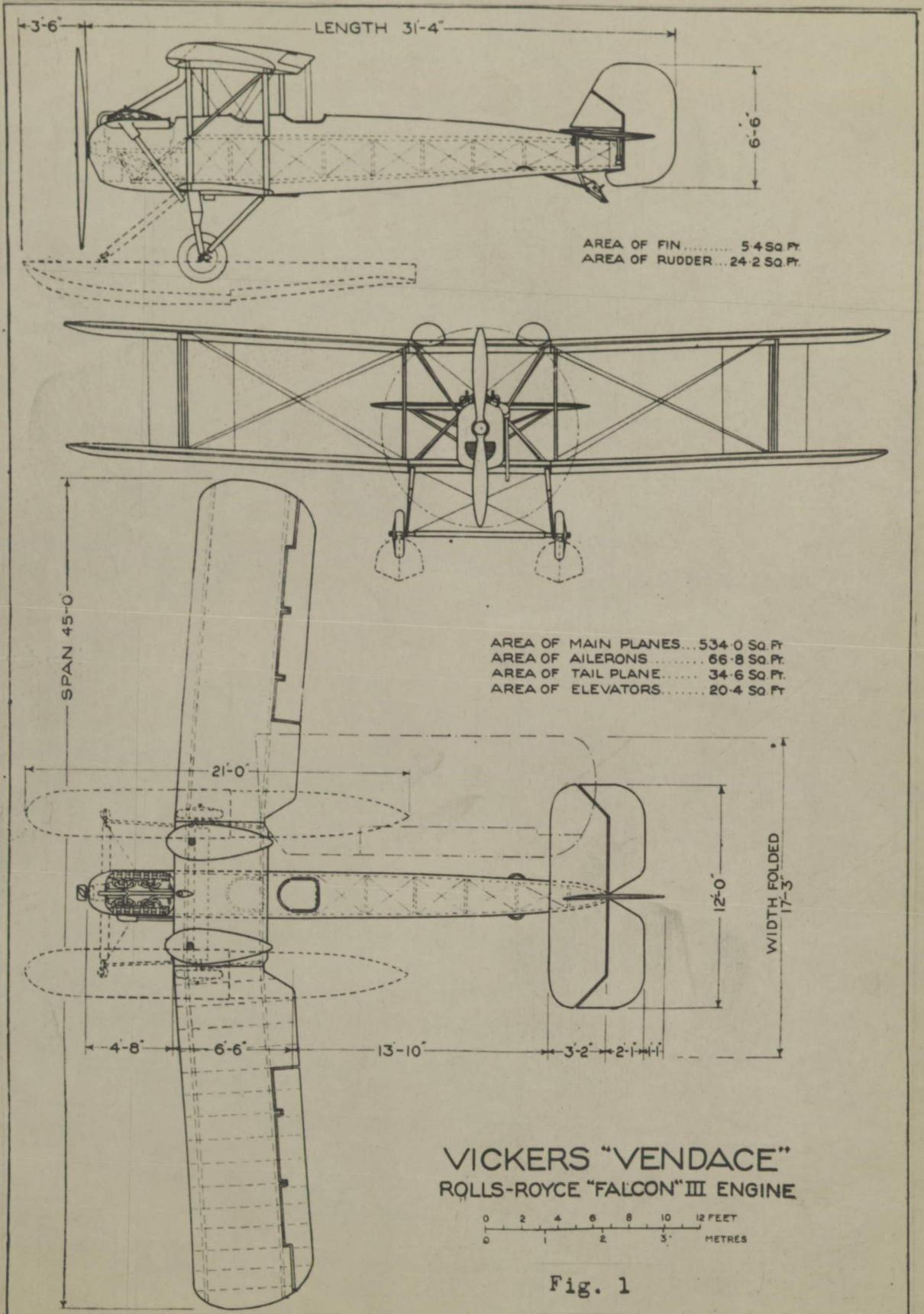
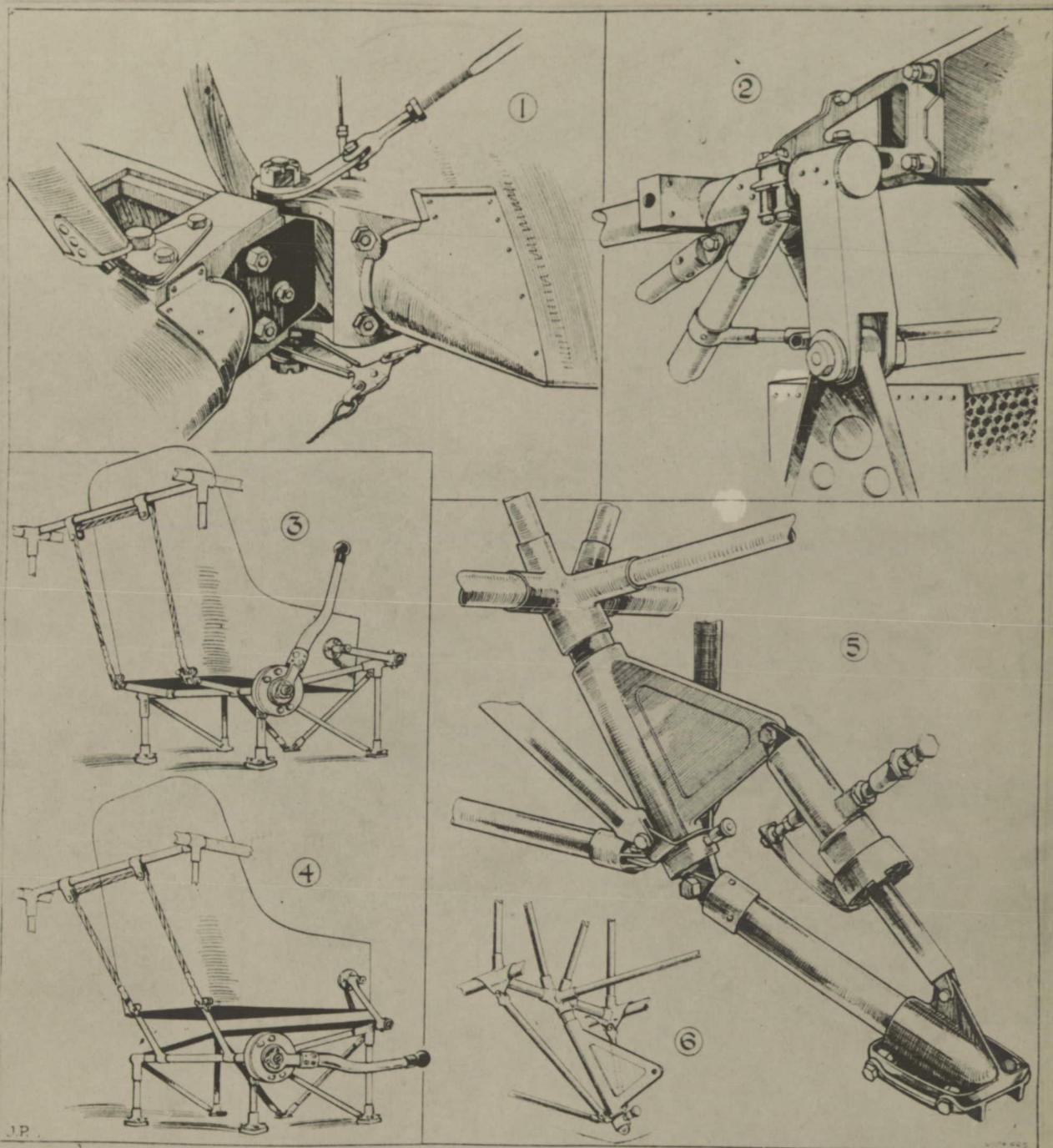


Fig. 1

THE VICKERS "VENDACE" TRAINING BI-PLANE: General arrangement drawings, to scale.
 This machine can be used as either a land- or seaplane.



THE VICKERS "VENDACE" TRAINING BIPLANE: Some constructional details. 1. This sketch shows the lower rear wing-hinge fitting—the wing being folded half-way back—and the crank, mounted on the hinge bolt, through which the ailerons are actuated, thereby enabling the wings to be folded back without upsetting the aileron adjustment. Note the neat metal fairings on the plane edges. 2. The forward end of one of the engine bearers, showing the front engine bracket and the suspension of radiator. 3. The adjustable seat, shown in normal position, and 4, in raised position. Adjustment is effected by means of the hand lever through an Auto-Lock (friction) device. 5. The Oleo tail-skid with 6, a diagram of the complete unit.

Fig. 2