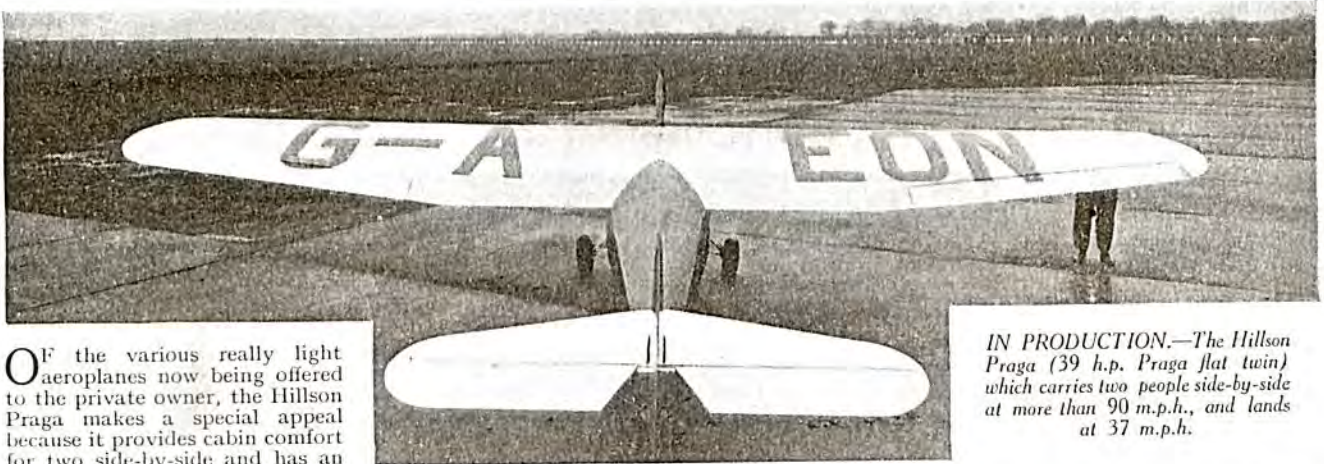


# AERONAUTICAL ENGINEERING

## A Two-seat Lightweight



OF the various really light aeroplanes now being offered to the private owner, the Hillson Praga makes a special appeal because it provides cabin comfort for two side-by-side and has an excellent performance chiefly by virtue of its carefully considered aerodynamic characteristics.

Although the air-cooled two-cylinder horizontally-opposed four-stroke Praga motor is only of 40 h.p., the machine has a top speed of 92 m.p.h. That this is no estimated figure is shown by the fact that Mr. R. F. Hall won the Isle of Man Air Derby last year in a standard Hillson Praga at an average speed of 89.5 m.p.h. for 165 miles.

That the machine is equally able to stand up to the most arduous long-range touring was shown when Mr. H. L. Brook flew from England to the Cape in a Hillson Praga. According to figures provided by the makers of the machine, F. Hills and Sons Ltd., Trafford Park Road, Manchester, 17, Mr. Brook covered 9,000 miles in 135 flying hours. He averaged 30 miles to the gallon of petrol and 1,500 miles to the gallon of oil. From these figures the intending owner can get a very good idea of what the running cost per mile should be in any part of the World.

Obviously there are a variety of ways of getting two people into the air with the aid of less than 50 h.p. One is to go for a strut- or wire-braced monoplane which makes for a light structure weight. The drag which results from this arrangement can be offset by placing the passengers in tandem and so reducing the frontal area of the fuselage.

The designer of the Hillson Praga has gone about the job in a more scientific way. He has put his passengers side by

side, tried to design a good streamline shape around them, and then hung the resultant fuselage onto a cantilever monoplane wing. A wing of this kind, though more difficult and consequently more expensive to build than the simple fabric-covered type with two "plank" spars, has the advantage from the owner's point of view of requiring no maintenance or rigging. Also on the Praga the whole can be removed by undoing four bolts. The makers claim that it can be taken off by two men in five minutes.

Official approval has been set on the performance of the machine in that the "type" Hillson Praga passed its Martlesham tests last November without a hitch and now has a full Certificate of Airworthiness.

The Praga will take off with two up in about 100 yards. At  $\frac{3}{4}$ -throttle it climbs round about 57 m.p.h. and reaches 3,000 ft. in 10 minutes. The flat motor in the nose allows a good view forward even on the climb. In cruising attitude the view becomes excellent. There is nothing to obstruct the view downwards on either side.

The general consensus of opinion seems to be that the machine behaves extremely well at the stall and has no vicious tendency to drop a wing and start spinning.

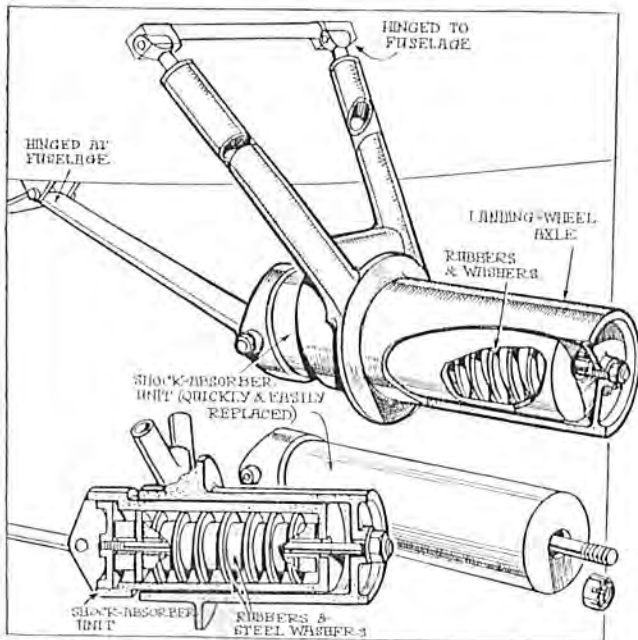
The structure is extremely simple as can be seen by studying the accompanying line drawings. The wing has a skin of three-ply and a normal structure of two box-spars, ribs and

*IN PRODUCTION.*—The Hillson Praga (39 h.p. Praga flat twin) which carries two people side-by-side at more than 90 m.p.h., and lands at 37 m.p.h.



*FOR THE OWNER PILOT.*—Two more views of the Hillson Praga. Beside the machine above is Mr. W. W. Greenfield, Chief Engineer; below Mr. J. Shoesmith, Test Pilot. We wish Farnborough would explain why mass-balances must be put on such low-powered craft. Such unnecessary weight merely wastes payload.





**EASY TO REPLACE.**—The neatly replaceable shock-absorber unit on the Hillson Praga.

which the Hillson Praga has been got through its Martlesham tests and put into production.

The present rate of three a week just about copes with the demand from overseas for the new type. But with the coming of the Spring and the consequent rise in sales in this country, Mr. Chown's experience of the mass-production of woodwork generally should ensure that production keeps ahead of the rising demand, so that private owners will not have to wait for what is obviously a very practicable light aeroplane.

**DIMENSIONS.**—Span 36 ft. 1 in. Length 22 ft. 1 in. Height 7 ft. 2½ in. Wing area 164 sq. ft.

**WEIGHTS.**—Tare weight 625 lb. All-up weight 1,050 lb.

**PERFORMANCE.**—Top speed 92 m.p.h. Cruising speed 81 m.p.h. Stall 37 m.p.h. Climb to 1,000 ft. in 3 min. Ceiling 11,800 ft. Range at cruising speed 300 miles.

**PRICE.**—£435.

### This'll Make You Flutter

"**H**A!" cried Martin, "here are a fourscore volumes of the 'Memoirs of the Academy of Sciences'; perhaps we may find something good in this collection." "Yes," answered Pocourante, "so we might if any one of these compilers of this rubbish had only invented the art of pin-making; but all these volumes are filled with mere chimerical systems, without one simple article of useful information." (*Candide, Voltaire.*)

There are two kinds of Musical Comedies. One is produced to amuse the public. If it does *not*, it runs for a week, then the producer and cast are out of a job. The other type is one of those million dollar shows. Among such is one with an appropriation of £400,000 a year. Its only audience is the design staff of the firms of the Aircraft Industry. And this show runs all the year; the producers are the Aeronautical Research Committee.

The design staffs really want to see problem plays. Sometimes they get them, but more often they get musical comedy.

One of the best of recent times is that given as a New Year's gift, which might well have been reserved until April 1. These shows are always presented behind closed doors, so we shall refer to this one under its short title: "The Compelled Jittering of Flying Machines with Particular Application to Herr Doktor Ing. von Boote's System of Forecasting Critical Velocities for Palpitation."

The manuscript is marked "Confidential" in at least two places,—and no wonder. If such epoch-making discoveries were allowed to fall into the hands of a Foreign Power they would be able to build machines which even Imperial Airways would buy in preference to the products of the British industry.

All designers are just crazy about swing music and rhythm at the moment. This looked like quite a new tune for their technical staffs to play on their stick-rules. But designers are incurable optimists, and after diving happily into the score they found on the 17th folio that the whole thing was really a solo to be played by the test pilot on a pair of wings, prior to getting a more lasting set.

There were indeed 27 more folios of calculations, diagrams, appendices and incidental music, but the theme song was in the hands of the pilot and Mr. Irvin.

For did not the composer say "A *reliable* forecast of the critical jitter speed is to be expected only if observations are made at a tempo approximating to the palpitation velocity of the instrument."

In other words, test pilots must find the fibrillation before we can tell them what it is, which sounds rather more like a post mortem than a prognosis.—"FIRST NIGHTER."

### The One blade Prop

**H**ERE is the latest idea from the United States. It is an airscrew which has only one blade. The thing is balanced by having a counterweight on the opposite side of the airscrew-hub equal to the weight of the blade.



The inventor claims that it increases the speed of an aeroplane by 25% to 30%, increases the rate of climb by 33½%, and eliminates vibration.

Apparently the theory is that if one uses two blades in line they do not actually work exactly as a two-start screw would do and screw themselves through the air independently of one another, but in fact interfere with one another because each works directly in the wash of the other.

The usual theory is that a two-blade screw works through the air very much as do the upper and lower planes of a normal biplane. In support of the single-blade screw there is the idea that it works like a monoplane and does not suffer from interference.

This idea suggests that still better results might be got by mounting one blade of a two-blade airscrew considerably in front of the other on the airscrew shaft, at, say, a distance equal to the chord of the blade. This notion may be all wrong, on the other hand it may contain the germ of a great idea.

We do know that single-blade windmill-screws work very well on windmill dynamos and such things, but we have never heard that they are actually more efficient than normal two-bladers, and anyhow they do their work in a way exactly opposite to that of an airscrew.

As this one-blade prop idea comes from America possibly somebody on this side of the Atlantic will have the enterprise to try it out. It should be comparatively inexpensive. In fact even a private owner, or at any rate any flying club, can try it out by using the surviving blade of a damaged airscrew and fixing, albeit with very necessary care, a counterweight on the side from which the damaged blade has been removed.

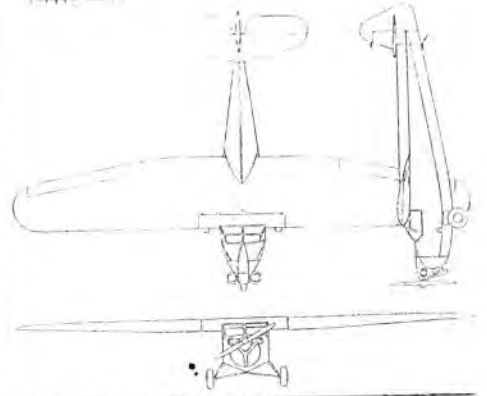
This would not definitely prove the efficacy of a one-blade prop because the pitch, area and length of a single blade might have to be quite different from those of a single blade of a two-blade airscrew which suited that particular aeroplane.

Anyhow, the idea is worth trying out and we hope that somebody, such as our enterprising friend F. G. Miles of Reading, will have a try at it.

# The Hillson Praga



level; cruising, 80 m.p.h. (129 km.h.) at 1,000 ft. (305 m.); stalling, 42 m.p.h. (67.5 km.h.); range, 320 miles (515 km.); duration, 4.00 hrs.  
**Climbs.**—Initial rate, 360 ft. per min. (1.83 m. per sec.); at 10,000 ft. (3,048 m.), 40 ft. per min. (.204 m. per sec.); service ceiling, 8,000 ft. (2,440 m.).



F. Hills and Sons Ltd., Trafford Park, Manchester, 17.

**Classification.**—Two-seat enclosed high-wing monoplane. Unfaired fixed undercarriage.

**Accommodation.**—Dual control side-by-side.

**Power Plant.**—One Praga B two-cylinder opposed air-cooled motor.

Output—35 h.p. for take-off; 37 h.p. for initial climb; 40 h.p. at sea level max. for level flying.

**Consumptions per hr.**—Fuel, 2.75 galls. (12.5 litres); oil, .5 pint (2.84 litres).

**Construction.**—Wings, wood, plywood covered. Fuselage, wood, plywood covered.

**Dimensions.**—Span, 36 ft. (10.98 m.); length, 27 ft. 7 ins. (8.42 m.); height, 8 ft. 6 ins. (2.59 m.); wing area, 164 sq. ft. (15.23 sq. m.).

**Weights.**—Empty, 584 lb. (265 kg.); payload, 123 lb. (101 kg.); loaded, 1,029 lb. (466 kg.).

**Speeds.**—Max., 93.3 m.p.h. (150 km.h.) at sea

## The Safest and Cheapest 'Plane for Private and Instructional Flying . . . . .

For school and private flying the Hillson "Praga" is unrivalled. It has full C. of A., two comfortable seats side by side in an enclosed cabin and full dual control. This light sporting Cantilever high-wing monoplane represents remarkable value at the price of £385. Running and maintenance costs are likewise remarkably low. The fuselage and wings are built entirely of wood and plywood and are of a type proven in many years of use. The wings can be dismantled in five minutes by removing four bolts.

The engine is simple and sturdy and can be used steadily for as long as 250 hours flying without overhaul. The machine positively cannot spin.

*The Aeroplane*

WITH "PRAGA" B 40 H.P. ENGINE	
Span	36 ft.
Length	21.5 ft.
Height	5.5 ft.
Weight empty	584 lb.
Disposable load	445 lb.
Wing loading	6.27 lb./sq. ft.
Power loading	25.7 lb./sq. ft.
Top speed	93.3 m.p.h.
Cruising speed	79.6 m.p.h.
Landing speed	37.3 m.p.h.
Climb (in 3 min.)	1,310 ft.
Duration	3.5 hr.
<b>£ 3 8 5</b>	



F. HILLS & SONS, LTD., TRAFFORD PARK, MANCHESTER  
 Telegrams: "Lipseeld." Telephone: Trafford Park 1894 (2 lines).



The Praga Baby, another of the light, low-priced economical machines referred to by the writer of the article.

FLIGHT 28/11/35