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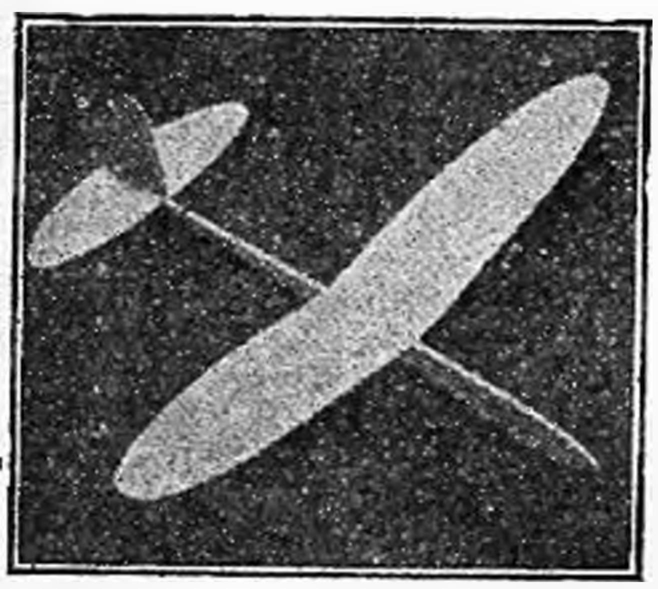

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(INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR")

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ON PETROL PLANES

Under date of September 16th we received the undernoted letter from the Air Ministry (Department of Civil Aviation) :—

Ariel House,
Strand, W.C.2.

C.S.22713/C.H.2(a)

16th September, 1944.

Sir,

I am directed to refer to Air Ministry letter C.S.22713, dated 22nd June, 1944, concerning the flying of model aircraft, and to inform you that in the light of prevailing conditions the Department has decided that the restrictions which govern the flying of model aircraft may now be relaxed to some extent.

Subject therefore to the following conditions, which will supersede those contained in Air Ministry letter under reference, any type of model aircraft (including gliders), whatever its motive power, may now be built and flown anywhere in the British Isles :—

(*a*) There is to be no flying of model aircraft between the hours of sunset and sunrise.

(*b*) There is to be no flying of model aircraft in officially prohibited areas or within two miles of any Royal Air Force Station.

(*c*) All petrol-driven model aircraft are to be set to fly in a closed circuit only.

(*d*) Wing span in all model aircraft is not to exceed 10 ft.

(*e*) Maximum engine running time for petrol-driven model aircraft is to be forty-five seconds.

(*f*) Maximum airborne time of any petrol-driven model aircraft is to be not more than two minutes on any single flight.

Copies of this letter have been sent to the Society of Model Aeronautical Engineers, The Association of British Aeromodellers, The Model Aircraft Trade Association, and The Model Aeronautical Press, Ltd., for information.

I am Sir,
Your obedient Servant,
(Sgd.) R. S. S. DICKINSON.
for Director-General of Civil Aviation.

The Secretary,
Royal Aero Club,
119, Piccadilly, W.1.

The above letter results from a communication addressed by the Managing Editor of this Journal, under date of September 8th, to the Air Ministry asking for the removal of the " ban " on the flying of petrol 'planes south of " the Bedford line." We are pleased to have taken such an important and successful part, during recent months, in re-establishing peace-time conditions for the flying of all types of model aircraft, on behalf of *all* aeromodellers in Great Britain.

ON DOODLE BUGS

It is, of course, a trite saying that " nothing is new under the sun." This may be said of what are commonly known as Doodle-bugs as much as of many other " new " inventions. Consider the following description of " Automatic Aerial Torpedoes " which were advertised as far back as 1896 :—

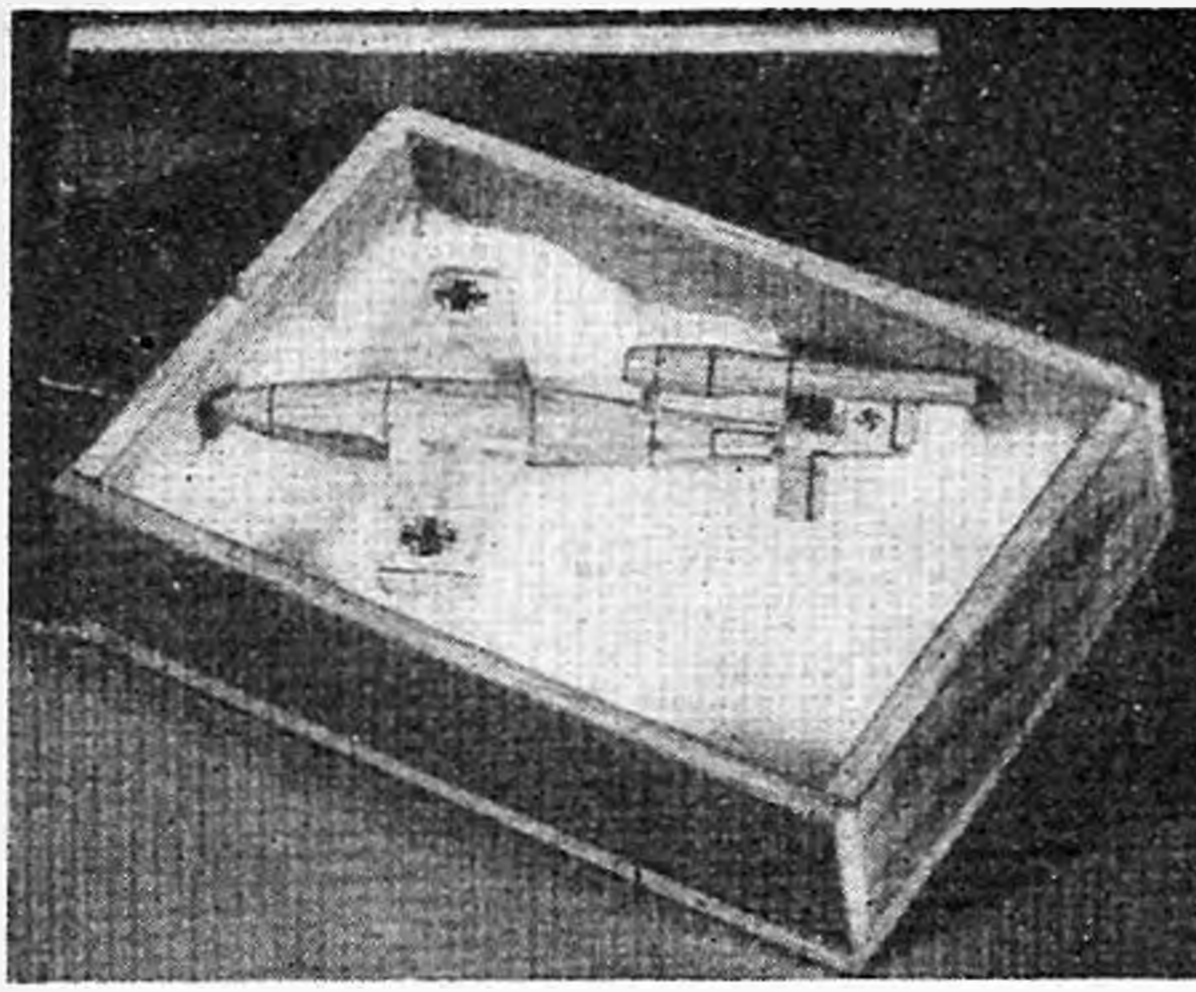
" These machines are made to run up to a speed of Twelve Miles per hour. They are made to send out in a calm or when the wind is going in a favourable direction. They are driven by Kane-Pennington Engines Steered Automatically as to direction and altitude, and used to carry dynamite or other explosives. For example, to destroy the enemy several hundred of these machines are started to arrive at their destination during the night. Each torpedo may be made to carry a Ton of Dynamite, and to drop it automatically at such a point as the senders may desire. When the charge is dropped, the Aerial Torpedo drifts away and is lost. This is the only known way to destroy the enemy without danger to the attacking foe, owing to the fact that no operators are required, due to the automatic appliances.

" Orders taken to furnish Governments with these Aerial Torpedoes at short notice."

We quote this description from a recent copy of " The Engineer," which reminded its readers that in its issue of May 22nd, 1896, it carried a full page advertisement which included a line illustration of a torpedo-shaped object, complete with control vanes and propeller at one end.

" The Engineer " is unable to state whether business resulted from this advertisement. For ourselves, we like so much that reference to " orders taken to furnish Governments with these Aerial Torpedoes at short notice." Apparently the members of the Aerial Torpedo Syndicate had no nationality, and were ready to sell their explosive-carrying torpedoes to anybody—in fact, both sides !

A more recent type of flying bomb was that described in " Practical Mechanics " during or just after the last war, sent in by one of our readers, who encloses a photograph of a "self-propelled plane." According to this photograph, the bomb plane is a biplane with enclosed fuselage, mounted on a rather incredible form of tricycle undercarriage—two wheels in front, and one at the rear. According to the caption underneath the photograph, there is a " system of chain gearing at the rear of the chassis which operates the governor, which disconnects the plane's body from the running gear when the speed is sufficient for flight." Details of the adjustment which " assures such extraordinary accuracy in the explosive descending on the desired objective, and caused by detaching the wings from the body at a predetermined distance," are not disclosed. That is the delightful, if somewhat annoying, part of these early inventions ; they claim to do much marvellous things, but when we come to the question of explaining exactly how a particular operation is carried out, " operational instructions " are singularly conspicuous by their absence !



Specimen of the now extinct "Doodlictus Bugitis" species, sent by reader M. J. Bindon, of Bristol.

Nevertheless, we feel that full credit should be given to the Aerial Torpedo Syndicate and/or Mr. E. J. Pennington, who so many years ago conceived the idea of a torpedo "which may be made to carry a ton of dynamite and to drop it automatically on such a point as the senders may desire," and who, apparently, *first* originated the idea of the "flying bomb."

The introduction by the Nazis of the Aerial Torpedo—Flybomb—Doodle-bug—call it what you will—has, of course, aroused considerable interest amongst aeromodellers, and we hear already of one enthusiast of whom it is claimed that he has built a jet-propelled model aircraft. At the moment it is on his "secret list," but we hope in due course to obtain particulars in this Journal.

Considerable interest has also been aroused in the question of rocket projectiles, either for assisted take-off for large petrol planes on rough ground—which to our mind sounds quite a sensible idea—whilst, finally, of course, some of the more scientifically minded of our readers are apparently devoting quite an amount of thought to the firing of rocket-projectiles into space.

Before these latter enthusiasts go too far with their theorising, it might be well for them to consider the effect of heat due to speed, on the structure of their projectiles. In the 1850's, Joule and Thompson (later Lord Kelvin) carried out a considerable number of experiments to ascertain the rise in temperature resulting from the resistance encountered by a body moving through the air. They found that the temperature rise was approximately proportional to the square of the velocity. Joule recorded in 1859 that at a velocity of 175 feet per second, the rise was 1 degree centigrade, whilst at a speed of 372 feet per second (approximately 250 m.p.h.), the rise was 5·3 degrees centigrade. By extrapolation, Joule gauged that when the speed rose to 5,280 feet per second (one mile per second), the temperature would be about 900 degrees centigrade, *i.e.*, some 1,650 degrees Fahrenheit.

Whilst this temperature is below the melting point of steel, it is well above that of aluminium and other alloys, and it would, of course, also be well above the ignition point of a number of fuels.

Needless to say, we are not anticipating that aeromodellers—or for that matter any kind of modellers—are going to achieve such phenomenal speeds in the near future. We merely mention this aspect of ultra-high-speed perambulation through space, as one worthy of consideration. Modern machine-guns have muzzle-velocities up to close on 3,000 feet per second (2,000 m.p.h.); at which it might be seen that relatively high temperatures are already obtained.

It is, of course, not anticipated that the ultra-rapid descent from the stratosphere by a rocket-propelled projectile would take more than a few seconds; and consequently the high temperatures indicated would in all probability not be reached. Nevertheless, we hope that we have said enough to enable readers to judge correctly the value of the suggestion, recently put forward, that high velocity projectiles may return to this earth encased in ice!

A unique transparent model of a C-54 Douglas "Skymaster." Incorporating interior lighting, operated by the switches on the left, this model is used for training aerodrome ground staff and technicians.

CONTENTS OF THIS ISSUE

RADIO CONTROL NEWS LETTER

EDITED BY PETER · HUNT

We are indebted to Air Age Inc. (Proprietors of Model Airplane News) for the illustrations and much of the information contained in this article.

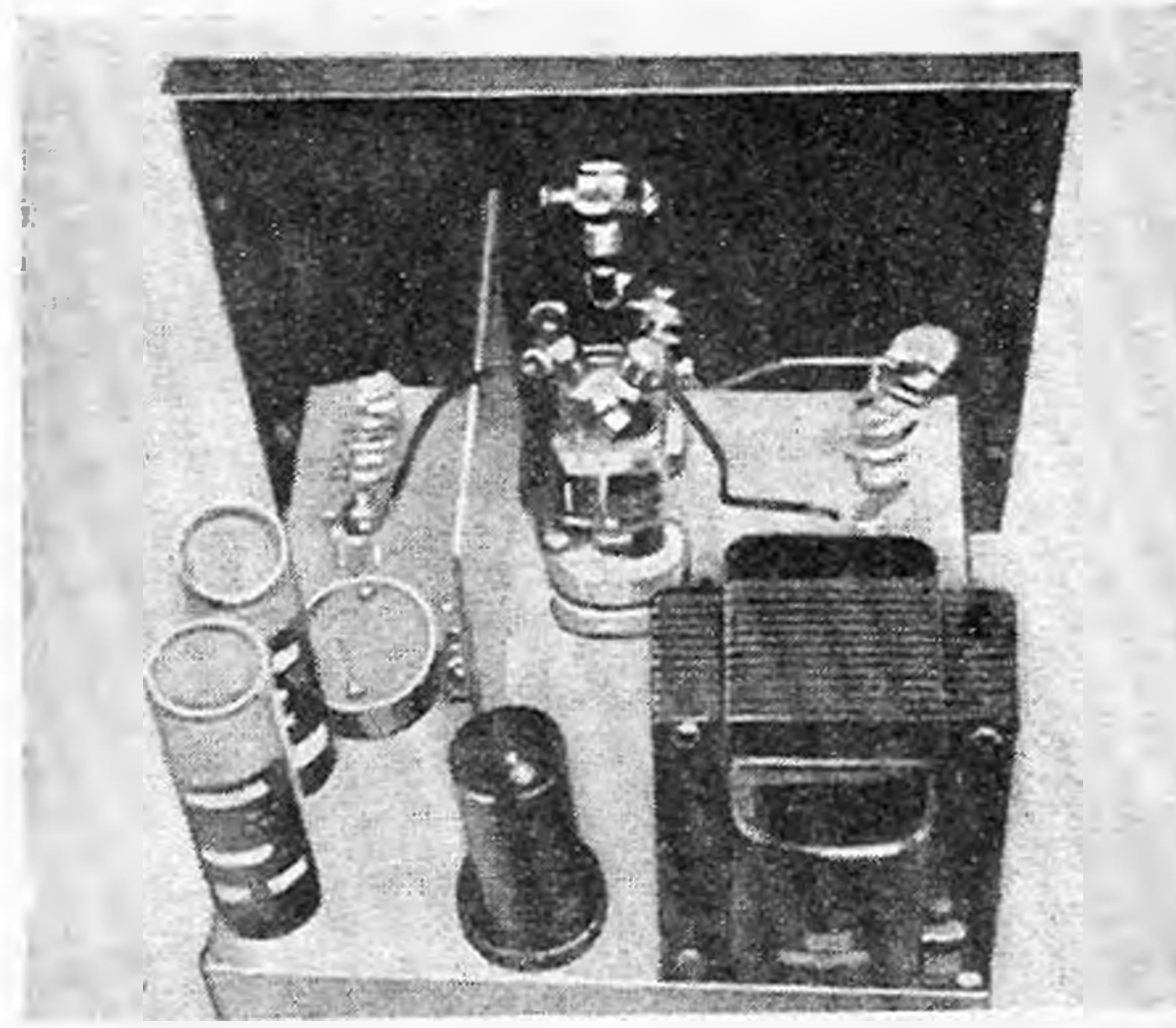
AT the risk of being condemned as hackneyed, by beginning this article with the well-worn phrase " In spite of the times in which we live," we continue by adding that our fellow aeromodellers are still hard at it in the States, and more interest than ever is being taken in Radio Control. Straight from the Press on the " other side " comes a News Letter outlining current methods of Radio Control. As it is impossible to reprint it in its entirety, the following extract is intended to outline some of the more interesting points.

Generally speaking, fundamental principles are unaltered, control being either sequence, or audio-frequency control, and the frequencies most often employed are 56 M.C.S. (5 m.) and 112 M.C.S. (2½ m. approx.).

Of the transmitters described, photograph 1 shows a well constructed 5 watt transmitter operating on 56 M.C.S., using a dual triode R.K.34 in a double circuit, the crystal being cut for 28 M.C.S. Fig. 1 shows the circuit employed. This transmitter is not modulated and merely " pushes out " a carrier wave.

Photograph 2 shows a really portable transmitter for the 56 M.C.S. band. It is housed in a wooden 8½ in. by 4 in. by 2¾ in. box, complete with its batteries. The valves are 1·5 v. acorns of the 958 type connected (Fig. 2) in the extremely simple T.N.T. circuit. With 6 m.a. at 90 v. on the plates of the 958's the power input will be about ½ watt, sufficient to work a moderately sensitive receiver at about 800 ft.

A popular system of control employs a different frequency for each control service required. A transmitter suited to this method is shown in photo 3 and the



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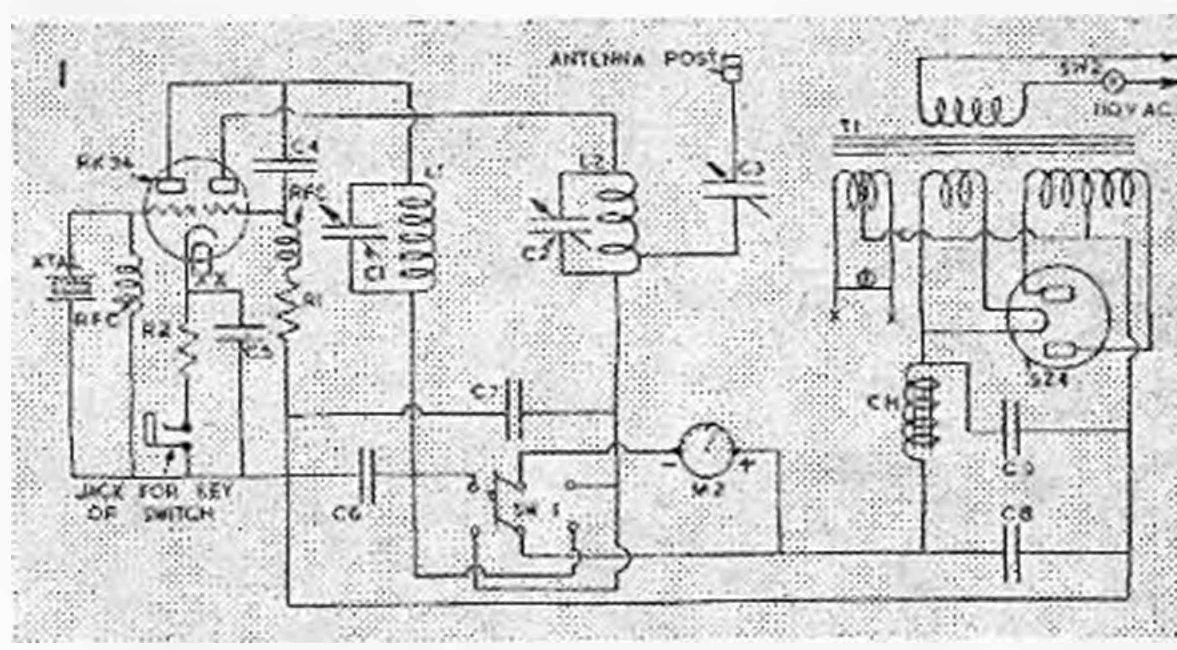

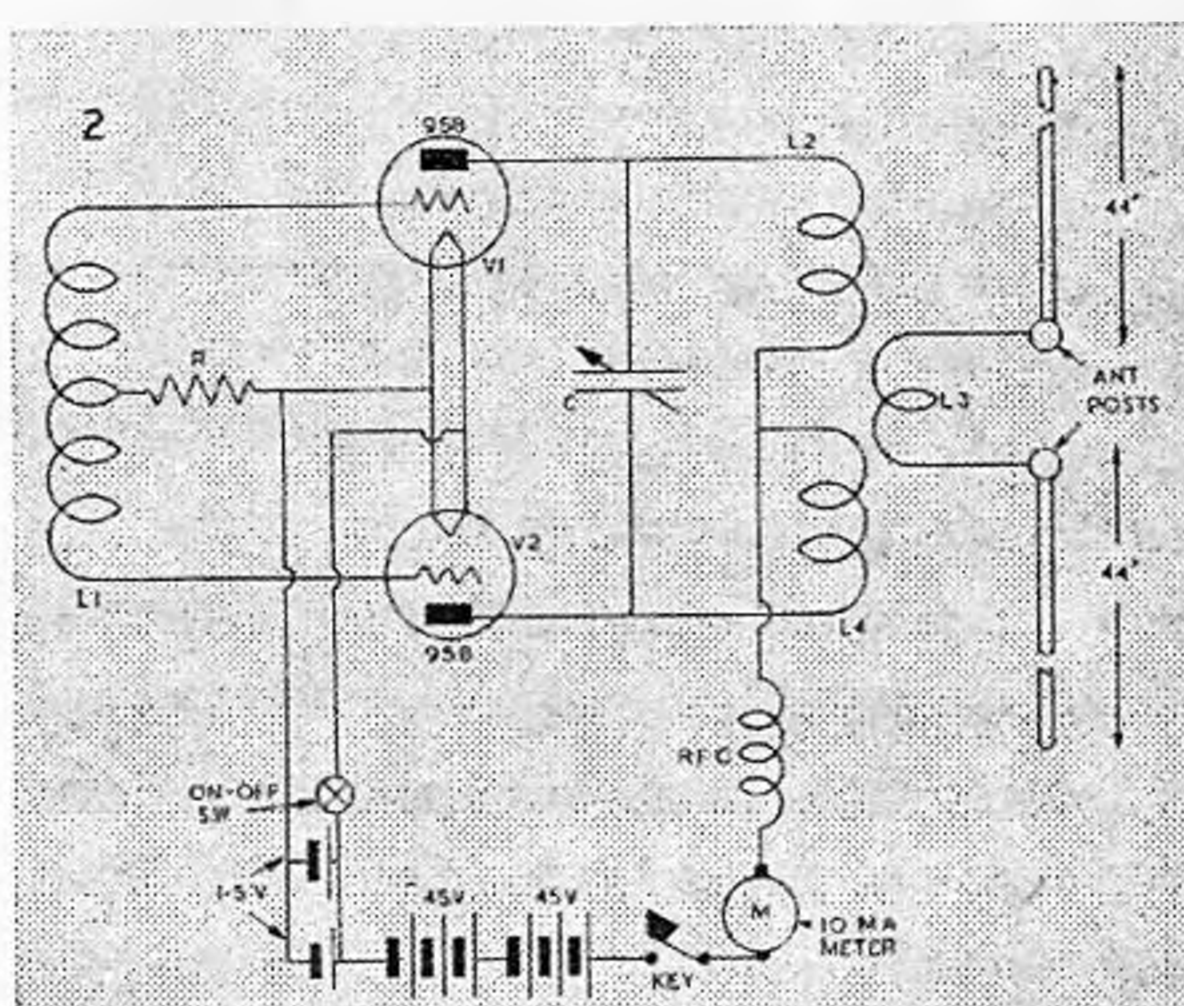

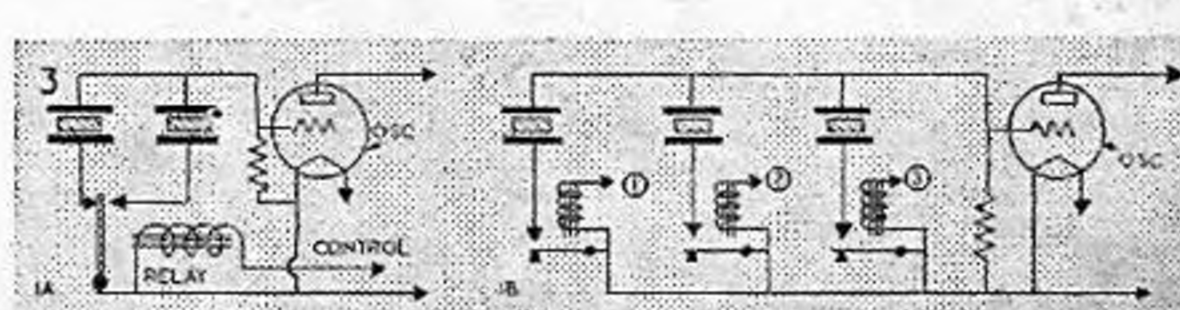

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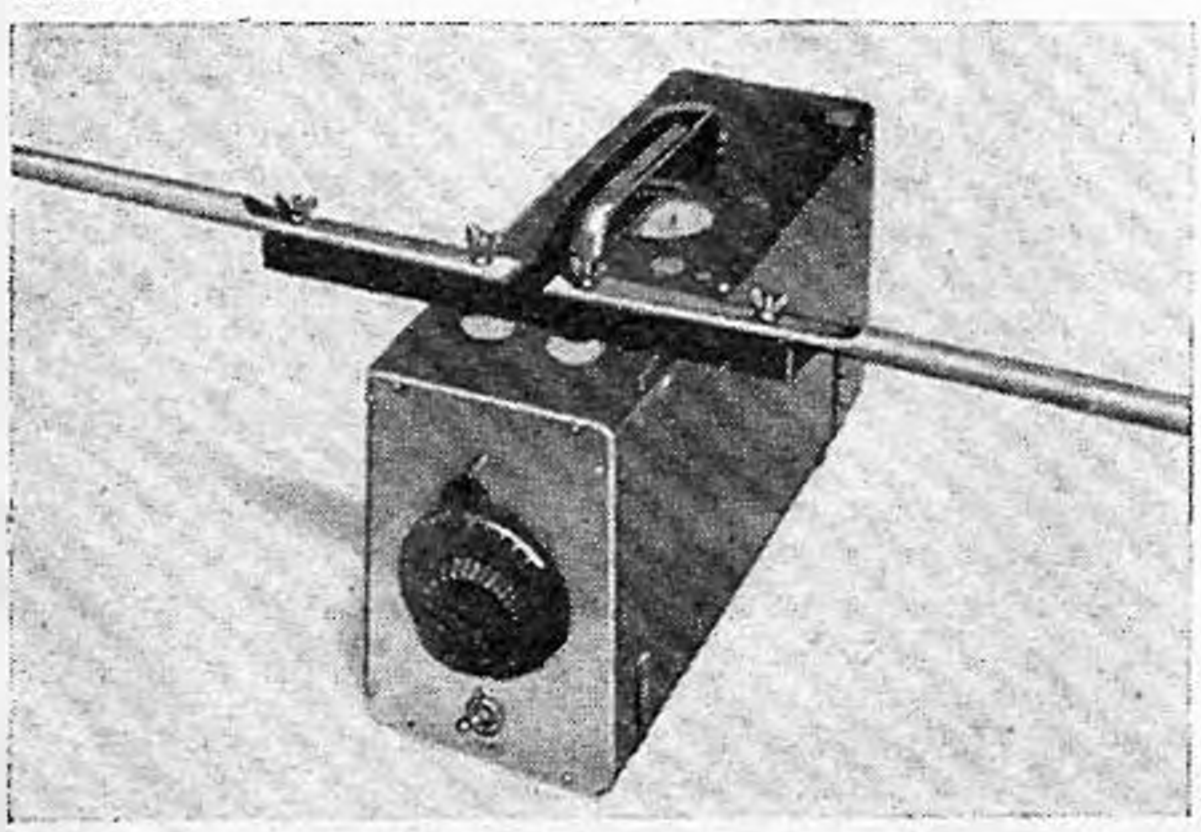

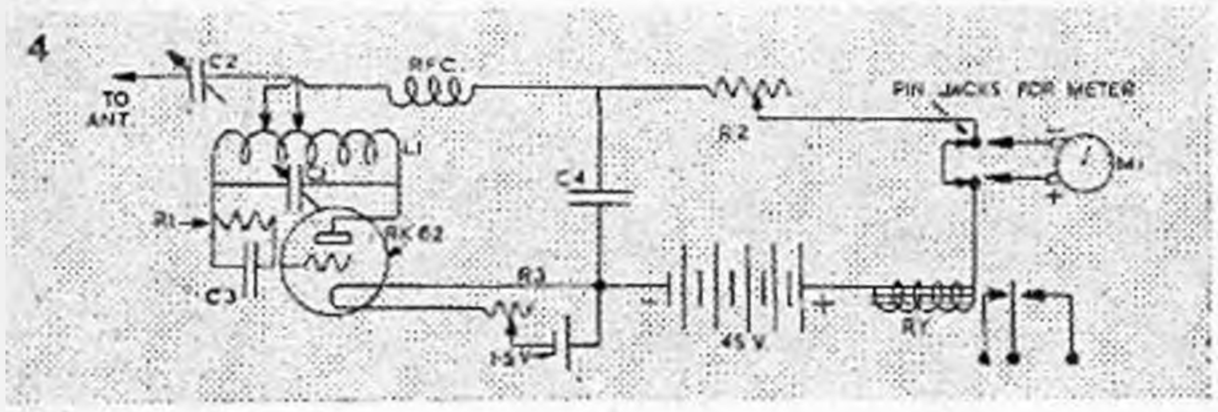

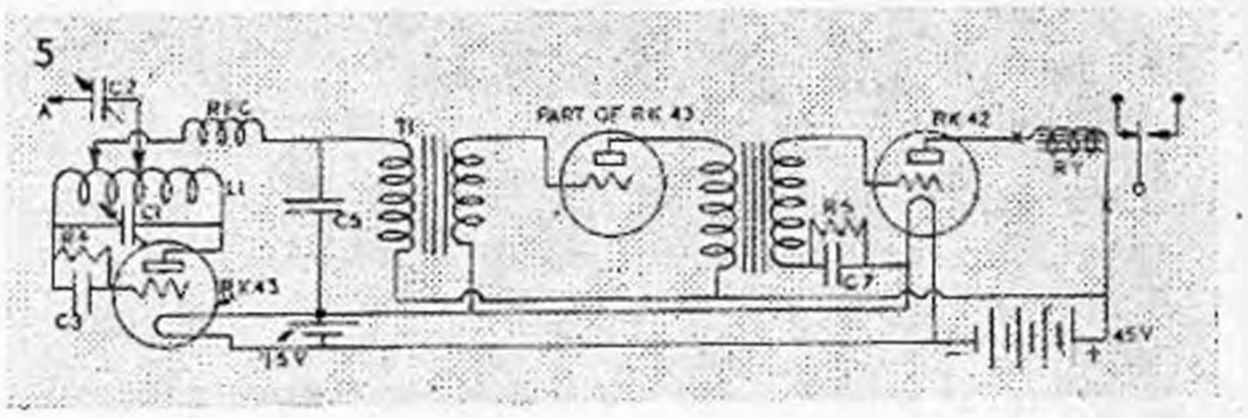

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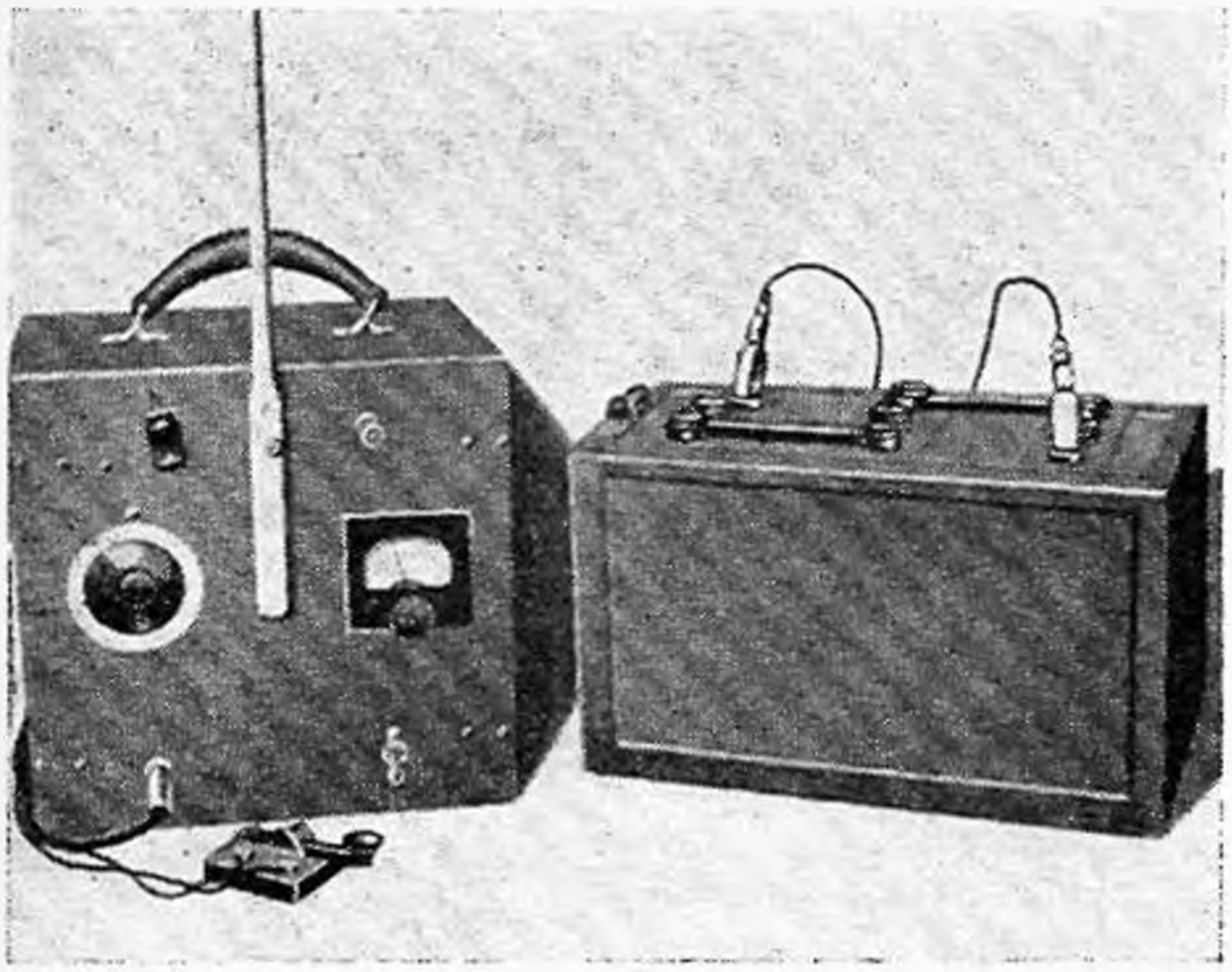

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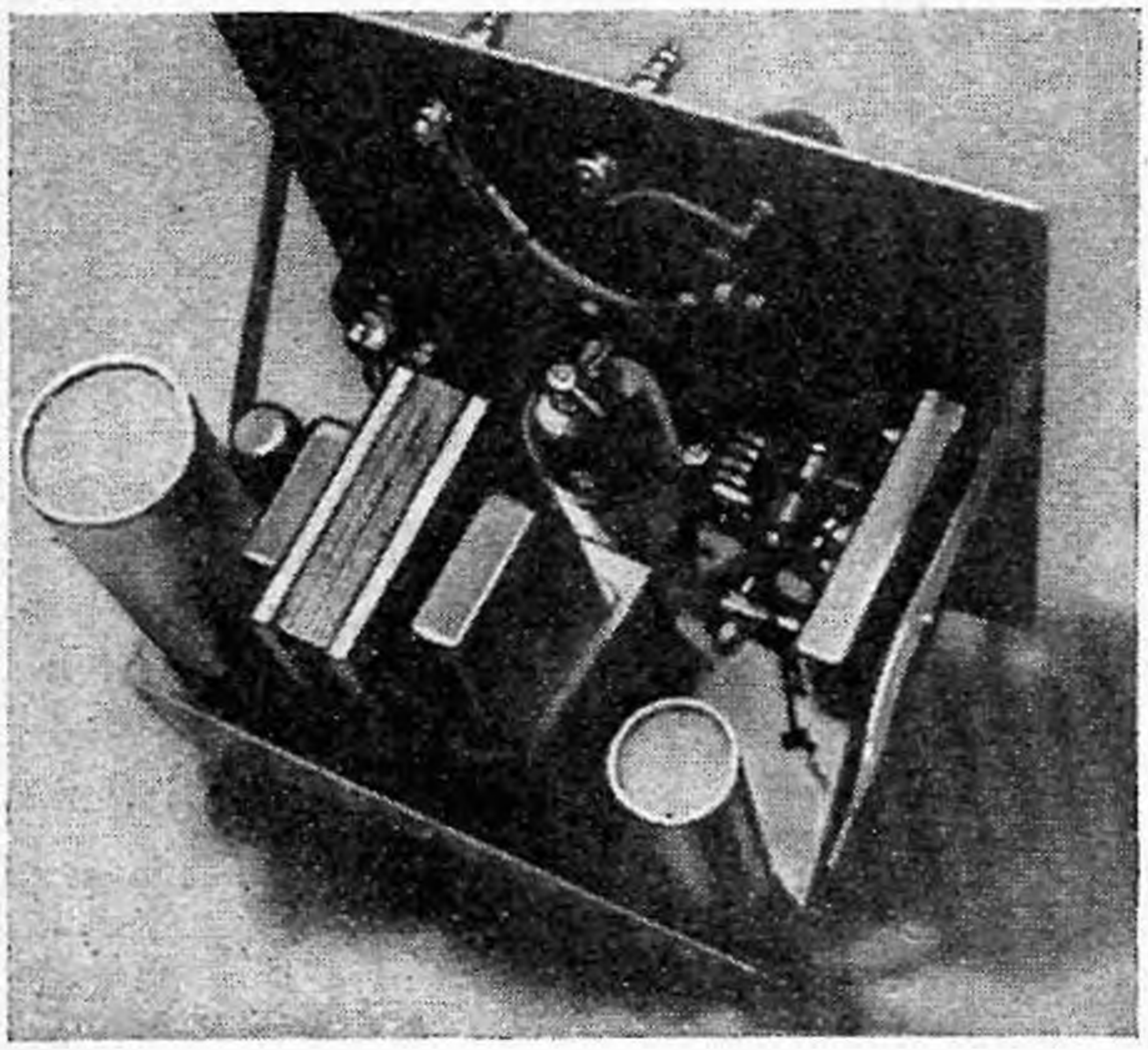


Photo No. 5.

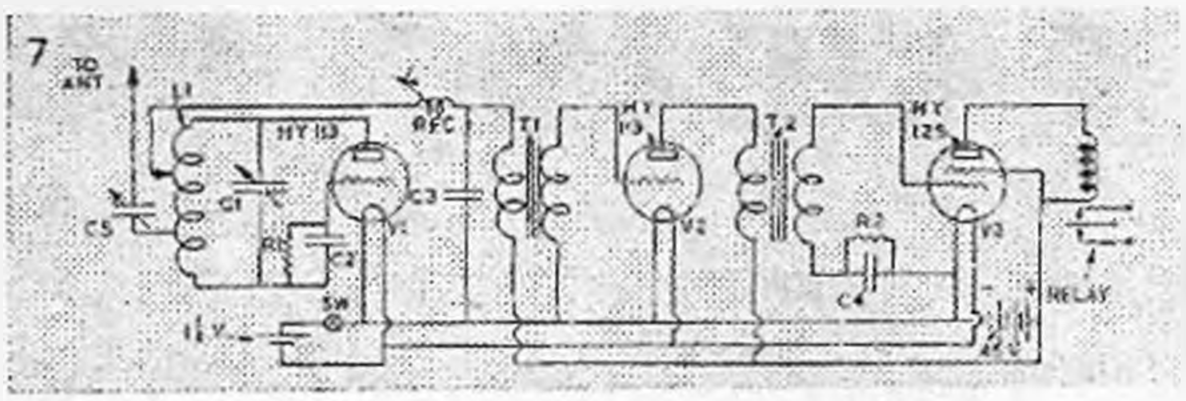
circuit in Fig. 3. As can be seen in parts 1a and 1b of Fig. 3 the crystals for the oscillator valve are brought into circuit by means of relays which are operated from the control box. When the requisite frequency has been selected by operating the relevant relay, the set is of course keyed in the normal manner. The relays are essential to keep R.F. from the frequency selector switch, which will probably be some distance from the transmitter. Photograph 4 shows a relatively high power transmitter using an R.K.59 valve in the T.N.T. circuit which was used for the portable transmitter above. There is no need to discuss this transmitter at greater length apart from saying that it operates from a 6 v. accumulator (heavy duty type), the vibrator power pack delivering 400 v. at 90 m.a. to the R.K.59. This represents an input of 36 watts. Such a transmitter is remarkably cheap and easy to build, but in this country would require a lower power input to keep within the law.

From the receiver point of view great use is made of the famous (and in this country, scarce) R.K.62 valve, which is a miniature 1·5 v. gas-filled triode. This valve is employed in the standard super-regenerative circuit, as shown in Fig. 4, the relay operating by the fall in anode current when the receiver is turned to an incoming signal. This means negative operation of the relay, and it is interesting to note that greater interest and effort is being taken to devise circuits which will operate the relay positively, *i.e.* with a rise of anode current. Such a circuit is shown in Fig. 5, where the output valve has a rather unusual grid connection, operating in much the same way as the normal grid leak detector. The transformers are U.T.C. " ouncers," which weigh about 1 oz.; the heaviest approach to these in this country being the miniature microphone transformers supplied in a small box 1 in. cubed and weighing 1¼ oz. Fig. 6 shows the various ways which are normally used for simple rudder control, sub-figures E. and F. being especially interesting, as they show multi-frequency control employing two receivers of different frequency.

Fig. 7 shows an unusual type of receiver, again using ouncer transformers and with the " leaky grid detector " type of output circuit for positive relay action. This receiver is pictured in photograph 5 and weighs about 8 oz. with its relay.

There is no doubt that positive relay operation is the best method, as, for one reason, adjustment is easier, and more robust relays which are less prone to vibration troubles can be used using the R.K.62 valve, the difference in anode current with, and without, signal, is only about 1·2 m.a. at the most, whereas by positive operation, uses of 3 to 4 m.a. can be achieved with little trouble.

In one respect the Americans certainly " have it on us." This is in regard to Servo motors; for there are, on the American market, several makes of extremely small reliable and light electric motors. The most suitable types for radio control are the Knapp and Pittman H.O. (00) gauge model railroad motors. Their weight is 2 oz., and they work reliably on 3 v. at 200 m.a.



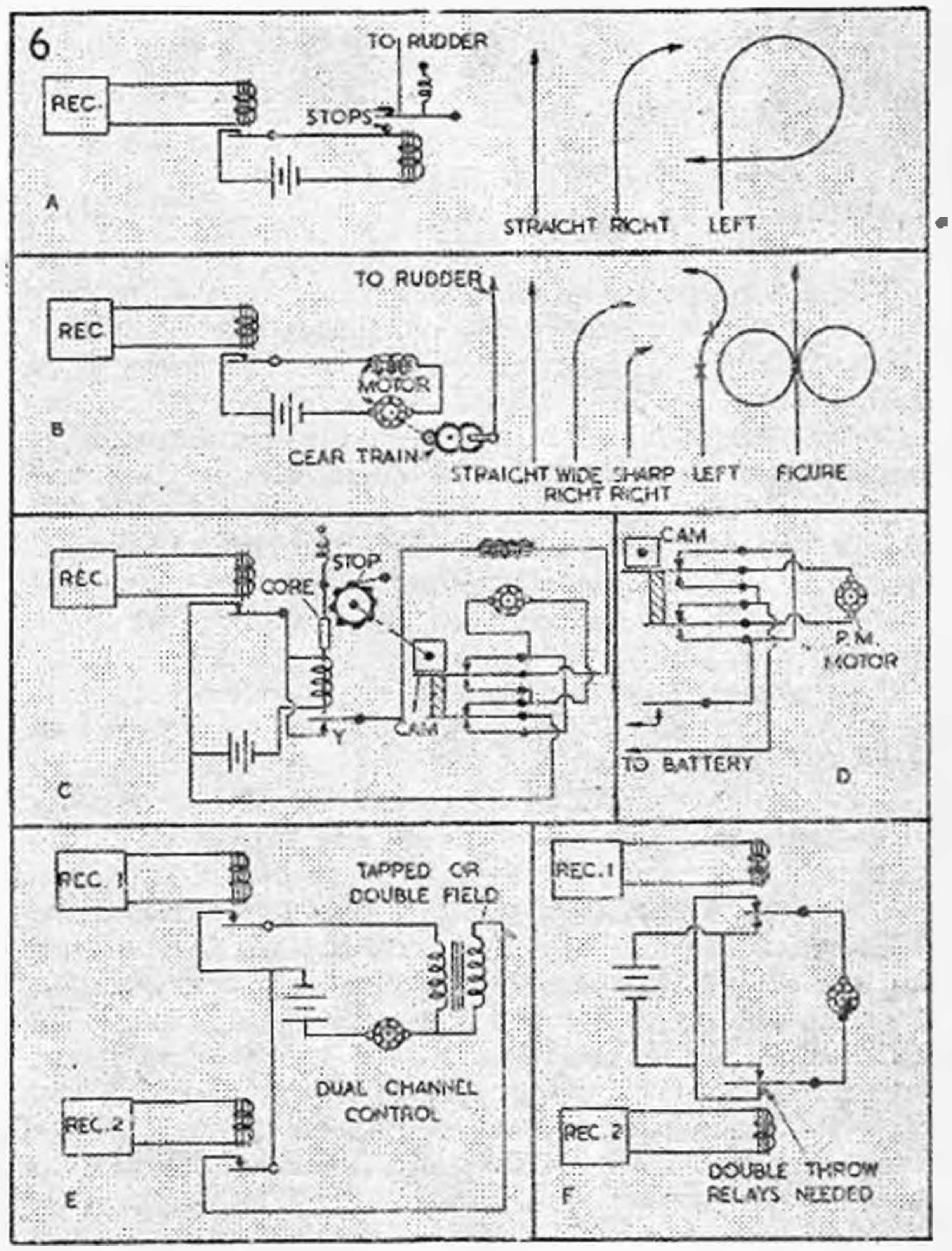


Photo No. 6.

Such a motor would certainly be a boon in this country.

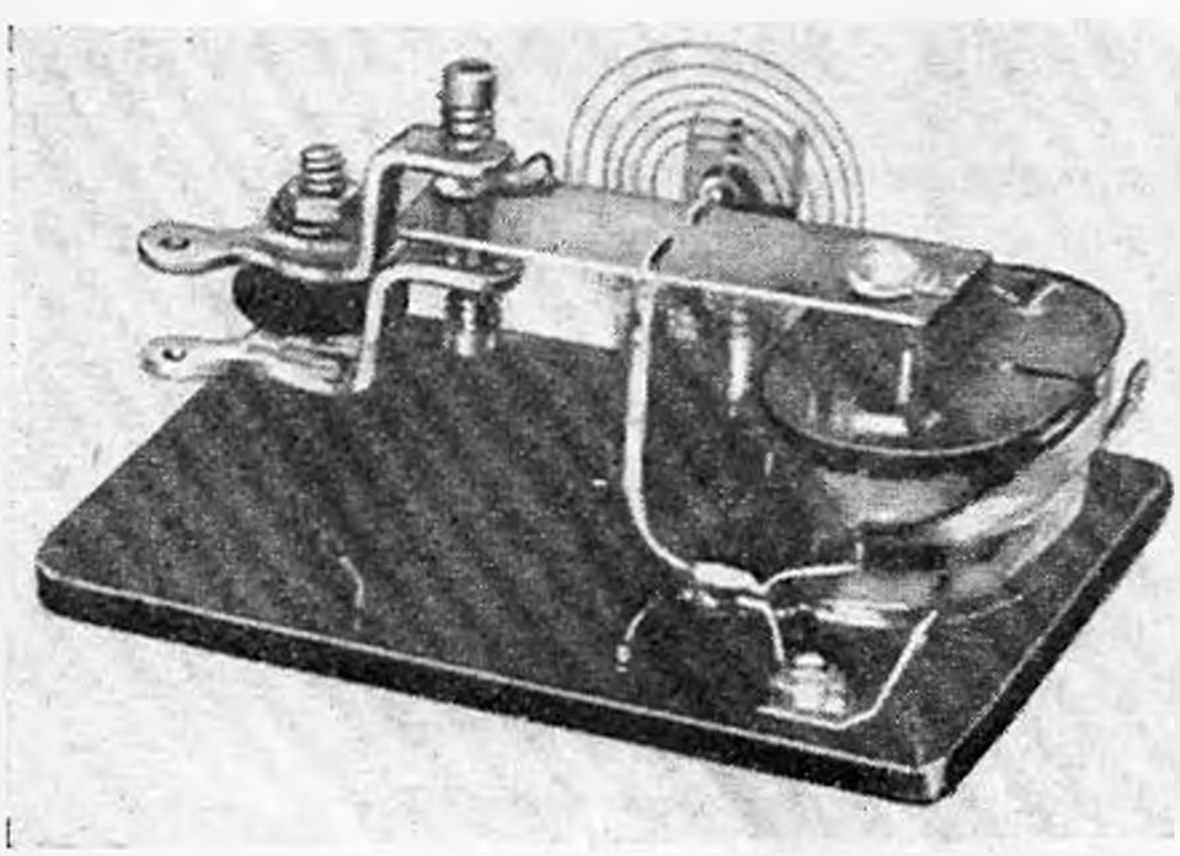
The Pittman motor shown in photograph 7 is designed for R.C. use and weighs, with its case and gear train, 3 oz.

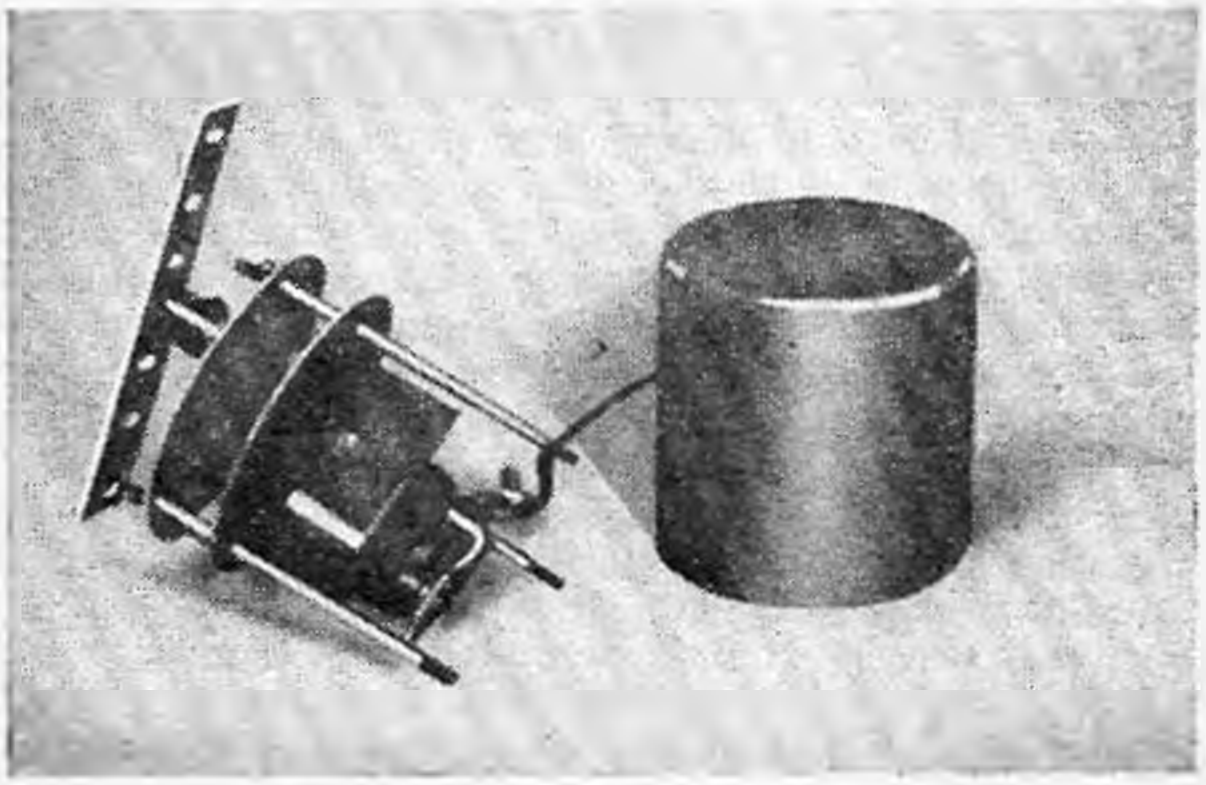
Relays are an important component, and here again our friends are lucky with the Sigma high resistance relay, which weighs about $1\frac{1}{4}$ oz., and which can be supplied in various resistance values. However, to suit everybody's pocket, photograph 7 shows a home-made relay using an earphone bobbin electro magnet. The construction is simple and self-explanatory, and the resistance will depend on the earphone bobbin used. The higher the resistance the better, and, at a pinch, two or even three bobbins could be used on the core.

It is a pity that greater justice cannot be done at the moment to the interesting booklet from which the above facts were taken, but the time will come again, etc. !

There is, however, one passage in the narrative which bears repeating *in toto* : " It is perhaps well to emphasize again that an amateur radio licence is absolutely necessary to work this equipment. Failure to heed this warning will mean an unpleasant tangle with Uncle Sam, with the possibility of a stiff fine or imprisonment." So it can be seen that we are not the only folks bound down by rules and regulations.

Photo No. 7.





A.B.A. NATIONAL

BY C. A.

CHAIRMAN OF THE ASSOCIATION OF BRITISH AEROMODELLERS

THE first fact which impresses one on reading the advance announcement of the A.B.A. National Competitions is that never before in the history of British (and possibly world) Model Aeronautics has such a generous and all-embracing programme of competitions been offered. In every competition the prizes are definitely worth while, and where separate Junior Sections have been included it will be noted that the value of the reward for their efforts is as great as the Seniors, recognising that the Juniors' efforts are just as important to the movement.

Then we note that there are no entrance fees for entering any of the competitions, once you are a member and have paid up your annual subscription plus the extra charges for the Sections in which you are especially interested. All of the contests run by A.B.A. are open even to *non*-members on payment of a small fee.

Again all flying contests are decentralised in the fullest sense of the word. No decentralised competition can be so interesting or so satisfactory as a competition at which all of the competitors are present, competing against one another and in full view of a critical audience, but we feel that there are certain features of decentralised contests that can be improved, and chief among these is the fact that if a decentralised contest is held all over the country on the same day, it is inevitable that the weather varies from district to district, and we find, on an analysis of the contest reports, that someone has had vile weather conditions and yet another competitor has had ideal conditions, and as a direct result, the best model has not always won. This unfortunate fact has led to criticisms and disappointment in the past, and the obvious reply is to allow the competitors to choose their own day and time to fly. It is quite natural that they will choose the best possible conditions, and therefore the result will be that the models flying under ideal conditions should give a much more satisfying and comparable performance. If the competitors do not care to choose such conditions, they have only themselves to blame if their results are not of the best!

Another very important and interesting point is that competitors in the Services can " have a go," that is, if they are at all able to indulge in their hobby. Doubtless, many " lone hands " in the Services can get two observers from among their fellow Servicemen, and no doubt by their interest and efforts stimulate new interest among those who watch their attempts.

In the " Duration " Class, with the exception of the Wakefield Models, the rules are sufficiently simple and flexible to encourage a very large entry from a very large cross-section of the Aeromodelling fraternity. The pole-flying in particular should, during the coming autumn and winter season, make a special appeal to Air Scouts, A.T.C., and similar organisations and clubs. So also should the " Solids " Competitions, especially as the Juniors have a special chance for themselves, free from a possible " inferiority complex " of competing against the more experienced Seniors; although I must confess that, from my own observations, very many of our younger " solids " enthusiasts can more than hold their own in open competitions! Well, here's *their* chance!!

Flying scale models have always been heavily overshadowed by Duration flying, and this has, in my humble opinion, been one of the tragedies of the development of the hobby—everything has been prostituted to duration, and the man or youth who was craftsman enough to put skill into the construction and finish of his model was very frequently left at the post by competitors whose sole aim was the longest duration obtained by means of a model constructed with the minimum amount of constructional skill and energy. The A.B.A. Competitions for Flying Scale Models are intended to overcome this, and although decentralised competitions do not lend themselves to close observation of constructional merit, it will not always be so, and in the not too distant future the man who is a painstaking and enterprising craftsman will reap his reward.

The ban on power model flying in the South, coupled with sparseness of essential supplies and engines, rather cramps the power plane enthusiast, but any modeller who aspires to flying a power-driven model should be sufficiently experienced to design himself a suitable job, and so we offer the opportunity to all power model fans to design a large petrol plane, suitable for carrying

COMPETITIONS

RIPPON

REVIEWS THE ASSOCIATION'S INAUGURAL PROGRAMMES

a radio receiving set and control apparatus. The Competition *does not* include designing the radio control gear. This competition should give our friends in the Services a good chance to join in, wherever they may be, and as it does not close until March 31st, 1945, they should all find time to " have a go." This applies also to a similar competition for power driven flying scale models. What a wide field of experiment and research offers itself here, and what beautiful designs could be produced ?

Incidentally, the rules for Class B of Competition No. 4—a Power Driven Model design—have been slightly modified. Originally the scale was *either* 1" *or* 2" to the foot ; and engines capacity was limited to 7·5 c.c. To allow for greater scope, the scale may be *anything between* 1" and 2" to the foot, and the engine's capacity has been increased to a maximum of 10 c.c.

Motive power plants of all types must be encouraged, and Competition No. 5 gives members with engineering skill and ability full opportunities to exploit some of their enterprising ideas, and this Competition too should prove attractive to other members of our modelling fraternity who, whilst not especially interested in model aircraft, see a future in the development of power plants to drive them.

I, personally, believe that compressed air as a motive power is due for a " come-back," and as it has the merit of being simple and cheap to maintain, and as the power run of any mechanically driven model is limited by Air Ministry instructions and regulations, this simple form of power offers great inducement to designers to get down to modern ideas. Electricity, too, as we have noted in the last year or two, has possibilities, and although the free flying of electrically driven models appears somewhat elusive, like the Philosophers' Stone, there are definite indications that before long it will be an accomplished fact. And who isn't interested in jet or reaction propulsion ?—even if it's only in doodle-dodging ! If rumour is to be believed the reaction unit on the doodle-bugs is of such simple construction that the principle could easily be adapted to model planes—or could it ? However, here is the chance to prove whether or not it is a fallacy, and perhaps win £20 and hold a handsome trophy for a year.

Necessity being the mother of invention, glider design has made good progress since rubber and petrol engines have been on the stop list, but I'm sure that under the spur of handsome prizes greater interest and progress can be made. Methods of launching gliders and sailplanes are by no means conclusive, and in order to focus attention upon the improvements that may be possible in launching gears, a substantial prize is offered for the best contribution to launching technique and apparatus.

Seaplanes and Flying Boats have not received the attention of competition organisers in the past that their potentialities warrant, particularly flying boats. It is felt by the A.B.A. Council that this type of model presents great possibilities, both as a spectacle and as a fruitful ground for interesting research. The difficulty of finding a suitable sheet of water to fly from and alight upon, in the case of water models, will doubtless be overcome by any serious and enterprising competitor, and I'm sure that most fascinating results will accrue.

Again, in the case of Experimental Models, the Council feel that here is a clear case for the greatest encouragement, and accordingly the prizes in Class No. 8 have been framed to this end. Those of us close to the heart of the movement frequently hear of bright ideas that seem to need but the incentive of a sensible prize to get its inventor moving in the right direction. A.B.A. intends to offer the utmost encouragement to those who are able and willing to expand their ideas. I trust that many of my readers will feel compelled to join A.B.A. and play their part in the expansion of the movement, remembering all the time, that the movement is like a jewel with many facets, each of which is as important as its fellows, but that it's *the whole* that makes for the complete beauty of the gem. In this simple analogy lies the principle behind A.B.A., which all level-headed folk understand. An unbalanced jewel would please no one, but a perfect specimen is a thing of beauty and a joy for ever!

In the A.B.A. Competitions you can see the essence of the analogy. If any section of the aeromodelling community has been overlooked, let us hear of it and the A.B.A. Council will be pleased to consider its claims.

CASH PRIZES TO THE VALUE OF £400

COMPETITION No. 5

MOTIVE POWER PLANTS OF ANY TYPE OTHER THAN RUBBER

2 classes. Total prize money £70 and silver trophies for the winners of first prizes.

COMPETITION No. 6

SAILPLANES

3 classes. Total prize money £25 and silver trophies for the winners of first prizes.

COMPETITION No. 7

RUBBER-DRIVEN SEAPLANES AND FLYING BOATS

2 classes. Total prize money £20 and silver trophies for the winners of first prizes.

COMPETITION No. 8

EXPERIMENTAL MODELS

1 class. Total prize money £35 and silver trophies for the winners of first prizes.

CLOSING DATE FOR ALL OF THESE COMPETITIONS IS MARCH 31st, 1945

All silver trophies have been donated to the Association for Annual Competition and will be held by winners each year.

Every one of these competitions is "open", *i.e.* you need not belong to the A.B.A. or any other society club group, etc. to enter these National Competitions.

BRITISH AEROMODELLERS
LONDON, W.1

THE D.H. 90 DRAGONFLY

BY E · J · RIDING

Photos: A. J. Jackson.

DESIGNED in 1935, the "Dragonfly" was intended to satisfy the demand for a multi-seat private owner's touring machine, but by 1939, most of those in service were owned by feeder line and charter firms. There was seating accommodation for five persons including the pilot—one passenger beside the pilot, one in a single seat directly behind them and the remaining two on a double seat at the back of the cabin.

Similar in appearance to its predecessor the D.H. 89 "Dragon Rapide," the 90 differed from usual D.H. practice in fuselage construction, for instead of the familiar spruce and plywood box structure, a monocoque shell of pre-formed ply was used in conjunction with light longitudinal spruce stiffeners down the back and sides.

The wing construction was noteworthy in that the lower centre section was a cantilever affair deeper in section than the remaining portions which, in conjunction with the outward splayed interplane struts made it possible to eliminate any wire bracing in the inner bays, giving a free approach to the cabin as well as a very clean appearance.

The outer wing bays were braced with close-spaced single pairs of life and flying wires and as will be seen from the photographs, the inner pairs of interplane struts are in the form of two inverted vees, the apices of which are anchored on either side to a wing drag member and not directly on to the spars as in the normal manner. The outer "I" struts are mounted in the same way.

Each undercarriage unit consisting of a low pressure airwheel carried between a pair of Turner oleo legs is clamped on to the lower centre section spar, the welded steel tubular engine mounting providing a rigid bracing against backward loads.

The engines fitted were two 130 h.p. 4-cylinder in-line aircooled De Havilland "Gipsy Majors."

Fuel was carried in two 30-gallon tanks in the lower centre plane and a further one of 25 gallons capacity beneath the rear passenger seats.

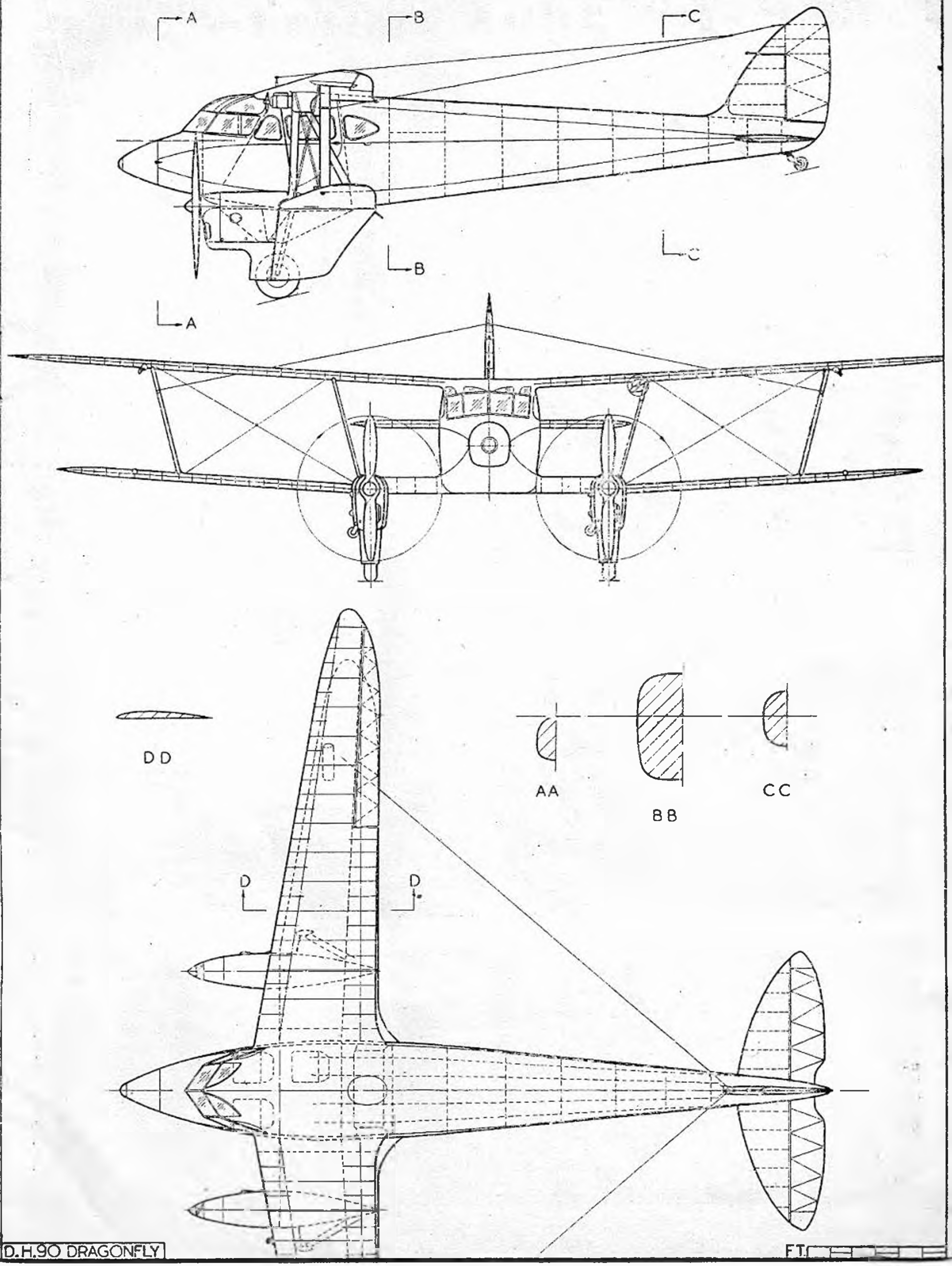
The range at cruising speed was 885 miles with this tankage.

As mentioned above, the D.H. 90 was used mainly for charter work. Anglo-European Airways, Ltd., of Croydon, operated three of these machines—G-AFRF, G-AFRI and G-AEDK. Air Despatch, Ltd., had two—G-AEDJ and G-AECX; and a machine owned by the late Sir Philip Sassoon was registered G-AEDT. Other matches were registered G-AEDG-K and G-AEDT-W inclusive.

Colour schemes were many and varied according to the customer's taste. One machine, G-AEDH, seen at Croydon in 1936, had a cream-coloured fuselage, black letters and silver wings.

About 56 "Dragonflies" had been built up to 1940. 19 were registered in this country, the remainder being for overseas markets.

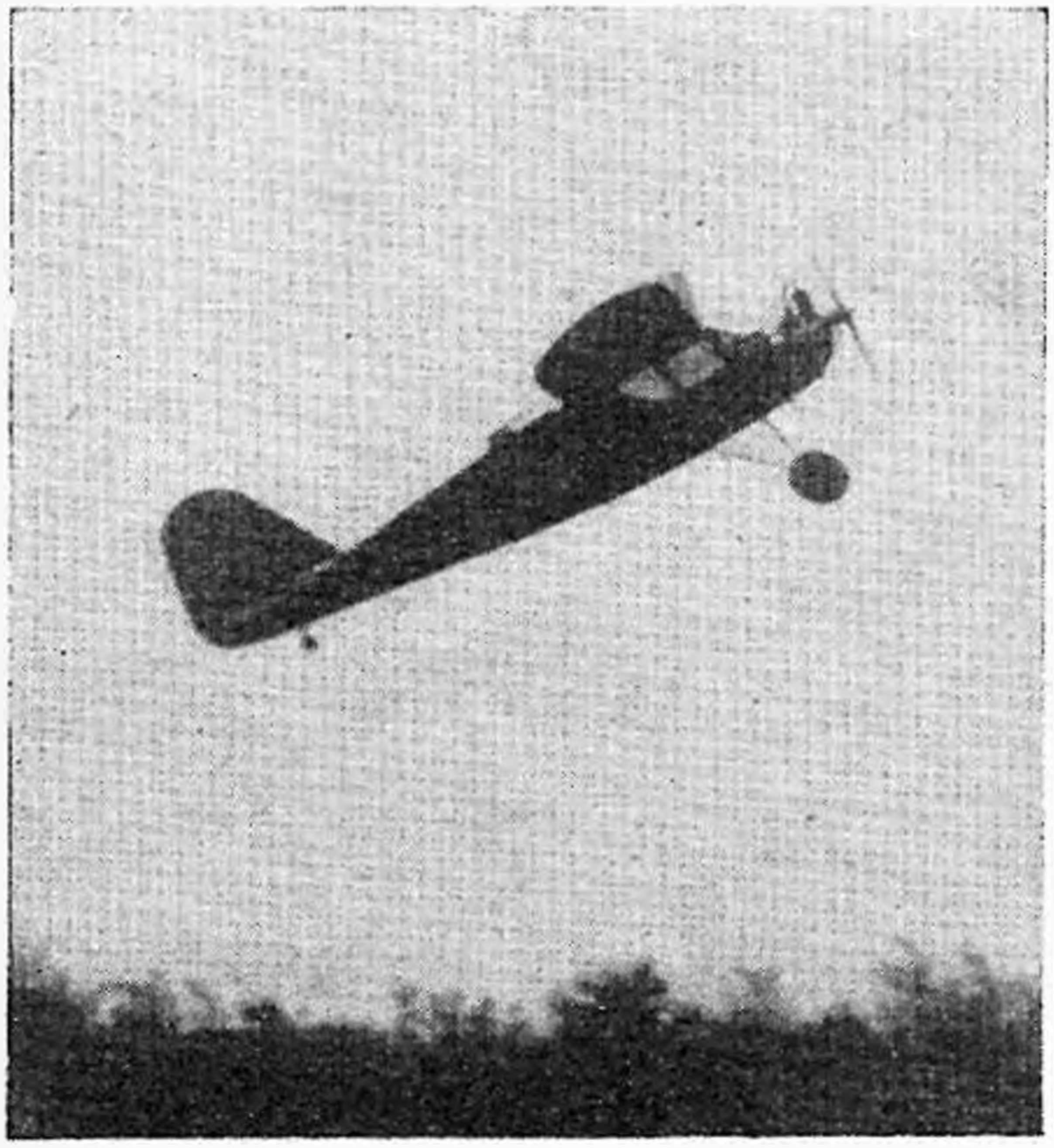
Specification: Span: upper, 43 ft. 0 in.; lower, 38 ft. 6 in.; length, 31 ft. 8 in.; height, 9 ft. 2 in.; weight: empty, 2,490 lb.; loaded, 4,000 lb.; max. speed, 145 m.p.h.; cruising speed, 125 m.p.h.; landing speed, 65 m.p.h.; service ceiling, 16,000 ft.



D.H.90 DRAGONFLY

THE SIR JOHN SHELLY CUP

SUTTON PARK GOLF COURSE, BIRMINGHAM, SEPTEMBER, 3rd, 1944



THE fifth anniversary of the outbreak of this present War, with its resultant ban on the flying of power-driven aircraft, saw the first petrol model contest to be organised since the removal of restrictions. The meeting, held at Sutton Park Golf Course, brought with it a breath of peace-time pleasure yet to come; pleasure that we hope will not be marred, as at this meeting, by the inevitable crowd straying as always over the "take off" at risk to life and limb, not forgetting the competitors' models.

There were, of course, the usual motors! "It ran on the bench this morning. I can't understand why the damn thing won't run now!" S. G. Wyer of Cheam was dogged by this sort of trouble. Two and a half hours of perseverance, however, saw his motor splutter to life, and, taking off through the spectators, and narrowly missing H. Scarth with his modified "Comet II" on the way, he got off for his first flight. Wyer's next effort, one of the best of the day, came to an abrupt conclusion when the model went "birds' nesting" during the glide. This folded the wing in half, exposing a main spar made of *soft balsa!*

As always, there was the camera-man hotly pursued by a model that turned left in spite of the owner's assurance that it was set for right-hand circles. In this case it was the AEROMODELLER camera-man who suffered, and the results on the exposed plate were quite surrealistic!

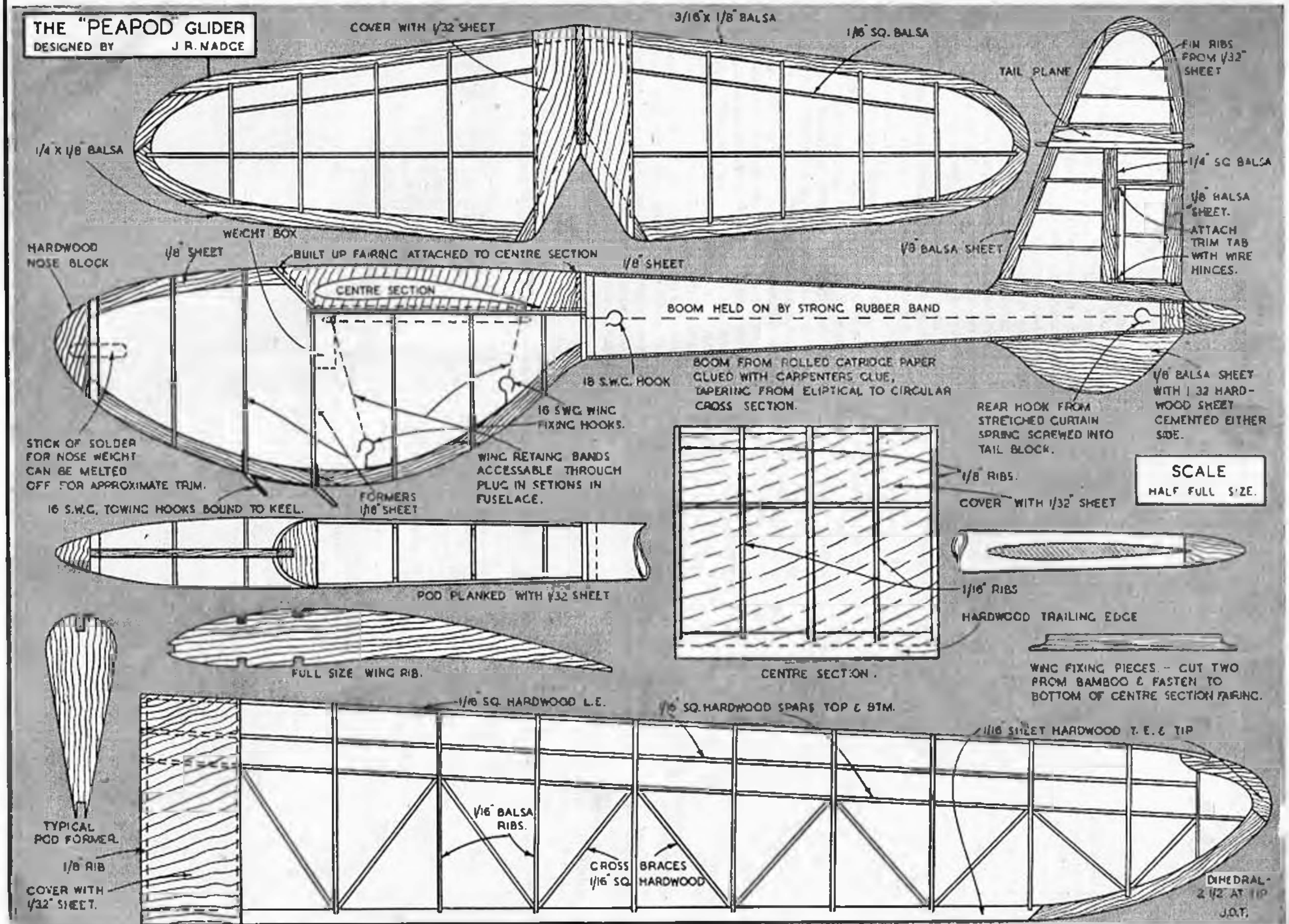
Continued on page 573.

Above is S. Silvio's 5 ft. 6 ins. span "Indian Chief" climbing steeply on one of its winning flights.

Below shows Silvio himself starting up assisted by Trevor London.

Bottom left—a Gaumont British cameraman "shoots" members of the Bradford Club whilst they are "running up."
Bottom right—H. Scarth makes some last-minute adjustments for A. Cripps prior to take off.
Below is H. Scarth's modified Comet II climbing steadily.

"Aeromodeller" Photo.


THE "PEAPOD" GLIDER
DESIGNED BY J.R. NADGE
COVER WITH 1/32 SHEET
3/16 x 1/8 BALSA
1/16 SQ. BALSA
FIN RIBS FROM 1/32" SHEET
TAIL PLANE
1/4 X 1/8 BALSA
1/4" SQ BALSA
1/8" BALSA SHEET.
ATTACH TRIM TAB WITH WIRE HINGES.
WEIGHT BOX
HARDWOOD NOSE BLOCK
1/8" SHEET
BUILT UP FAIRING ATTACHED TO CENTRE SECTION
1/8 BALSA SHEET
1/8" SHEET
CENTRE SECTION
BOOM HELD ON BY STRONG RUBBER BAND
18 S.W.G. HOOK
BOOM FROM ROLLED CATRIDGE PAPER GLUED WITH CARPENTERS GLUE, TAPERING FROM ELIPTICAL TO CIRCULAR CROSS SECTION.
16 SWG WING FIXING HOOKS.
REAR HOOK FROM STRETCHED CURTAIN SPRING SCREWED INTO TAIL BLOCK.
1/8" BALSA SHEET WITH 1/32 HARD-WOOD SHEET CEMENTED EITHER SIDE.
STICK OF SOLDER FOR NOSE WEIGHT CAN BE MELTED OFF FOR APPROXIMATE TRIM.
WING RETAING BANDS ACCESSABLE THROUGH PLUG IN SETIONS IN FUSELAGE.
FORMERS 1/16" SHEET
1/8" RIBS.
SCALE HALF FULL SIZE.
COVER WITH 1/32" SHEET
16 S.W.G. TOWING HOOKS BOUND TO KEEL.
POD PLANKED WITH 1/32 SHEET
1/16" RIBS
HARDWOOD TRAILING EDGE
FULL SIZE WING RIB.
CENTRE SECTION.
WING FIXING PIECES. - CUT TWO FROM BAMBOO & FASTEN TO BOTTOM OF CENTRE SECTION FAIRING.
1/16 SQ. HARDWOOD L.E.
1/16 SQ. HARDWOOD SPARS TOP & BTM.
1/16 SHEET HARDWOOD T. E. & TIP
TYPICAL POD FORMER.
1/8 RIB
COVER WITH 1/32" SHEET.
1/16" BALSA RIBS.
CROSS BRACES 1/16" SQ. HARDWOOD
DIHEDRAL-2 1/2 AT TIP
J.D.T.

CONTACT BREAKER DESIGN

BY A J EDMUNDS

ACKNOWLEDGEMENTS must be made to the articles by Colonel Bowden and Dr. Forster in the March issue of the AEROMODELLER which acted as the inspiration for this design. While agreeing with Dr. Forster as regards the necessity of keeping the contact breaker points clear of oil, it appears to me that his suggested design has two drawbacks from the point of view of the average model maker. First of all the arm carrying the moving contact would appear to lack rigidity and, secondly, the structure of the whole would not be easy to make. The following design has been produced in an attempt to overcome these two objections.

The first essential in simplicity of construction is to eliminate the need for castings of any sort. As will be seen from the sketches, the materials required are of the simplest. First of all a piece of sheet aluminium 16 s.w.g., approximately ¾ in. by 2 ins. This forms the clamp (A) which fits round the main-bearing housing and carries the pivot for the moving contact and the insulated block for the fixed contact. The rocker arm (C) is made from 22 s.w.g. brass sheet folded to form a U section. The mounting for the fixed contact is a piece of bakelite approximately ¼ in. square by ¾ in. long (B). The return spring (E) is simply a piece of phosphor-bronze strip, the dimensions of which will have to be found by experiment. Finally, the contact points (F) are car magneto points purchased from the local garage.

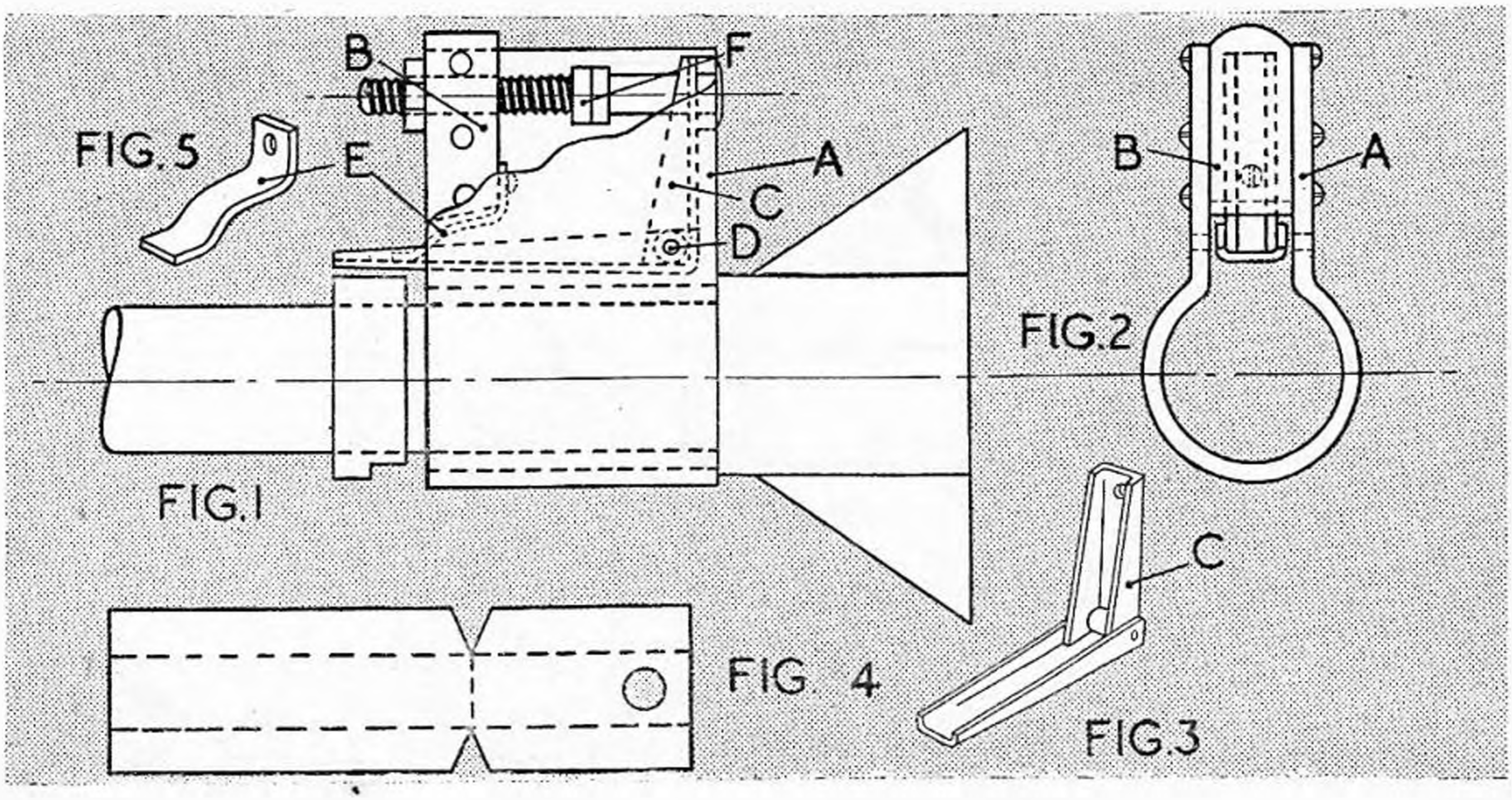
Fig. 1 shows the general arrangement of my original model, which is intended for use of a Hallam 10 cc. engine. It will, of course, be obvious that the design can readily be changed in detail to suit almost any type of engine.

Fig. 2 shows the assembly viewed from the front, the screws holding the bakelite piece B are 10 B.A.; the contact points which I used had 4 B.A. thread.

Fig. 3 shows the rocker arm, which is constructed from a piece of brass sheet cut to the shape shown in Fig. 4, the sides are folded up first to form the U section and then the V slots cut and the U section bent at right angles, then a brass bush of suitable dimensions is inserted in the angle and the whole lot soldered together. Next, a hole is drilled right through the bush at a point suitable for the 6 B.A. steel pivot pin (D). The only other point requiring any elaboration is the drilling of the hole which carries the moving contact point; great care should be taken to get this exactly in line with the hole in bakelite piece B which carries the fixed contact. Fig. 5 showing the spring illustrates what seems to be the correct design but the question of strength still remains to be decided after more elaborate tests under running conditions.

Returning for a moment to Dr. Forster's article on this same subject, it occurs to me that perhaps it is not made sufficiently clear why any contact breaker must be kept clean to give satisfactory results. In most ignition coils the resistance of the primary winding is about ·5 ohm, and since the circuit is subject to the well-known Ohms law it becomes apparent that any added resistance in the circuit will have a very serious effect on the current available in the primary winding, for example, even ·1 ohm contact resistance represents 20 per cent. added to the original resistance of the low-tension circuit. I have tested various contact breakers on commercial engines and have yet to find one where the contact resistance is less than ·015 ohm. With the above design, using the car magneto points which have a large contact area, and taking great care to see that they bed down squarely, I have succeeded in reducing the contact resistance to ·005 ohm. This may appear a trifling gain, but in practice it makes starting easier.

Summing up, this design can be seen to have the essential feature of keeping the contacts away from oil, to be easily adjustable, to need only a few simple materials, and, finally, to be readily adaptable to existing engines without even the necessity of making a new cam.



THE REPUBLIC P-47 THUNDERBOLT

BY I A F HALLS

LARGE numbers of Thunderbolt fighters are in service in this country and have earned high praise from the pilots flying them. Thunderbolts form the mainstay of the U.S.A.A.F. in Britain, and, together with Mustangs and Lightnings, are often seen escorting formations of Fortresses and Liberators.

The Thunderbolt is of all-metal construction, the fuselage being a monocoque structure with light alloy stressed-skin covering. The wings and tail unit are covered with stressed-skin, with fabric over the movable control surfaces. A four-bladed Curtiss electric constant-speed airscrew is fitted and is driven by a 2,000-h.p. Pratt & Whitney Double-Wasp eighteen-cylinder radial motor.

The following dimensions have just been received from the manufacturers, and it will be noted that the length is considerably greater than the figure quoted earlier: span, 40 ft. 9 5/16 in.; length, 35 ft. 5 3/16 in.

Thunderbolts carry the usual drab camouflage on the sides and upper surfaces, while the undersides are light grey. The national marking is carried on each side of the fuselage and usually above and below *both* wing tips. In common with other U.S. types, Thunderbolts are now appearing in their original metal finish.

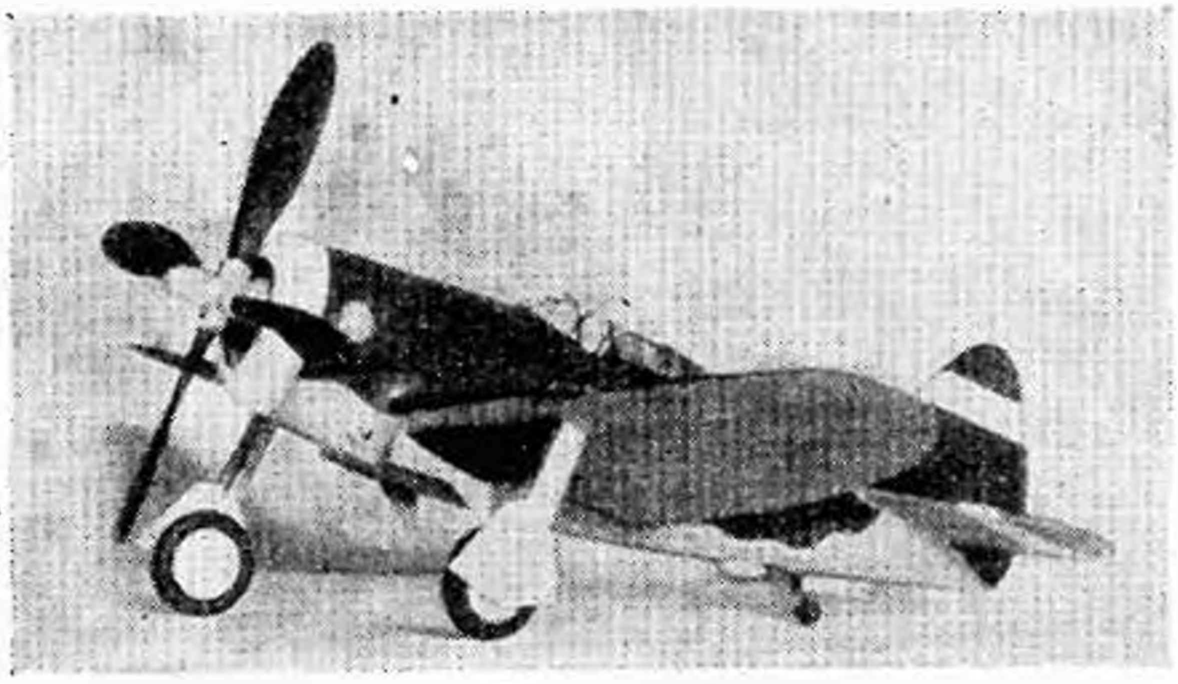
CONSTRUCTION.

Fuselage. Cut keels from 1/16 in. sheet substitute, cut half formers from 1/16 in. sheet balsa. Pin keels on the plan, cement on left half formers, add stringers. The rear motor peg fixing is from 1/16 in. sheet, grain running vertically. (Check formers at right angles to keel.) When set remove from plan, add right half formers and stringers. Next build the cowling, cement to fuselage. Add 3a and 4b and wire hoops for cabin framework. Cement on a rib A from 1/16 in. sheet on each side of the fuselage.

Wings. All ribs from 1/16 in. sheet. Pin the spar on the plan (the spar may either be built up or the outline cut from 1/16 in. sheet). The overlap should only be built on to the left-hand spar and then only if the wings are to be rigidly fixed. Pin T.E. on the plan and cement rear half ribs in position. Remove from plan, add front part of rib A and *smallest rib*, add L.E. and wing tip. Then add rest of front ribs. Sandpaper to streamline shape, add U.C. block and gussets. Fill in space on top of spar between front and rear portion of ribs with a piece of balsa scrap. (Theoretically this should be 1/16 in cube.) If wings are to be detachable, dowels are added extending to the third rib. These dowels fit into rolled paper tubes cemented into the centre section.

Tail Unit. The tailplanes and the rudder outline are built direct on the plan and the rudder framework fitted in after removing the outline from the plan. R is 3/16 in by 1/16 in. tapered to 1/16 in. square.

Propeller. Cut two blanks, from white pine or a similar hardwood, carve to a rough finish. Sandpaper and approximately balance each blank. Interlock the two blanks at right angles (make sure the pitch is the same on both), finish off the blades. Round off the roots of the blades and balance, add the "spinner" (preferably turned on a lathe). The prop. shaft is 18 S.W.G. The shaft passes through an aluminium or brass tube bearing in the dummy crankcase.



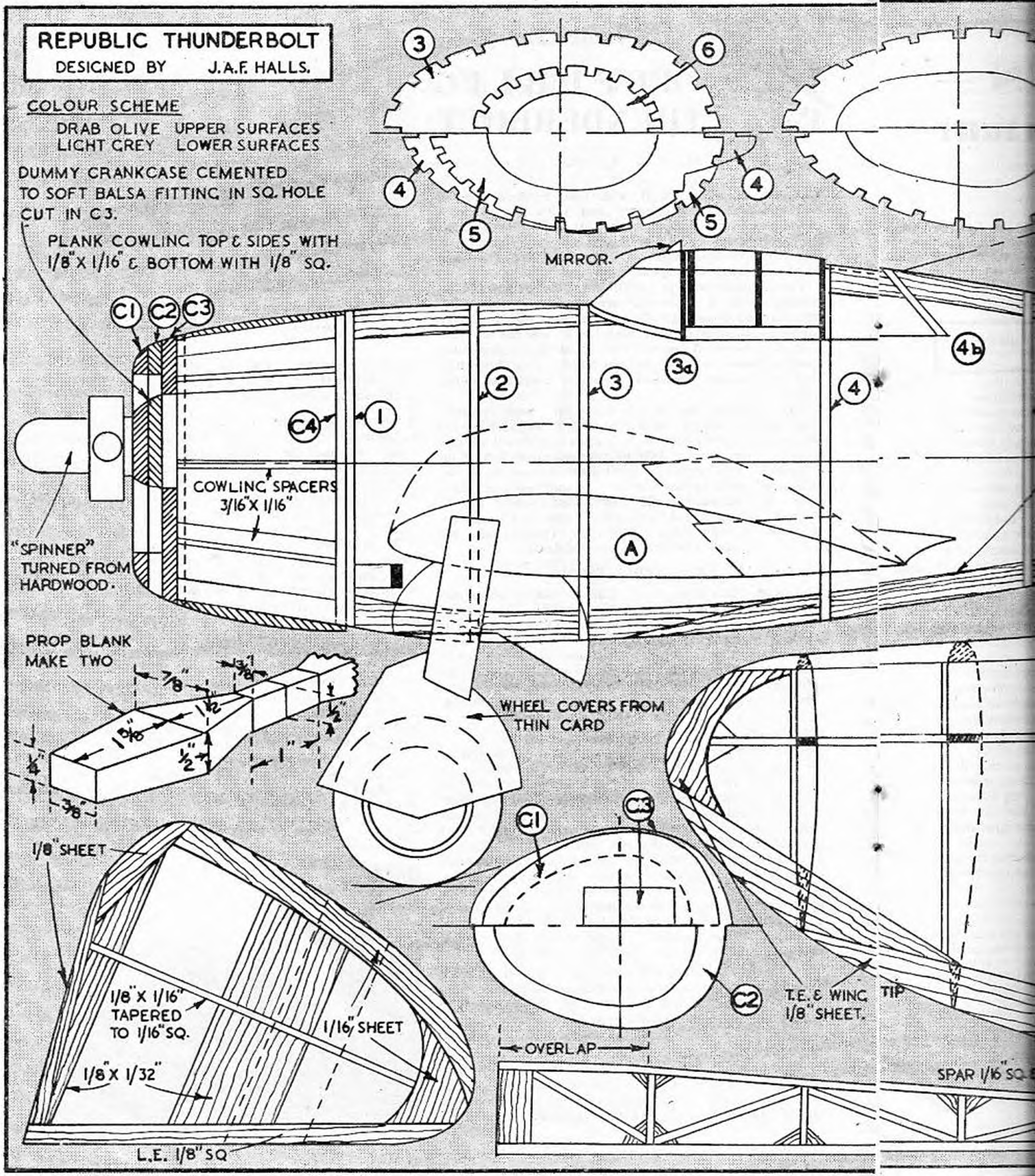
The flying scale model above is a "good-looker" and compares very favourably with the full-sized machine below. Full size detailed plans are to be found overleaf.

Assembly. Cement on rudder and tailplanes. The tailplane is at 0° incidence. Arrange the fuselage in a "jig" so that the rudder is vertical and the datum line of rib A is horizontal. If the wings are to be fixed permanently, cement on the right wing first, then the left wing with the spar overlap cross-braced to the right-hand rib A and formers 2 and 3. The wing tip is 1¾ in. higher than the bottom of the fuselage. Fillet is 1/32 in. sheet. Cover the whole model with white tissue. Dope upper surfaces drab olive and under surfaces grey, joining line is wavy (with the exception of the white recognition band on the cowling).

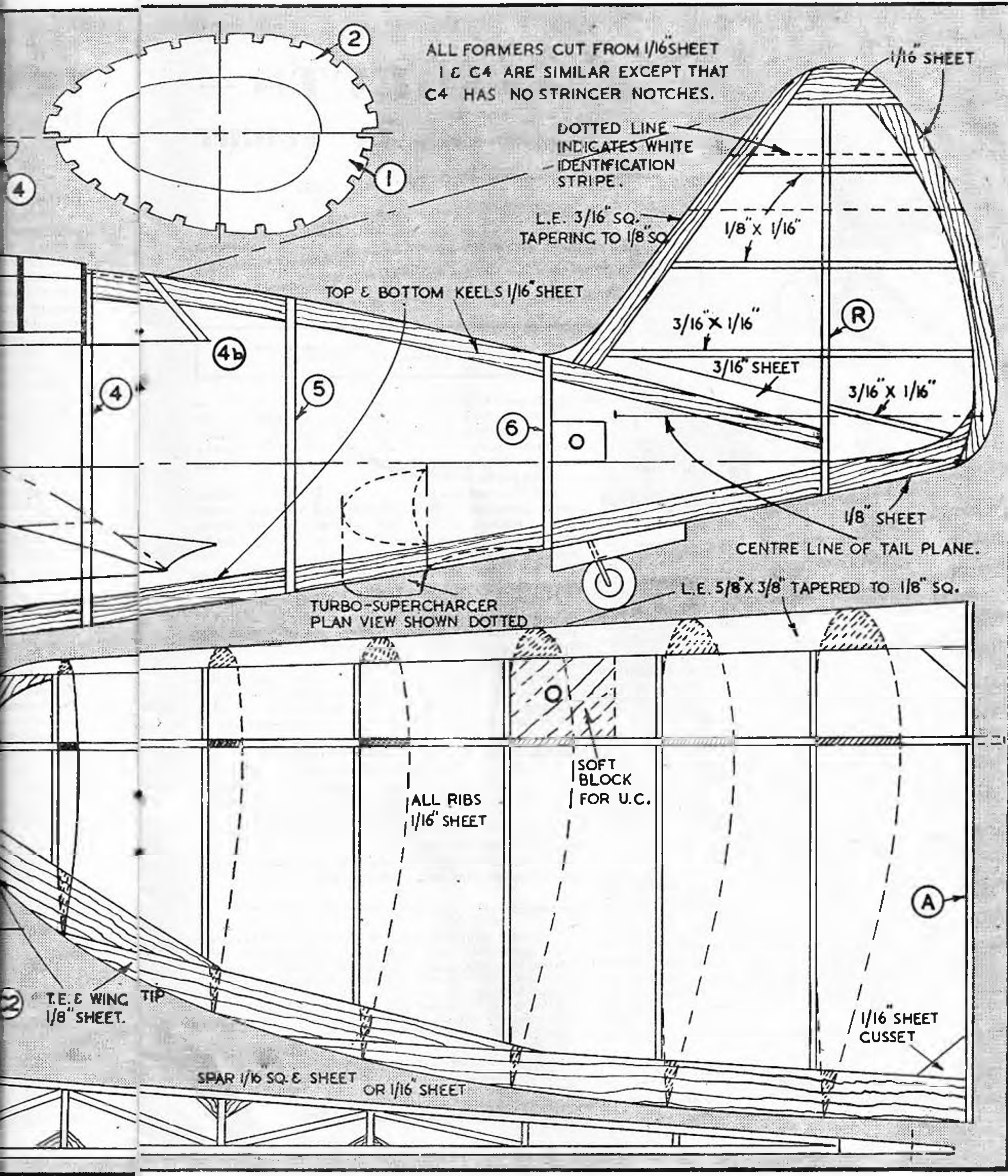
The guns are 1/16 in. round dowel. Cement on the Turbo-Supercharger (carve from soft balsa). The U.C. main leg is 3/16 in. round bamboo; a piece of 18 S.W.G. is bound on to the end to take the wheel. The other end fits into a short length of brass tube sunk and glued into the U.C. block in the wing. The cover plates are cemented to the bamboo leg and the whole unit is detachable. The tailwheel unit complete with cover plates is also detachable, plugging into aluminium tubing cemented to the keel and adjoining stringers.

With a good strong prop., strong L.E. and detachable U.C. unit this model will take plenty of knocks, so don't be afraid of treating it rough. The power is 8–10 strands of ⅛ in. flat rubber. The length of each strand is 12 in. and the motor is lubricated and pretensioned before flying.

Fox Photos



REPUBLIC THUNDERBOLT
DESIGNED BY J.A.F. HALLS.
COLOUR SCHEME
DRAB OLIVE UPPER SURFACES
LIGHT GREY LOWER SURFACES
DUMMY CRANKCASE CEMENTED TO SOFT BALSA FITTING IN SQ. HOLE CUT IN C3.
PLANK COWLING TOP & SIDES WITH 1/8" X 1/16" & BOTTOM WITH 1/8" SQ.
MIRROR.
C1
C2
C3
C4
1
2
3
3a
4
4b
5
6
A
COWLING SPACERS 3/16" X 1/16"
"SPINNER" TURNED FROM HARDWOOD.
PROP BLANK MAKE TWO
7/8"
13/16"
1/2"
1"
1/4"
3/8"
WHEEL COVERS FROM THIN CARD
1/8" SHEET
1/8" X 1/16" TAPERED TO 1/16" SQ.
1/16" SHEET
1/8" X 1/32"
L.E. 1/8" SQ
T.E. & WING TIP 1/8" SHEET.
OVERLAP
SPAR 1/16" SQ.



ALL FORMERS CUT FROM 1/16" SHEET
1 & C4 ARE SIMILAR EXCEPT THAT
C4 HAS NO STRINGER NOTCHES.
2
1
4
1/16" SHEET
DOTTED LINE INDICATES WHITE IDENTIFICATION STRIPE.
L.E. 3/16" SQ. TAPERING TO 1/8" SQ.
1/8" X 1/16"
TOP & BOTTOM KEELS 1/16" SHEET
4b
4
5
R
3/16" X 1/16"
3/16" SHEET
3/16" X 1/16"
6
1/8" SHEET
CENTRE LINE OF TAIL PLANE.
L.E. 5/8" X 3/8" TAPERED TO 1/8" SQ.
TURBO-SUPERCHARGER PLAN VIEW SHOWN DOTTED
SOFT BLOCK FOR U.C.
ALL RIBS 1/16" SHEET
A
T.E. & WING TIP 1/8" SHEET.
1/16" SHEET GUSSET
SPAR 1/16 SQ. & SHEET OR 1/16" SHEET

— INSECTS —
MASTERS OF FLIGHT

BY FRANK W · LANE

"There is no question that, from a scientific and research point of view, bird *and insect* flight have been sadly neglected; and that there is undoubtedly much yet to be learnt from both of the way air behaves when flowing over various shaped bodies."—Capt. J. Laurence Pritchard, Secretary of the Royal Aeronautical Society. (My italics. F. W. L.)

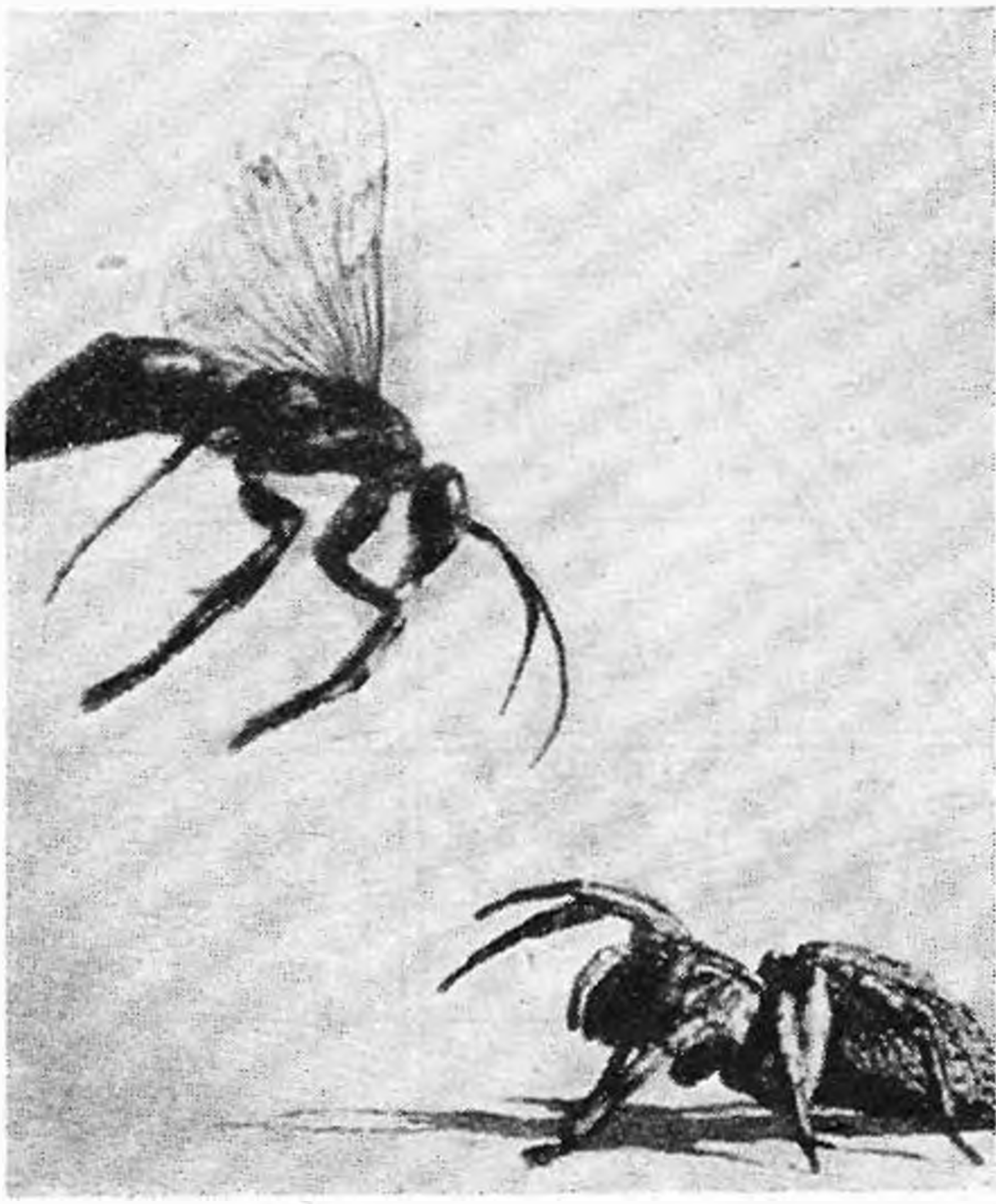


Photo by Otto Scheerpelts

Left, an insect dive-bomber! A wasp attacks a spider Taken with an exposure of 1/1,000th sec.

Insect flight has received only a fraction of the attention which has been bestowed upon the flight of birds. For one book or article which has been written on the aerodynamics of insect flight probably ten, if not more, have been written about avian aerodynamics. Yet the insect world has as interesting a variety of flight methods as the birds' and the action of the four wings of some insects has a greater affinity to that of an airscrew than the wing action of birds. (I omit from this comparison the humming-bird, whose flight has been well described as being like that of an overgrown insect.)

It is not without significance that there was published some two years ago in a German technical journal a long article by two research workers who had been studying the mechanism of insect flight; even to the extent of constructing flying models of some insects. A tantalising reference in this paper to "some experiments about which we are not at liberty to speak" makes one wonder whether the improved machines our pilots are now meeting over Europe may owe something to this close study of insect aerodynamics.

The wings of the most expert-flying insects are beautifully adapted for flight. They are extremely light (the four wings of a drone bee weigh only half a milligramme) yet very rigid. I do not wonder it has been said that if the material of which insects' wings are composed could be made synthetically it would prove very valuable in aircraft construction. I imagine the same applies even more to model aircraft construction.

The front half of an insect's wing is of greater rigidity than the rear half. Such an arrangement, which is essential for forward flight, also enables the wings to be neatly tucked away when not in use.

In some insects (Diptera—mosquitoes, gnats, etc.) the second pair of wings is modified into a pair of dumb-bell shaped organs. They appear to act as stabilisers or, as one worker phrased it, "alternating gyroscopes."* These organs, which are known as halteres, are inclined backwards on each side at an angle of about sixty degrees to the long axis of the body. When flies were deprived of their halteres they showed a complete loss of control in the air and frequently fell on their backs.

The German research workers, referred to earlier, direct attention to the tiny growths, easily seen under the microscope, on the wings of insects. Referring to air turbulence about the wings they say that this can be checked by creating turbulence in the boundary layer. This can be done artificially by a thin wire in front of, or above, the leading edge.

Turning to insects, the workers found that insects have just such a device in the form of bristles, teeth and similar formations. In some species of insects the bristles are confined to just that edge of the wing which acts as an effective lifting surface.

An insect, no more than a bird, does not merely flap its wings up and down. They go through a complicated movement which is like a figure 8, although, of course, the actual path varies considerably with different species. The wings of a butterfly, for example, describe a different path to those of a dragon-† or damsel-fly.

Experiments have proved that an insect's wings draw air not only from in front but also from above, from the sides and from below. In the case of a bee there are grooves on the wings which prevent the air from escaping around the wing plane during the downstroke and drive it towards the rear.

L. Bull, from a special study of insects during the first few moments after taking off, considers that it is not by

* "During flight each haltere is vibrating rapidly in a plane which is fixed relative to the body of the fly. Every quickly rotating body sets up gyroscopic forces. It tends to maintain the plane of rotation and to resist every deviation from this plane. Although the haltere is not in the strict sense a rotating body, by its swinging to and fro through an arc of ninety degrees it must be regarded as an alternating gyroscope."—G. Fraenkel in "Proc. Zool. Socy." May, 1939.

† "It is an interesting fact, from an aerodynamic point of view, that when a dragon-fly's wings were bisected along the long axis, its flight was scarcely impaired. When the wings were bisected along the short axis the insect was not able to fly."—Gordon Aymar in "Bird Flight."

the rapidity of the wing-beat that the insect regulates its speed but by "changing the angle of the wing and probably to a certain extent by varying the amplitude of the movement and the direction of the trajectory of the wings." Bull also found that the tips of certain damsel-flies' wings move at 5·5 m.p.h. at the beginning of their flight. Working with the larger dragon-fly, Leigh Chadwick obtained a maximum wing-tip speed of some 8 m.p.h., which is higher than that obtained for birds (again excepting the humming-bird with its wing frequency of between 50 and 70 beats per second).

The wing-muscles responsible for driving the wings are, in some insects, very powerful. In the robber fly they weigh about one-third of the insect's total weight.

With such "motors" to drive their highly efficient wings it is not surprising that some insects are very powerful when on the wing. F. S. J. Hollick, who conducted experiments with the dipterous fly *Muscina stabulans* in a miniature wing-tunnel, says that they maintained wing-movements in which the magnitude of the force generated was equal to or in excess of the weight of the insect.

In America some aeromodellers have actually powered their machines with living insects. Sometimes two flies were attached to a tiny aeroplane. One fly made a record flight of three minutes and then landed its aeroplane on the ceiling!

A butterfly collector once had another illustration of the powerful flight of an insect when a large hawk moth blundered through an open door into a room where he was mounting some specimens by candlelight. The moth hit the candle with such force that it knocked it out of its stand. But even this incident is not so startling as the case of a man who was driving a car one night when a large, thick-shelled beetle collided head-on with the windscreen. The impact was so great that the glass was shattered!

Even the most casual observer of insect life must have noticed the extremely high frequency of an insect's wing-beat. But it was not until ultra-high-speed cinematography and other technical apparatus was used on the problem that exact details, both of the action and frequency of the beat were obtained.

It used to be thought, and the idea still appears to be widely prevalent, that the speed of wing-beat can be gauged by the note given forth by the rapidly whirring wings. But the relation between the pitch of an insect's tone and the frequency of its wing motion is still not completely understood, and in many cases it appears likely that harmonics may be mistaken for the fundamental. But no such confusion arises when an insect's beating wings are "frozen" by the u-h-s camera and then the films are examined at leisure, the investigator knowing both the number of picture-frames employed and the time taken.

And here I must pay tribute to one of the most painstaking and ingenious men who ever devoted his talents to a laboratory study of animal locomotion. He was Prof. A. Magnan of the Collège de France. Magnan obtained film records of insects in flight taken at nearly 30,000 pictures per *second.* But apparently even this tremendous speed did not fully satisfy the Professor for, in his monumental work, *Le Vol des Insectes* (easily the most complete study of insect flight yet published), he says: "If it is possible for me to unroll the film not at five m. sec., as I actually did, but at fifteen m. sec., that will give 80,000 pictures a second."

Some representative speeds, obtained by Magnan and other workers, will be included in the table at the end of next month's article. It should, however, be pointed out that the frequency of wing-beat is rarely constant and varies under different conditions. In one insect which Magnan tested he found that its frequency varied between 48 and 72 beats a second. *(To be continued.)*

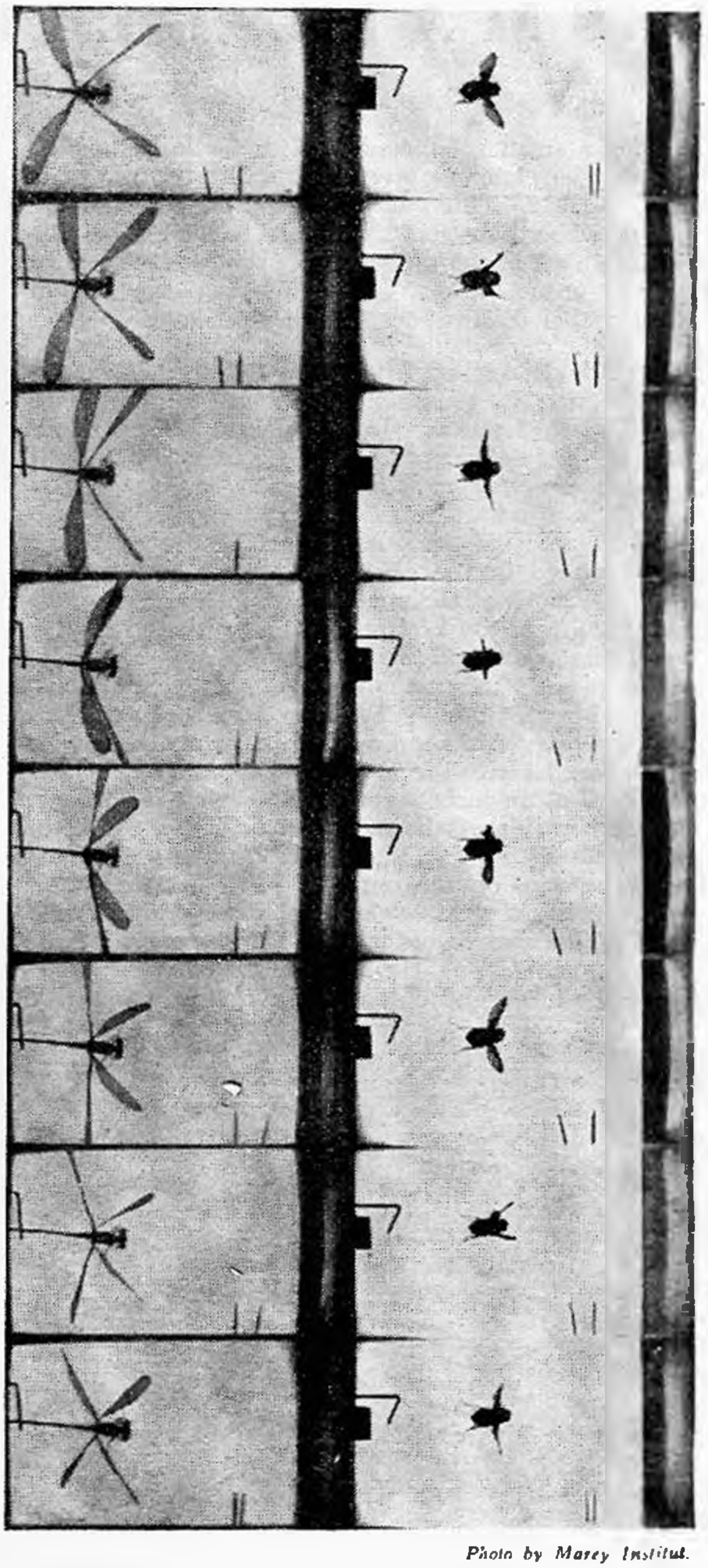


Photo by Marey Institut.

Photographs left show the wing beats of a Damsel Fly taken at a speed of 600 photos per sec., whilst those of the ordinary House Fly, right, were taken at 1,200 photos per sec. Note the vibrating tuning fork prongs, showing bottom right in each picture. They are beating at 50 double vibrations a sec. and give some indication of the speed at which the insects' wings are beating

A SMALL GLIDER RELEASE

By B. EDEN.

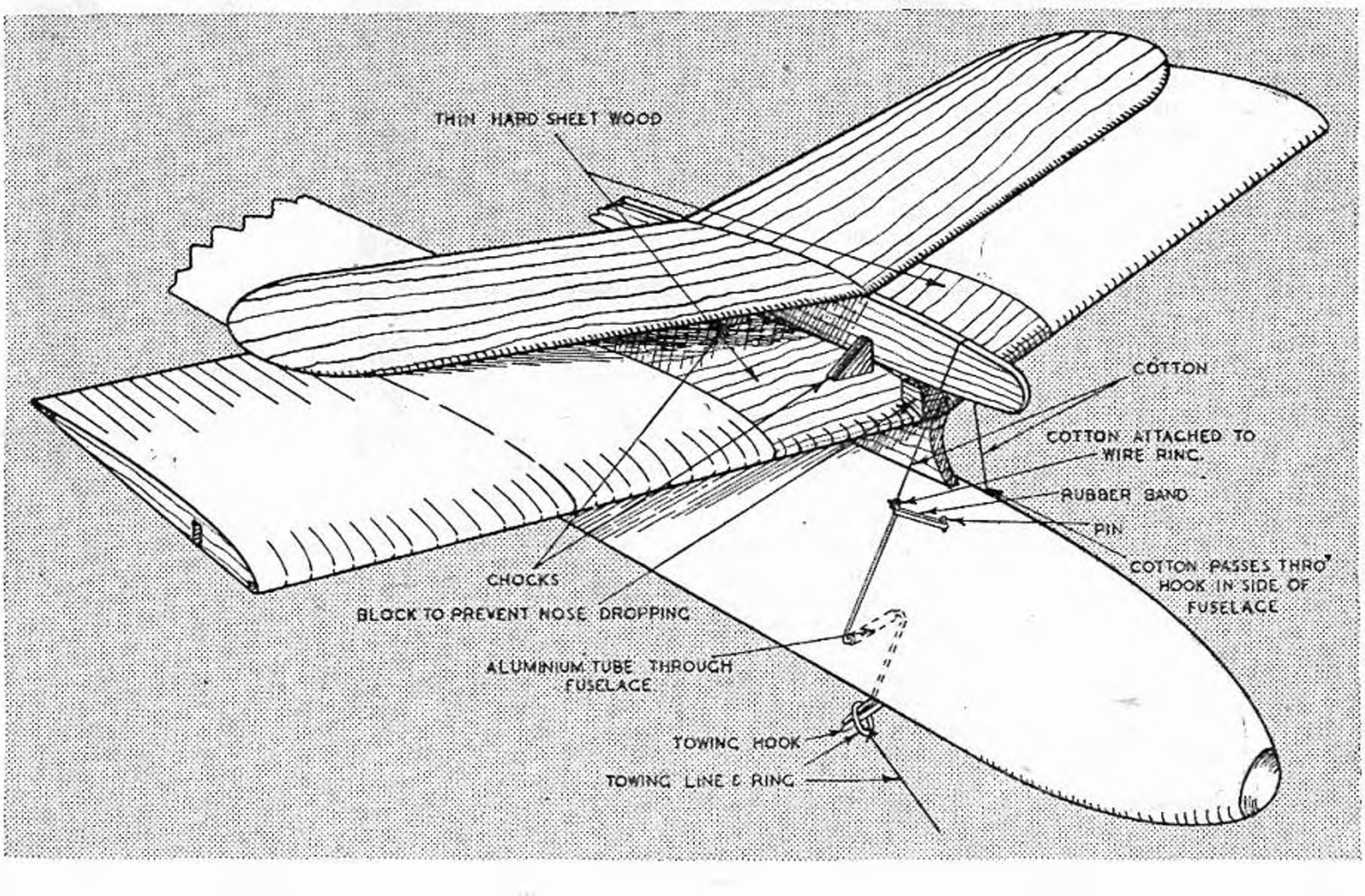
I MADE a small solid model glider for launching by hand. The plan was given in the AEROMODELLER of Christmas, 1942. This was quite good for hand launching, but when I tried to catapult it by one of the methods shown in the same issue of the AEROMODELLER it proved unsuccessful. I then hit upon the idea of launching this small glider from the back of a larger glider, the " Elite Airborne."

The method of construction is as follows: From the middle section to the first rib on either side of the upper surface of the wings of the larger glider I glued two pieces of thin hard sheet wood. On top of this it was necessary to fix four small triangular-shaped "chocks"; two on either side with a channel between to hold the body of the small glider. A small ⅜-in. sq. block is placed in the centre on the leading edge to prevent the nose of the small machine from dropping. About ⅜-in. from the keel and in line with the leading edge of the wing drill a hole through the body and insert a piece of aluminium tubing, cut flush. Push a piece of wire through the tube and bend it down flat to the body and bend again ¼-in. below and under the keel parallel with the tubing and to protrude behind and 1/10th of an inch beyond the towing hook. Now, on the other side of the body bend the wire directly upwards for 2⅓ in. flat to the body and in the same line as the wire on the opposite side. At this point bend the wire at right angles to the rear for ⅛-in. and cut off. The wire should now move freely backwards and forwards.

Place the lower end of the wire ⅛-in. away from the base of the towing hook towards the rear. Then a rubber band 1-in. long should be put over the hook at the top of the wire and fastened just taut with a pin towards the nose, making sure that the lower end of the wire is exactly ⅛-in. from the base of the towing hook.

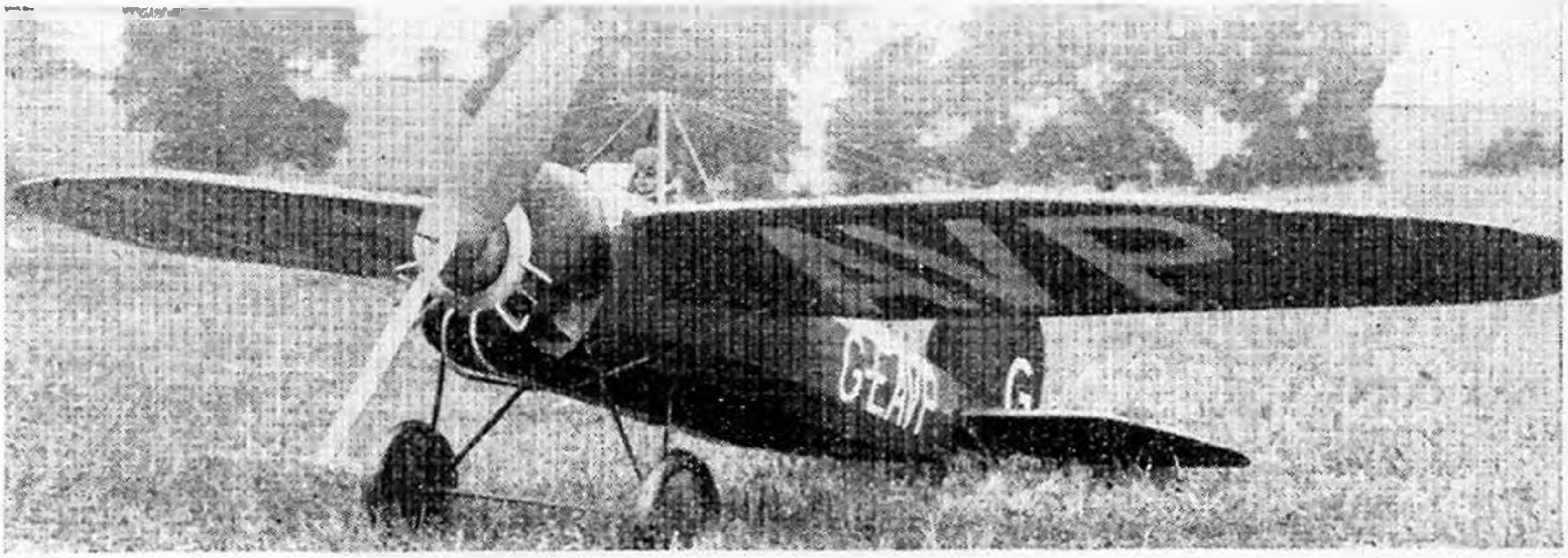
On the opposite side to the pin which secures the rubber band insert a wire loop in the wood ⅜-in. from the top of the body and exactly opposite the hook which the rubber band is placed) when the bottom of the wire is pressed forward against the towing hook. Tie a length of cotton about 18-ins. long to the wire loop. Place the small glider on top of the larger. Take the cotton over the nose of the small glider and now thread it through a small ring about ⅛-in. diameter which is placed over the hook on the wire near the rubber band. The cotton is again passed over the nose of the small glider and pulled tight through the wire loop and securely fastened, the surplus being cut off.

Place the small glider in position, then pull the thread over its nose and slip the ring on to the hook and set it finely, at the same time as the lower end of the wire is pressed against the automatic releasing tow hook. Put the tow rope ring over both the lower end of the wire and the towing hook. This will be kept in place by the tension of the tow rope. When the large glider gets to the point where it must be released from the tow rope the ring will slip off the towing hook and release the lower end of the automatic release, thus the rubber band will pull back the wire, the ring attached to the cotton will slip off the hook and the small glider will be launched on its flight.



$1\frac{1}{2}$ ins. to 1 ft. Flying Scale Model of THE BRISTOL 77 RACING MONOPLANE

BY E · J · RIDING



[Photo: E. J. Riding.

IN September, 1920, the Bristol Aeroplane Company, Ltd., registered an M.1D wire-braced shoulder-wing monoplane. This machine in its original form was known as the type M.1C or type 20 and was designed by the late Capt. F. S. Barnwell during 1915–16.

The Bristol monoplane was of remarkably modern appearance and was considered by pilots who flew it during the last war to be the best single-seater fighting scout of its time. It was, however, not put into regular squadron use and saw service mainly on the Eastern Front during 1916–17. About 130 machines were built and they were fitted with the 110 h.p. Le Rhone rotary 9-cylinder engine.

The 77 racer was similar in most respects to the original design but had been modified to take the Cosmos "Lucifer" 3-cylinder radial engine of 100 h.p., in which form it was entered and flown in most of the important race meetings held in this country between 1921 and 1923.

The machine was registered G-EAVP and during its somewhat brief career it managed to win the Whitsun Handicap race at Croydon in June, 1922, piloted by C. F. Unwins, and the Aerial Derby Handicap of the same year in the hands of the late L. L. Carter, at 109 m.p.h. It was also entered in the 1922 King's Cup race but was forced to retire after covering only a few miles. Its final appearance was in the Grosvenor Challenge Cup race held at Lympne on June 23rd, 1923, when it was flown by Maj. E. L. Foote.

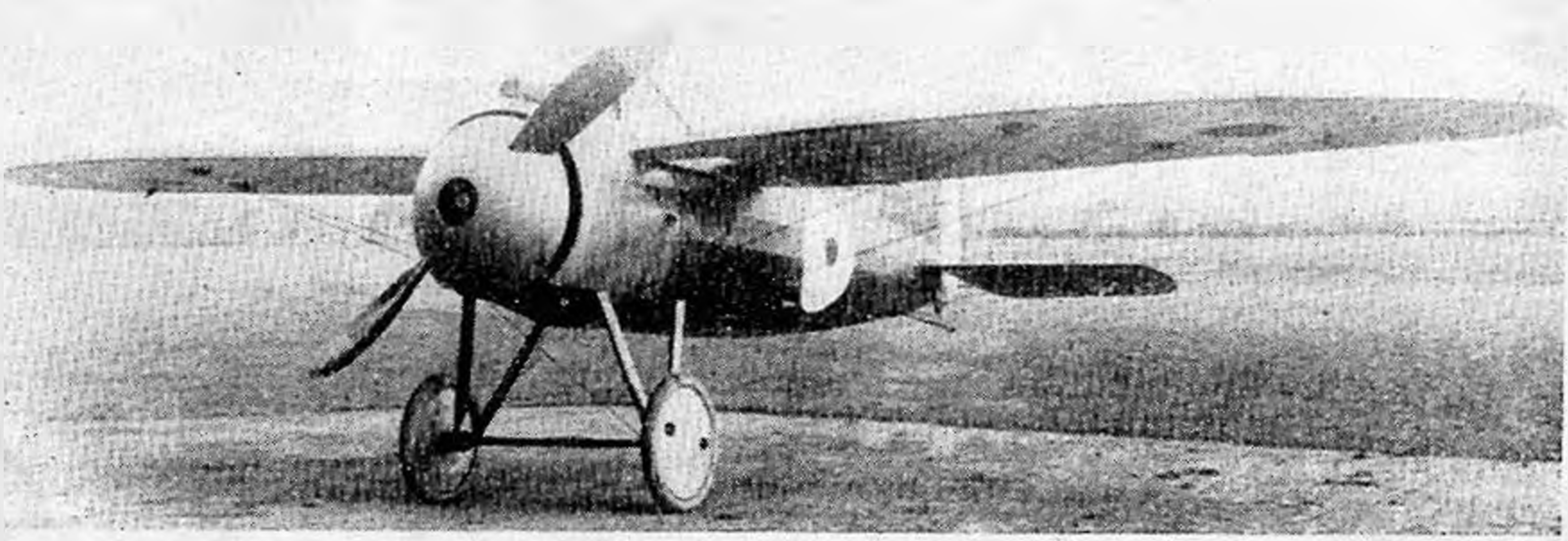
About half-way through the course, Maj. Foote complained that he was suffering from the effects of petrol fumes and subsequent inspection showed that the petrol tank was fractured. This was hurriedly repaired and the machine was able to continue its journey. Watchers along the course saw the machine flying low over the Fox Hills estate and a few moments later it crashed and burst into flames near Chertsey, Maj. Foote being instantly killed and the machine totally destroyed.

Fuselage.

The fuselage of the model was constructed in the usual

The "True to Life" appearance of the model is well demonstrated by comparing it with the full size aircraft below. The Bristol Monoplane shown was of the type used in 1918. It differed from the machine the model portrays only in regard to the motor installation.

[Photo: Imperial War Museum.



FULL SIZE DETAILED PLANS 50×30 ins. PRICE 3/6 POST

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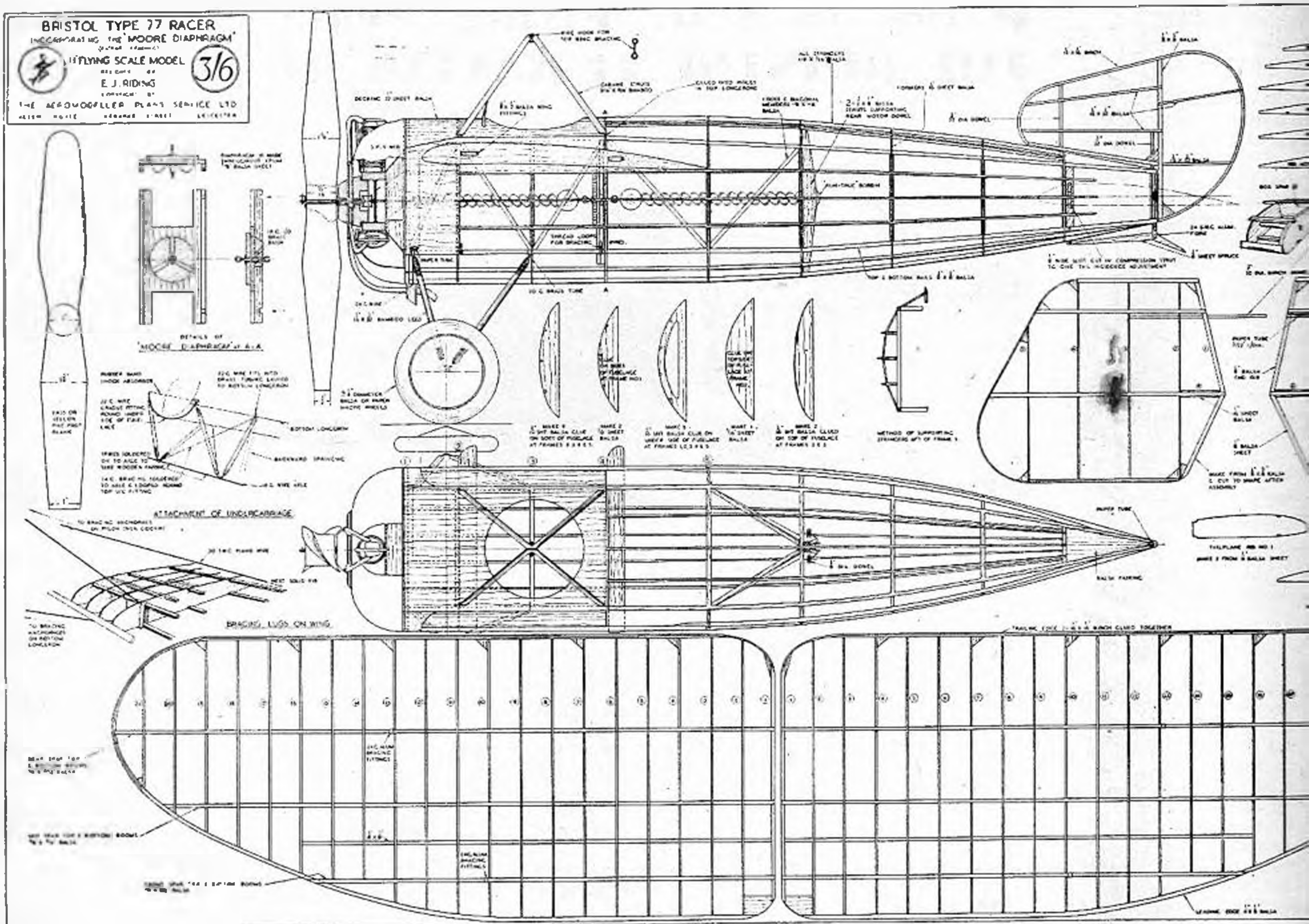

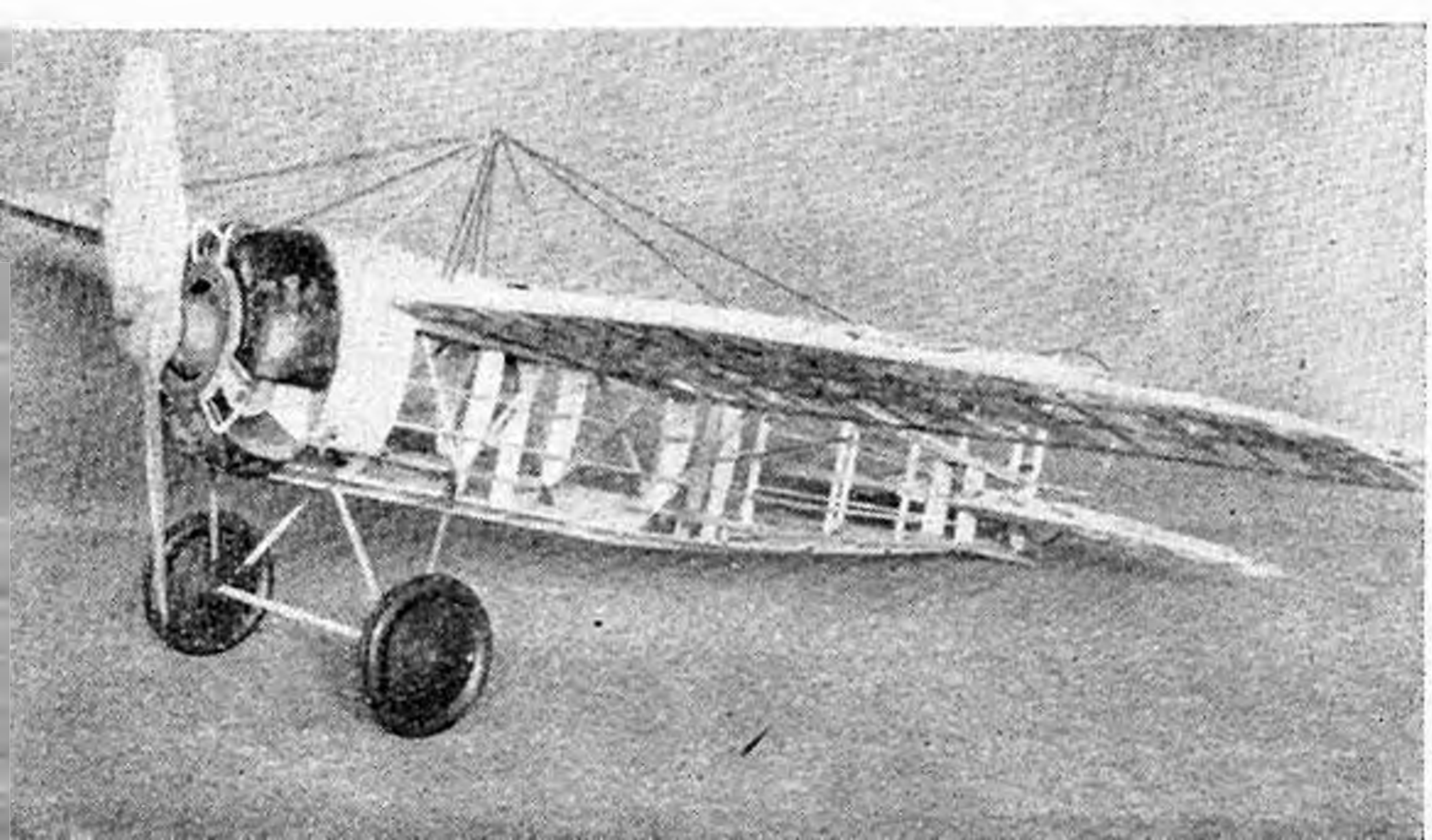

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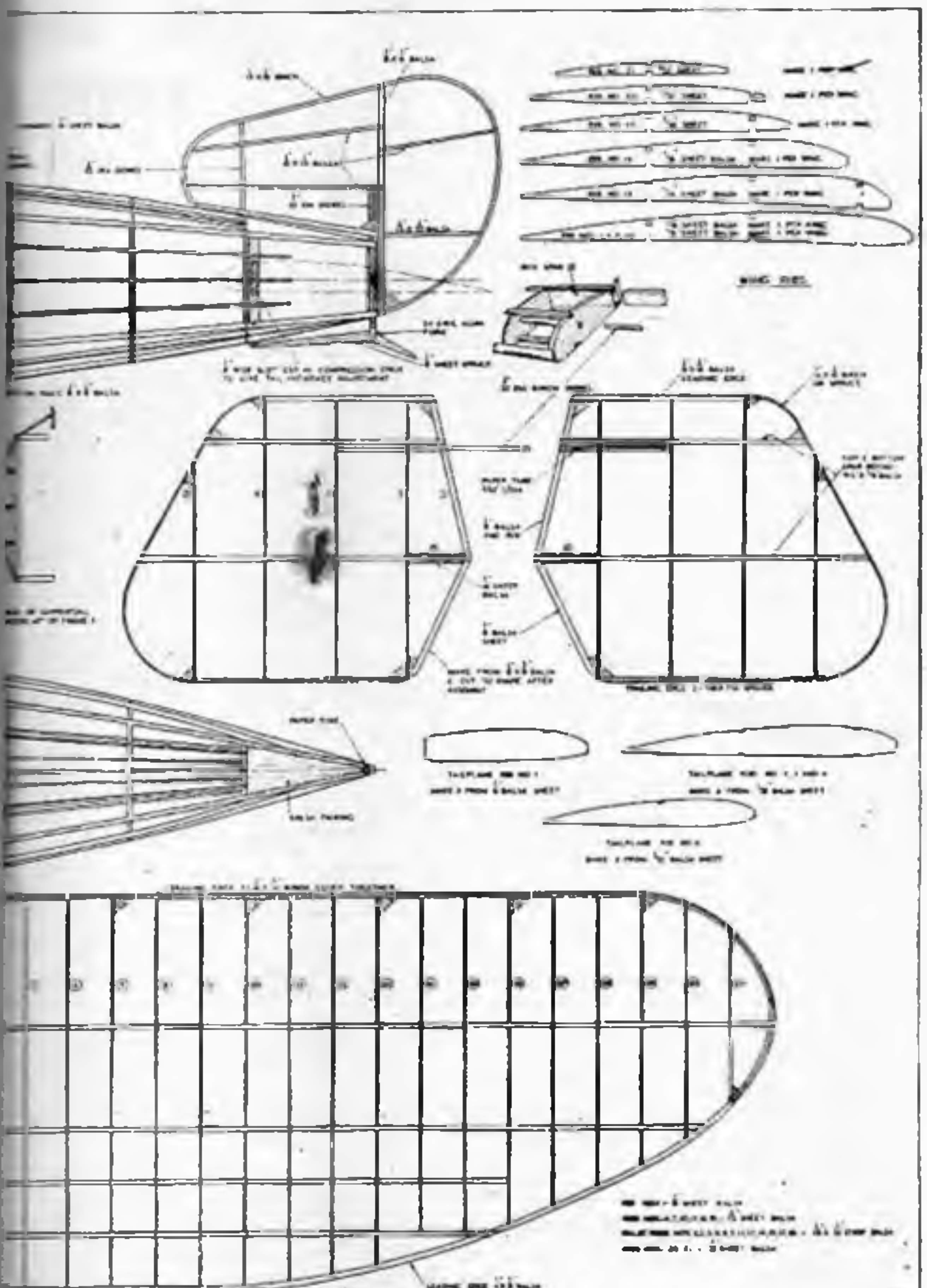
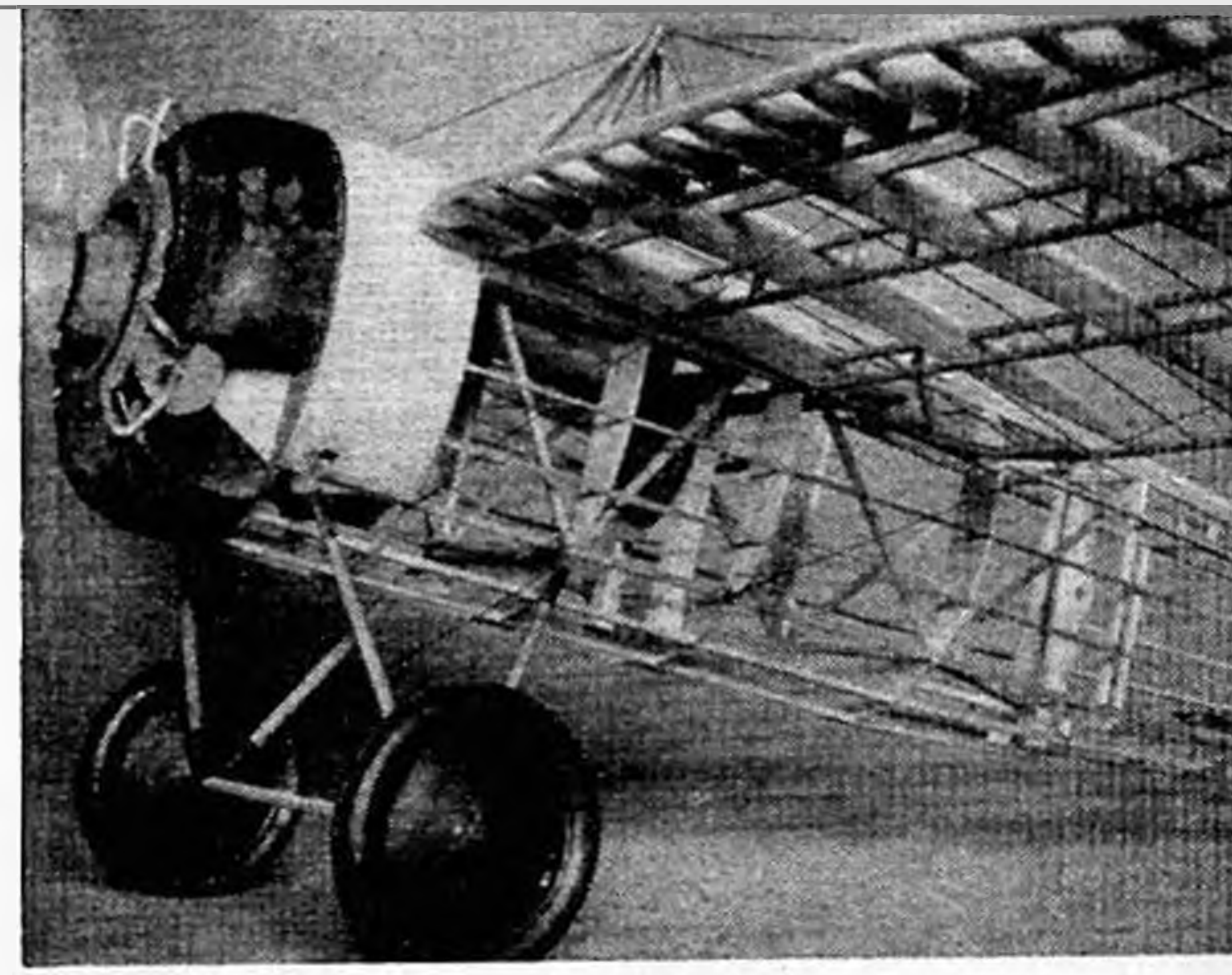
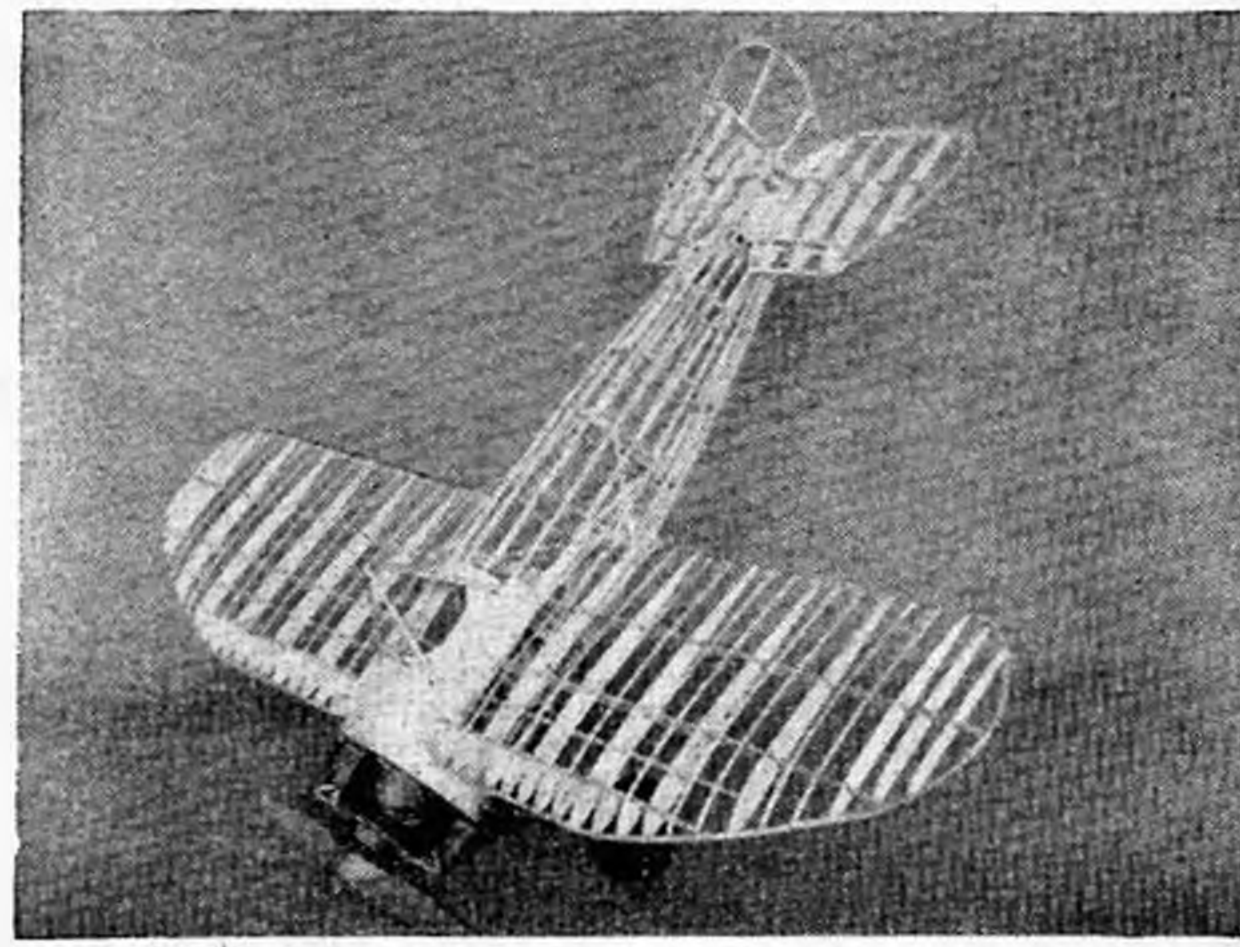
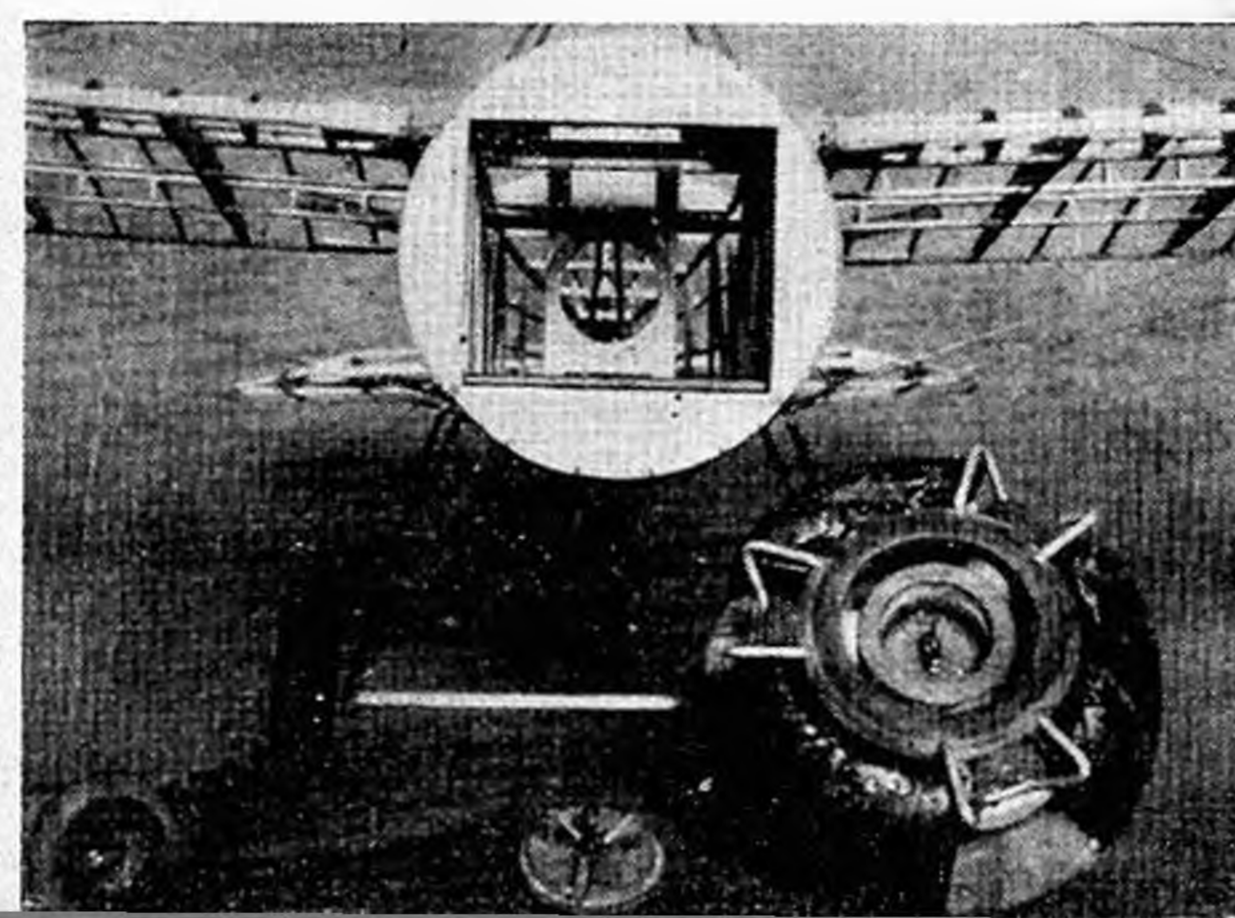
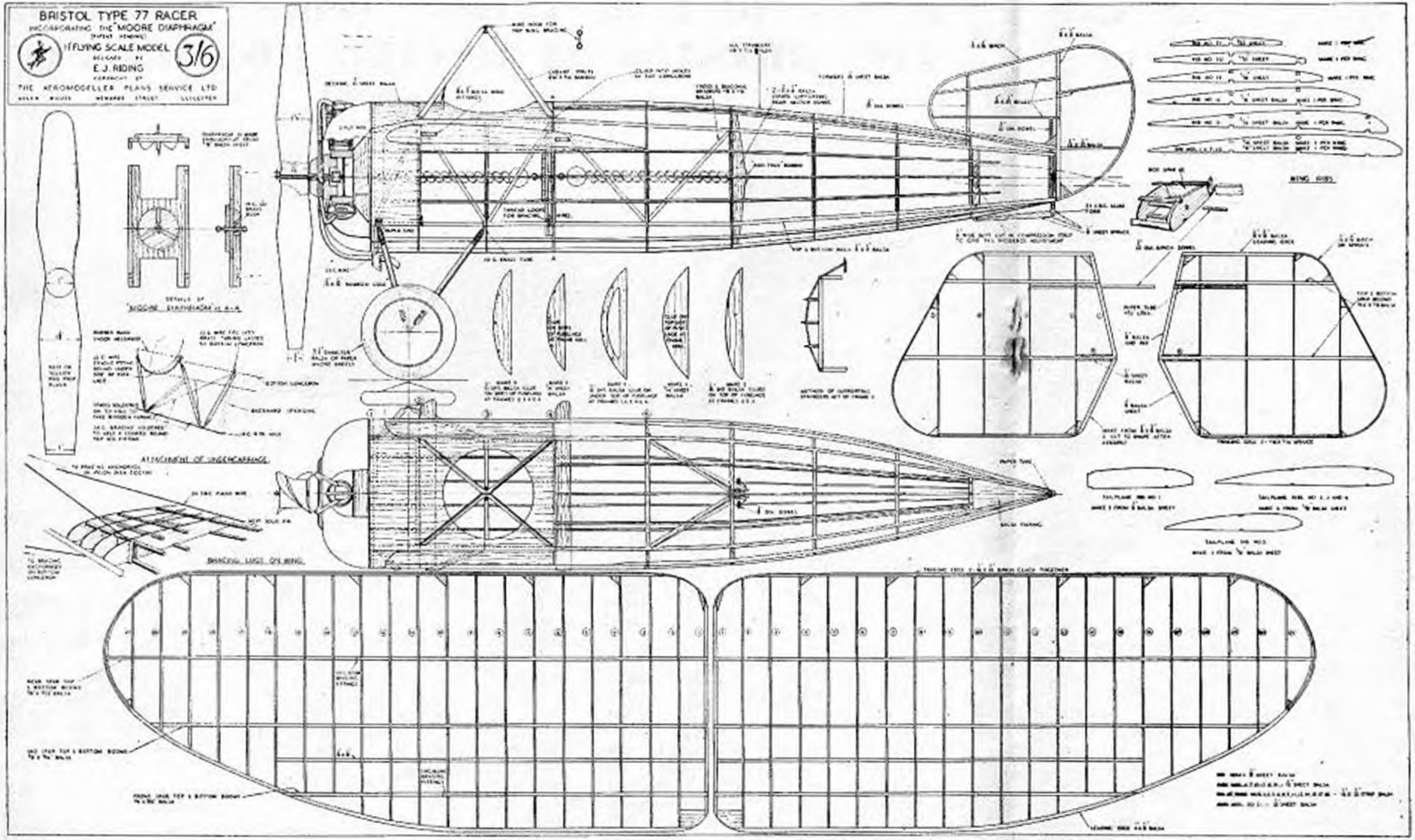


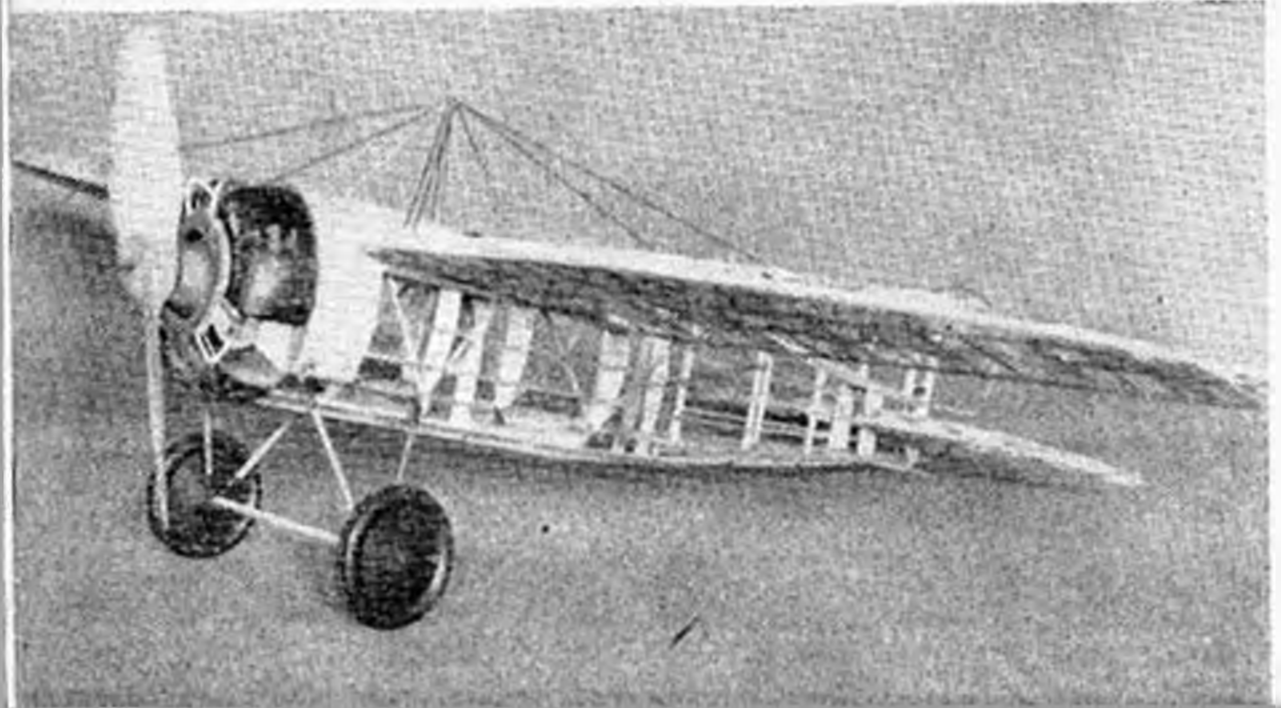




The various " Naked " views of the model shown on these pages emphasise the robust construction and the scale appearance of the wings. Note the former for the Moore diaphragm in the view below. The top photograph shows the diaphragm in position in the fuselage.




BRISTOL TYPE 77 RACER
INCORPORATING THE "MOORE DIAPHRAGM"
E.J. RIDING
3/6
THE AEROMODELLER PLANS SERVICE LTD
ALLEN HOUSE NEWARKE STREET LEICESTER
ATTACHMENT OF UNDERCARRIAGE
BRACING LUGS ON WING
WING RIBS




G-EAVP
G

manner, a sheet of tracing paper being laid over the plan and the ⅛ in. by ⅛ in. balsa longerons and cross members pinned and glued into position.

When dry, the two fuselage halves thus made were boxed together and trued up, using a set-square against the top and bottom longerons.

Formers cut to the patterns shown on the plan were glued to the four sides of the fuselage frame to provide bearers for the ⅛ in. by 1/16 in. balsa stringers over which the covering of superfine Jap tissue is stretched. A month or two ago, Mr. C. R. Moore patented a diaphragm for use in connection with single skein rubber motors and this model is being used as a test bed for his invention. Details showing the construction and assembly of this diaphragm are shown on the plan, but the model can be constructed less this feature if so desired.

The ⅛ in. balsa supports for the rear motor dowel were glued on to the top and bottom cross members at frame 6.

The circular motor plate cut from 8 mm. three-ply, complete with the block balsa engine crankcase, cylinders and circular cowling, were built to the dimensions shown, the rear face of the motor plate being fitted with a flange the outside dimensions of which coincide with the inside dimensions of the square-shaped opening formed by the fuselage frame at No. 1 former. The engine cowling was made by pressing sheets of paste-soaked newspaper into a plaster of Paris mould and allowing to set, after which it was cut into three segments and glued to the motor plate. It is held rigid by the 3/13 in. plywood exhaust collector ring. The exhaust pipes were made from lengths of ⅛ in. aluminium wire fitted into holes drilled in the cylinder heads and the collector ring.

The engine crankcase has a hole cut through it, into which are glued two 1 mm. plywood diaphragms forming bearings for the rear half of the prop. shaft to which is attached the rubber motor. The other half of the prop. shaft runs through the nose block, which fits snugly into the hole in the crankcase and retained by three snap fasteners.

The two halves of the prop. shaft engage each other by means of a fork and " T " drive made from 18 s.w.g. piano wire. This arrangement ensures that the nose-block and airscrew come away completely from the engine in the event of a crash.

The yellow pine airscrew was made to the dimensions shown, runs freely on the prop. shaft and is fitted with a simple free-wheel device on the front face of the boss.

The pylon struts over the cockpit were cut from bamboo and glued into holes drilled in the longerons at the points shown. The apex is fitted with a piece of hardwood in the shape of a small pyramid drilled transversely to take the 24 s.w.g. piano wire bracings.

The undercarriage is made from similar material, the front members being floating and sprung to the bottom longerons by means of a thick elastic band threaded through the fuselage via a paper tube.

The rear undercarriage members swivel about the attachment points on the fuselage, cross bracings of 26 s.w.g. wire being soldered to the 18 s.w.g. axle and bent round the top fittings of each leg at the required tension. The wheels were moulded in the same manner as the nose cowling, but balsa or celluloid ones would do just as well.

The fuselage was covered in four parts—from longeron to longeron circumferentially—the portions around the cockpit and between Nos. 1 and 2 formers being planked with 1/32 in. balsa sheet.

It was treated to several coats of banana oil and sprayed red all over with the exception of the nose and tail portions which are black, and the white registration letters.

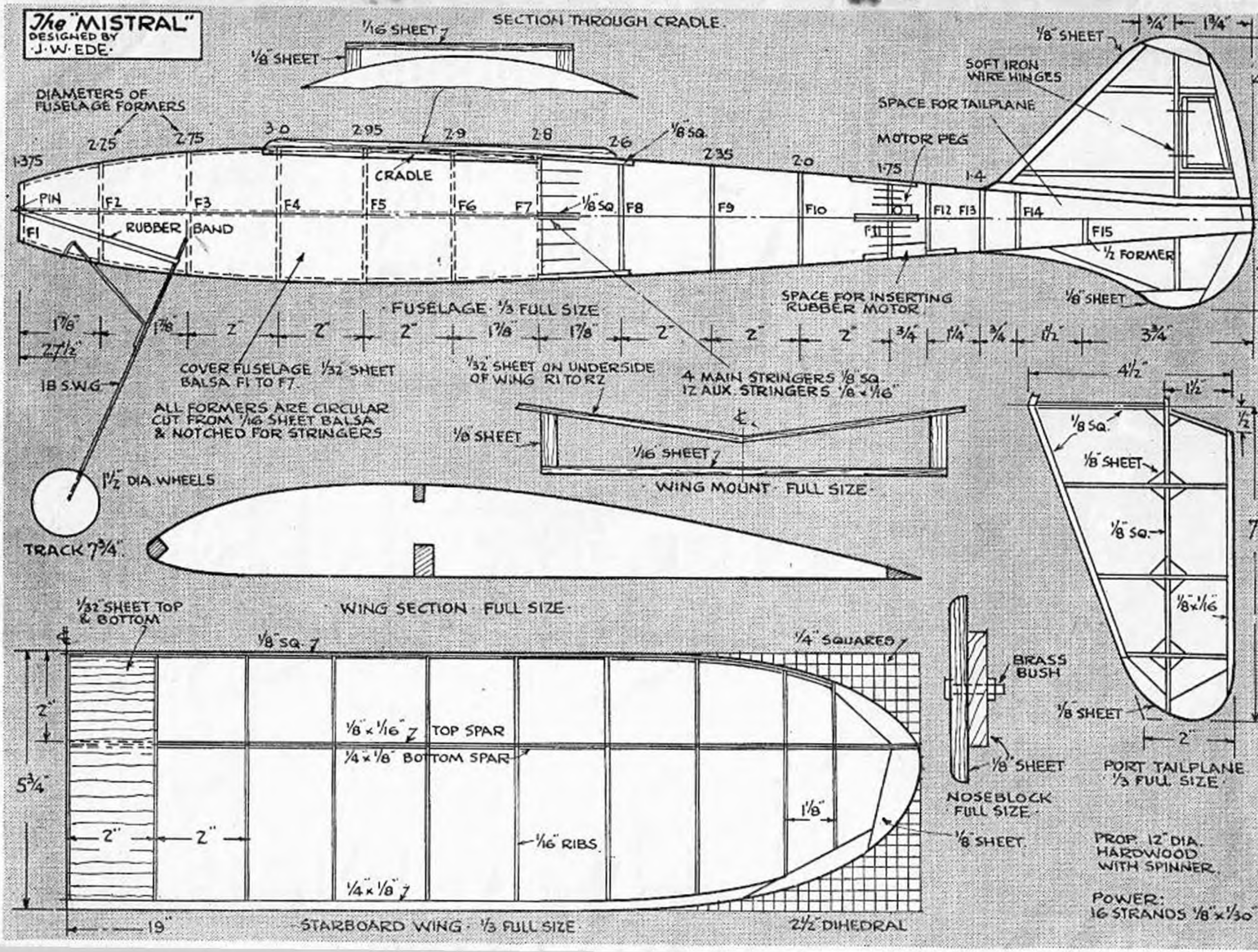
The Wings.

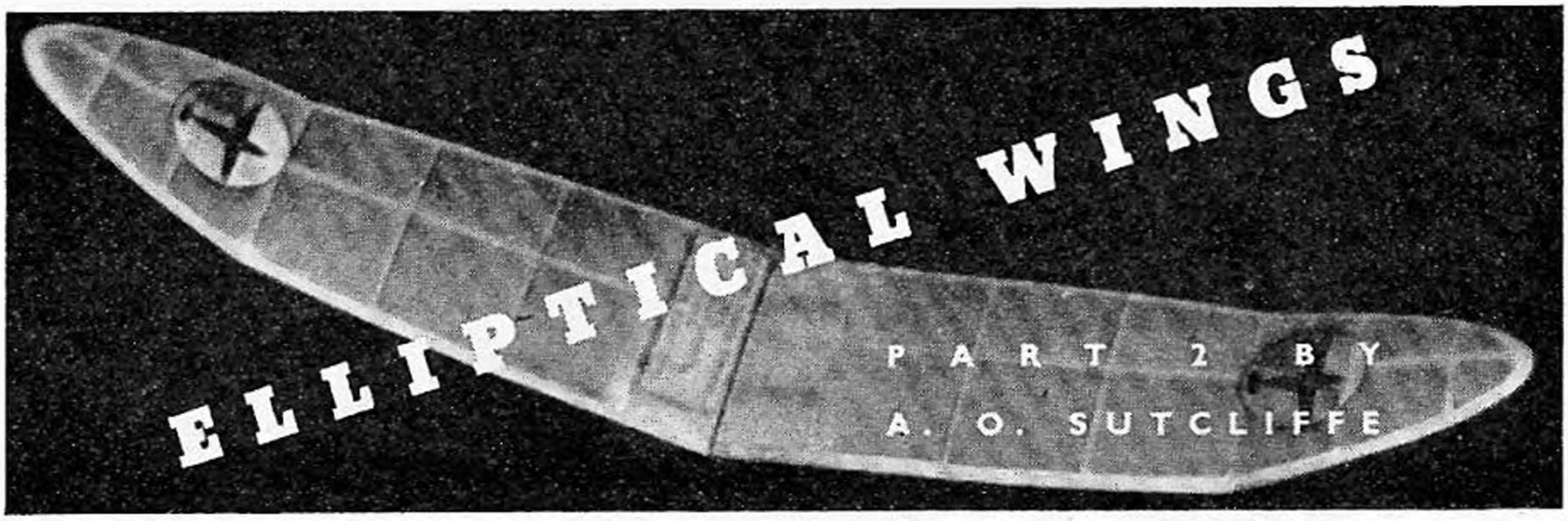
These are rather unorthodox, since apart from having a number of dissimilar ribs to make, there are seven spars arranged as shown on the G.A. drawing. In order to preserve scale effect I have incorporated the correct number of ribs, but only one in three are solid blanks, the others being 3/32 in. by 1/32 in. balsa strips laid over the spars and joined to the leading and trailing edges after the main portion of the wing had been assembled. The complete wing was then sanded to a continuous profile and built up where necessary. The fittings for the bracing wires take the form of 24 s.w.g. aluminium bands wound round the main spars at the positions shown; these were then drilled through ready to take the bracing wires on assembly.

The covering of superfine Jap tissue was applied and treated with two coats of banana oil and then sprayed bright red, the registration letters G-EAVP being painted on in white with the tops of the letters adjacent to the leading edges. When attaching the wings the machine was first placed in rigging position, i.e., with the top longerons level, afterwards offering up the wings and packing with books until the dihedral angle of 2½ degrees had been obtained. The top bracing wires, which are rigid, were then fitted, the lower ones being added later and tensioned by means of rubber bands looped through thread anchorages on the bottom longerons.

Tail Surfaces.

Are slightly over scale size and are fairly simple to make. The tailplane has a Clark " Y " lifting section and is fitted on to the fuselage in two halves. Together with the rudder, they were covered in the same manner as the wings and sprayed black all over with the exception of the white G's and Bristol trademark on the fin.


The "MISTRAL"
DESIGNED BY
J·W·EDE
SECTION THROUGH CRADLE
1/16" SHEET
1/8" SHEET
DIAMETERS OF FUSELAGE FORMERS
1·375
2·25
2·75
3·0
2·95
2·9
2·8
2·6
2·35
2·0
1·75
1·4
1/8" SQ.
CRADLE
PIN
F1
F2
F3
F4
F5
F6
F7
F8
F9
F10
F11
F12
F13
F14
F15
RUBBER BAND
MOTOR PEG
SPACE FOR TAILPLANE
SOFT IRON WIRE HINGES
1/2 FORMER
SPACE FOR INSERTING RUBBER MOTOR
FUSELAGE · 1/3 FULL SIZE
1 7/8"
2"
1 7/8"
2"
2"
2"
1 7/8"
1 7/8"
2"
2"
2"
3/4"
1 1/4"
3/4"
1 1/2"
3 3/4"
3/4"
1 3/4"
4 1/8"
2"
2 7/2"
18 S.W.G.
COVER FUSELAGE 1/32" SHEET BALSA F1 TO F7.
1/32" SHEET ON UNDERSIDE OF WING R1 TO R2
4 MAIN STRINGERS 1/8" SQ.
12 AUX. STRINGERS 1/8" x 1/16"
ALL FORMERS ARE CIRCULAR CUT FROM 1/16 SHEET BALSA & NOTCHED FOR STRINGERS
1/8" SHEET
1/16" SHEET
WING MOUNT · FULL SIZE ·
1 1/2" DIA. WHEELS
TRACK 7 3/4"
WING SECTION · FULL SIZE ·
4 1/2"
1 1/2"
1/2"
1/8" SQ.
1/8" SHEET
1/8" SQ.
1/8" x 1/16"
7"
1/8" SHEET
2"
PORT TAILPLANE 1/3 FULL SIZE
1/32" SHEET TOP & BOTTOM
1/8" SQ.
1/4" SQUARES
2"
1/8" x 1/16" TOP SPAR
1/4" x 1/8" BOTTOM SPAR
5 3/4"
2"
2"
1/16" RIBS
1 1/8"
1/4" x 1/8"
19"
STARBOARD WING · 1/3 FULL SIZE ·
2 1/2" DIHEDRAL
BRASS BUSH
1/8" SHEET
NOSEBLOCK FULL SIZE
1/8" SHEET
PROP. 12" DIA. HARDWOOD WITH SPINNER.
POWER: 16 STRANDS 1/8" x 1/30"



Wing Tips.

Tips should be cut from sheet wood in two or three sections, and outlined with bamboo for protection against chipping in the event of the all-too-common wing-tip landing (Fig. 8). Despite what people say about candles, cigarettes ends, etc., I find that the safest, easier and best method for bending bamboo is to shape it carefully in the steam from a boiling kettle.

The sheet part of the tip may have to be rather elongated, especially at the leading edge, as there is a limit to the curvature this member will stand, and, of course, the radius of the curve diminishes rapidly towards the tip. A tip should always be strong and light—strong to withstand knocks—light to reduce inertia in the event of a spin. Bamboo is extremely useful here, as it gives good strength combined with light weight, and provides rigidity when used with balsa sheet.

Wing Fixing.

Most designers have their own ideas about wing fixing, and there is no reason why they should be modified in this case, unless they are coincident with the impracticable methods of construction mentioned earlier, e.g., it would be inadvisable to use the "plug-in" method employed in Copland's 1940 "Wakefield."

Rubber bands cannot be beaten for their protection of the wings in a crash, but they suffer from the disadvantage that they do not hold the wings firmly in the desired position and readjustment after each flight is essential. Where the wing is plugged directly into the fuselage a *crashproof* fixing is demanded. Dowels and plugs are not crashproof as a hard knock breaks them, or damages the fuselage and/or wings.

The best fixings are the "tongue and box" and S. B. Stubbs' "cradle" fixing (Fig. 9). The latter utilises internal rubber bands and is both rigid and crashproof. Another good method is to have narrow boxes in both the wings and the fuselage, to take pieces of wood strong enough to stand flying stresses, but which will break before anything else in a crash, and can be replaced quickly.

Fairings.

To make the best of an elliptical wing with a streamline fuselage, a good fairing is necessary. This considerably reduces interference drag if done properly, as well as enhancing the general appearance of the model. Most modellers have their own special ways for constructing fairings, but the lavish use of plastic wood is to be strongly deprecated.

In all cases a strong rib of $\frac{1}{8}$ in. sheet should be fixed so that it makes close contact with the whole face of the wing root rib. The wings should always be constructed before the fillets so that they can be used to judge the correct shape of the latter.

For best results the wings should be faired into the fuselage all round, but this should not be overdone. A fairing which is too large is worse in every way than one which is too small. The fillet should not be longer than 1/5 of the chord and should be partly reflexed when an undercambered section is used.

Even if a little extra trouble has to be taken, a well-constructed pair of elliptical wings will be worth it, but *care must be exercised*—bad construction can easily cancel out the extra efficiency this type should possess.

Incidentally, much that I have said may be applied to the construction of the outer sections of the popular "Korda" type wing. This is a good compromise between a constant-chord and true compound-ellipse wing, and the polyhedral gives good stability.

Covering.

The main difference between covering an elliptical wing and covering a constant or tapered chord type is that in the former case the covering material has to be curved in two directions at once, without wrinkling. In the latter case it has only to be curved once. Now it is quite a straightforward process to bend a sheet of flexible material in one direction, but to bend the same sheet in two directions without folds would appear to be impossible. But it is not—what really happens, of course, is that the covering is stretched slightly in the middle and/or shrunk at the edges.

Jap tissue should be used on smaller wings, and silk (if you can get it) or heavy bamboo paper on larger ones. Bamboo and English tissue (awful stuff) should be avoided on wings up to 4 ft. span.

The following method has been very successful, although it may seem to contradict some of the well-known "rules" of covering. Dealing with the underside first, a piece of tissue is cut about $\frac{1}{4}$ in. oversize all round, with the grain running from leading to trailing edge. Using some strong quick-drying tissue adhesive (not banana oil), the appropriate end of the issue is stuck to the middle part of the root rib, and, when dry, stretched *very slightly* and stuck to the tip rib. If desired, the tissue may be fixed to the intermediate ribs with banana oil.

If the ribs have undercamber, the covering is stuck to this part of them and, when dry, banana oiled to the trailing edge. Then the covering is stuck to the leading edge with banana oil, if this member is large, or with tissue cement if of small section. It is easiest to do this correctly if the tissue it slit at the edge with scissors every inch or so, and the flaps so formed are stuck down one at a time, starting at the root. Care should be taken to see that the covering is not pulled diagonally (this is easily done), or it will "bunch up" into a terrible mess near the tip.

It saves time if both wings are covered together, carrying out an operation on one while the adhesive of the other is setting.

The upper surface is covered in a similar manner to the lower, only the tissue will need to be stretched slightly more and even greater care taken. I find that it does not hurt to slit the covering with scissors every 2 in. to a point approximately half-way between the spar and the leading edge and stick the "flaps" down to the leading edge as before. Each flap now has a small wedge-shaped overlap. These slits are sealed with banana oil applied with a small soft brush. The banana oil must be allowed to dry thoroughly before doping.

The tips are covered with separate pieces of tissue (grain still running from leading to trailing edge). The piece is attached to the middle of the tip rib, to the extreme tip and then to the rest of the tip rib, and stuck down little by little, working towards the root. As far as covering is concerned, the "tip-rib" should be about 20 per cent. of the semi-span from the extreme tip.

Doping.

Always use a wide, soft brush as the covering is bound to be rather slack. The wing should first be water-sprayed and allowed to dry for at least 12 hours. The number of coats of dope, etc., depends upon the type and size of the 'plane and most builders know how much to apply. Some people use only banana oil on wings but at least one coat of dope should be given in this case. I find that two coats of dope followed by one of banana oil are sufficient for the wings of a medium-sized 'plane. A great improvement in finish can be obtained by allowing at least 12 hours between coats (the longer the better). If this is done, and the covering and doping executed with reasonable care and patience, there is no need for a single wrinkle to appear in the finished covering.

If these articles have simplified the prospect of elliptical wings for a few, and enlightened others on certain points, they will have fulfilled their purpose, but I know there will be many who will disagree with some of my views and methods. I shall welcome constructive criticism in the form of "Letters to the Editor," or to me personally c/o the Editor, as I hope to see an increased interest in this type of wing as it seems to form one of the few practicable means of "getting out of the rut," and making a sound advance towards perfection.

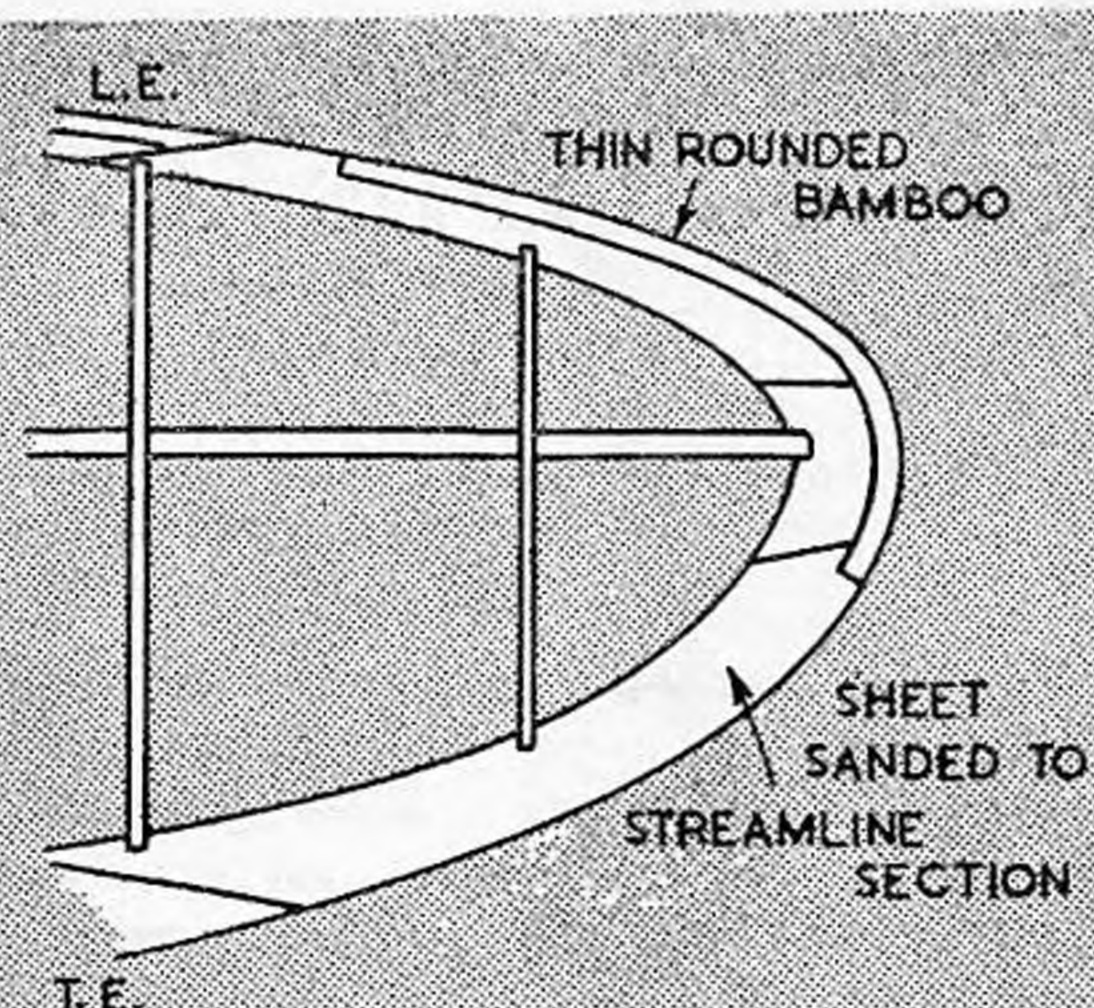


FIG. 8

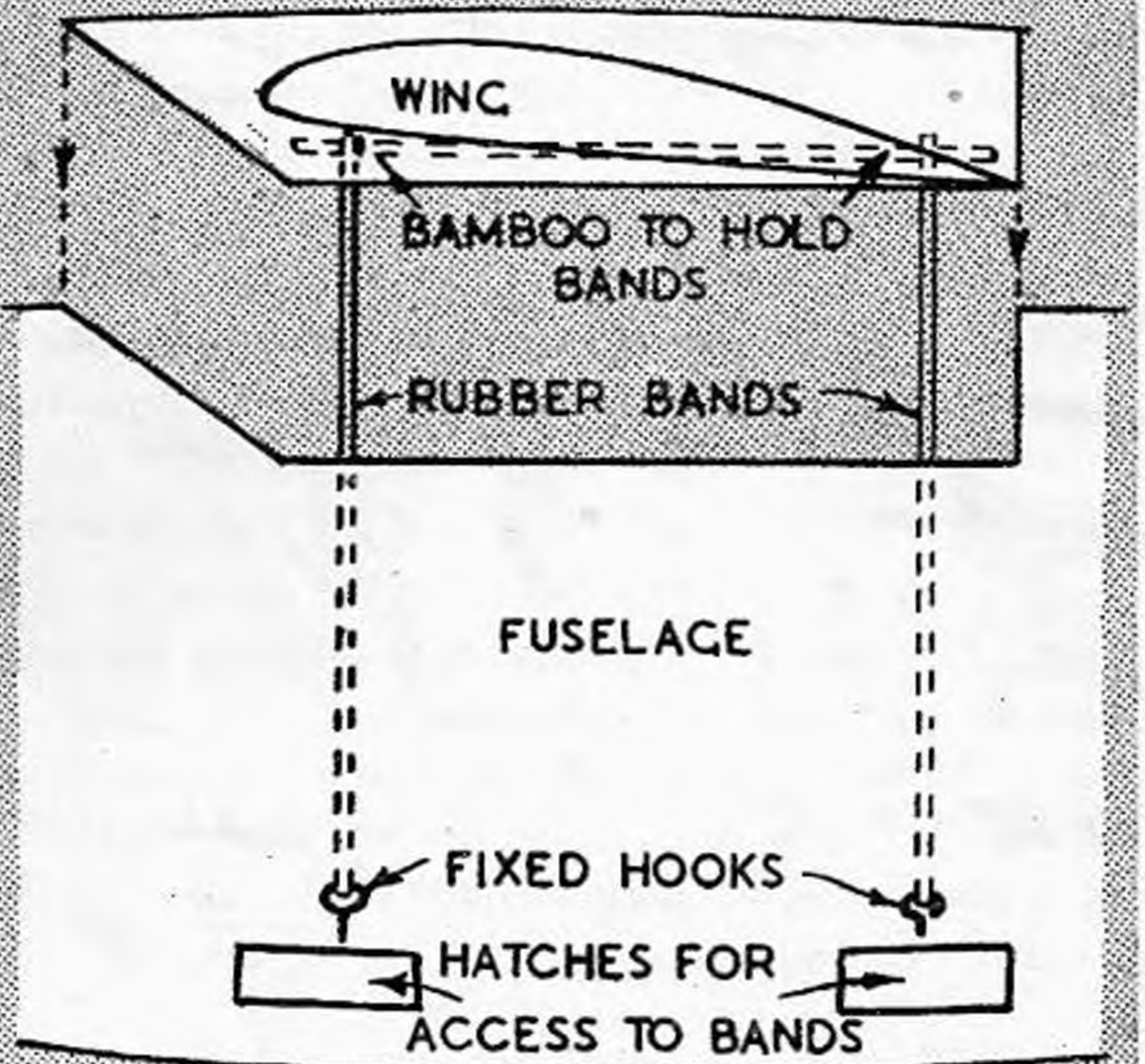
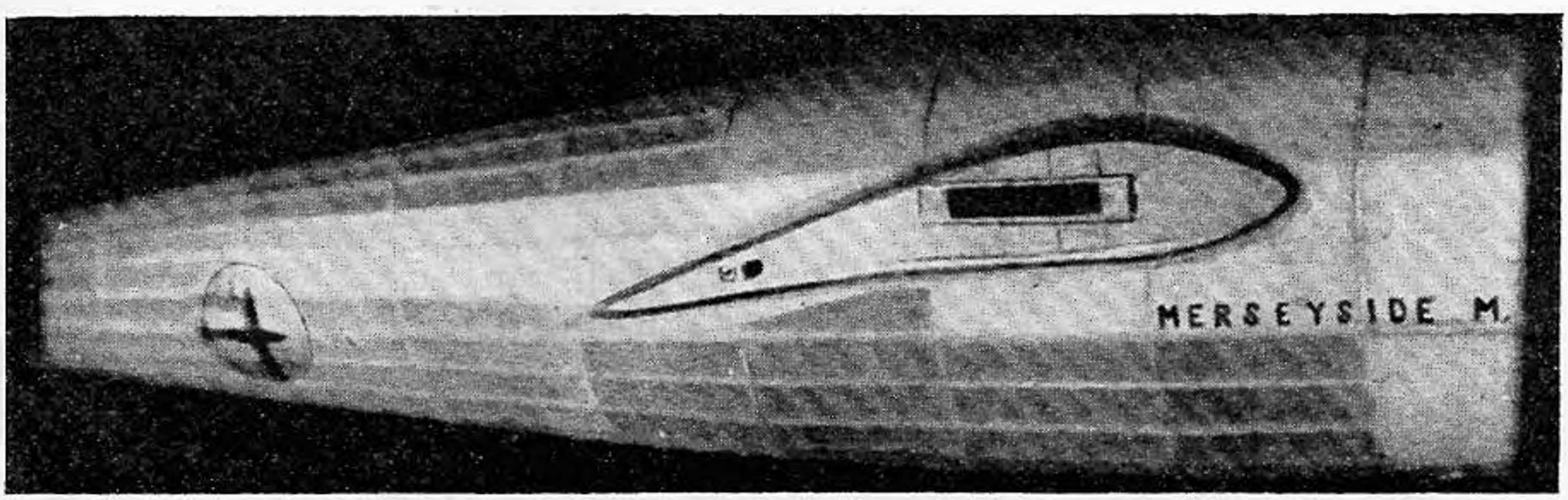


FIG. 9

Below is shown a wing fillet as fitted to the author's Wakefield model.



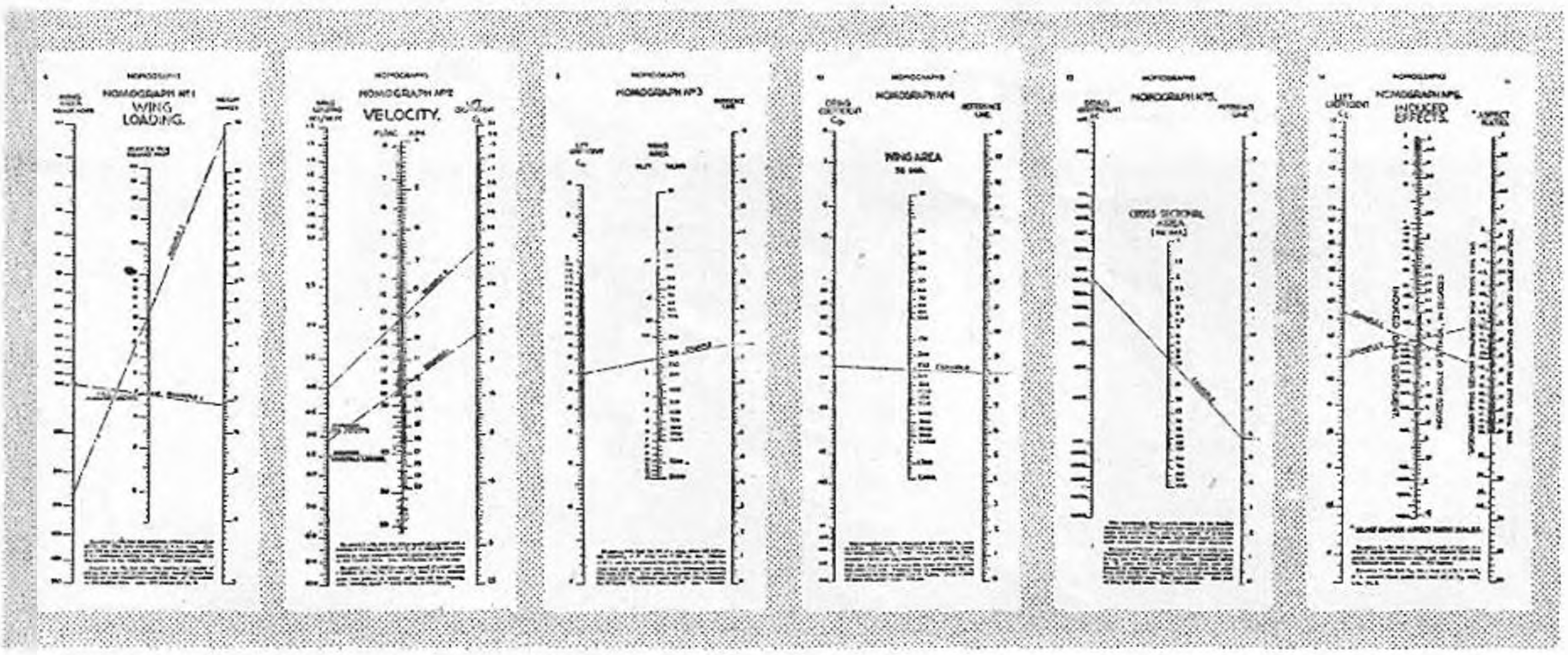
NOMOGRAPHS AND THE AEROMODELLER

In this article is given a brief description of the AEROMODELLER Nomographs. It seems apparent that very few modellers are aware of the advantages to be gained from their use. Tedious mathematical calculation is entirely eliminated, and accurate prediction of the performance may be made before the proposed model leaves the drawing board.

I AM frequently asked by young aeromodellers, whose future careers are, as yet, rather indistinct, just what the chances are of becoming a full-size aircraft designer. My reply consists of a question. Are you a natural mathematician? The study of advanced aerodynamics requires a sound knowledge of maths. Unless the would-be designer is possessed of this distinction, or is prepared by hard work to acquire it, I am afraid his chances are not very great.

In the realm of model aircraft the required mathematical standard is not so high. In fact, many modellers will have nothing to do with calculations. They work on knowledge gained by past experience, often with highly successful results. Nevertheless, there can be no doubt that the more serious builders do master the necessary mathematical aspects of the hobby. This article is intended for those modellers who, whilst earnestly desiring to get this side of the business taped, cannot add two and two and make the answer five—er four. (Ahem!—Ed.) To these enthusiasts the solution lies in the use of Nomographs.

For the benefit of modellers who may not have heard of the Nomographs, or who are not acquainted with their many uses, a description will not be out of place. Produced by the Harborough Publishing Company and compiled by R. H. Warring, they cost 2/-. Although a considerable amount of work has gone into compiling the scales their actual operation is extremely simple; wing loading, velocity and stalling speed, wing lift, wing drag, parasitic drag, induced effects, L/D ratio and gliding angle, horse power required, horse power available, rate of climb, Reynolds Number, and airscrew design factor "J" are all covered. Their operation is merely a matter of laying a straight edge across three verticle scales. For instance, to use the Nomograph giving wing loading, one finds the wing area in square feet on the left-hand scale and the weight of the model in ounces on the right-hand scale. A rule is then placed across the scales touching at these two known quantities. The answer, the wing loading, is read of where the centre scale is cut by the rule. The next requirement may be the model's flying speed. This may be obtained from Nomograph No. 2 giving velocity and stalling speed. Now that the wing loading is known it is noted on the left-hand scale. The centre scale shows the velocity in ft./sec. and m.p.h., while the right-hand column details the lift coefficient. The wing loading and the lift coefficient are known and the rule is placed at the appropriate place on the outside scales. As in the former example the velocity is read off on the



centre scale where it is cut by the rule. So much for Nomographs Nos. 1 and 2.

No. 3 deals with wing lift and is based on the formula L equals $C_L \frac{p}{2} SV^2$. It is a double Nomograph from which immediate readings may be had for lift, C_L, wing area, or velocity, it only being necessary for the operator to know three of these factors. Incidentally, m.p.h. may be instantly converted to ft./sec., or vice versa, from the velocity scales.

No. 4 is similar to No. 3, but deals with wing drag as against wing lift.

No. 5 deals with fuselage drag. Based on the cross-sectional area of the component it provides a quick solution of parasitic drag problems.

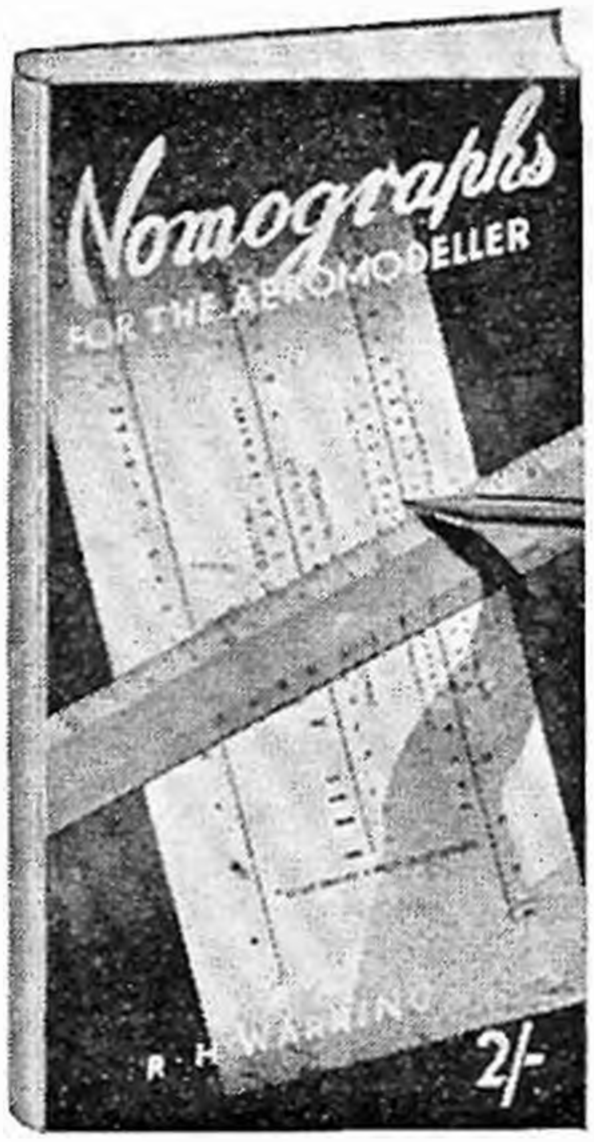
No. 6 covers the change in drag coefficient and angle of attack due to induced effects. Its successful operation is a matter of seconds.

No. 7, Lift/Drag ratio and gliding angle, is of the utmost importance to modellers. Once the L/D ratio is known it is a simple matter to compute the gliding angle a model will adopt. Many modellers will not need to be reminded just how many wrecks they might have avoided had they been able to forecast the gliding angle, even reasonably accurately.

No. 8, Horse Power required to maintain level flight. This factor is a function of the velocity and drag of the model. The correct value for any combination of design figures likely to occur in model work may be found by means of this Nomograph.

No. 9, Horse Power available. This scale was compiled as the result of numerous tests on many samples of rubber. It gives the average brake horse power that may be obtained from most brands.

No. 10, Rate of Climb. Having found the horse power required for level flight from No. 8, it is a simple matter to calculate the available horse power from No. 9. The result is the excess horse power available, and this is use in Nomograph 10 to ascertain the rate of climb.

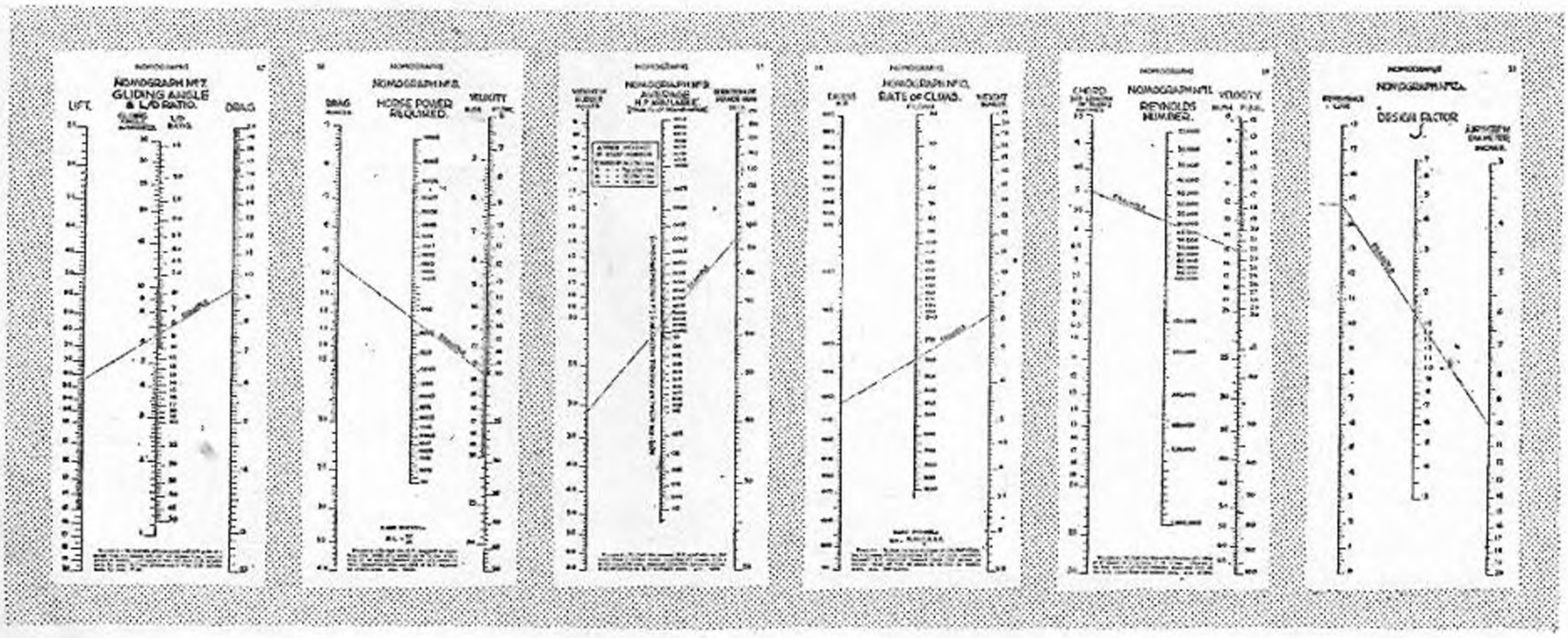


No. 11. Reynolds Number. Comparative data on aerofoils in common use by aeromodellers is of little use unless some form of reference is available. This is where Reynolds Number, which is a measure of the aerodynamic scale, is employed. Always a rather tricky calculation, it is easily obtained for the particular aerofoil being used by means of Nomograph II.

No. 12. The last of the present series gives the design factor "J" i.e. $\frac{V}{nD}$, one of the most important in airscrew design.

That is a very brief description of the possibilities of the present series of Nomographs. Discerning modellers will at once see the considerable advantages to be gained from their use. The non-mathematically minded will appreciate that a complete specification of a proposed model may be laid out even *before* the drawing board stage is reached. Prior to the advent of Nomographs such procedure would have entailed considerable advanced calculation. It is hardly to be wondered at, therefore, that the majority of modellers built their machines first and did their calculations afterwards, mostly with the aid of a wet towel and ice pack. There is no reason now why the modeller should not lay out a neat and accurate specification which, together with the general arrangement and detail working drawings, will make an interesting and informative history sheet for the modeller's library.

D.B.M.W.



READERS' . . . . . LETTERS

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

Dear Sir,

I recently returned to Scotland after a year in Canada, during which time, abetted by the contemporary American model magazines, I became re-imbued with a desire to construct models. I am essentially a "solid" fan, having a driving urge for detail.

Returning to this country, I continued to pursue this new pastime, and now, but not without some difficulty, I have organised regular delivery of your magazine.

To get to the point. Templates are necessary in order to make a good solid. Since, however, the average modeller does not intend mass producing a single type, the trouble taken in making the templates is largely wasted. I am surprised, therefore, that enterprising model dealers do not market sets of templates, or that makers of kits do not include them. I happen to know that such sets of templates are marketed in America.

Morayshire. H. F. SHEAR.

Dear Sir,

I enclose a diagram of an automatic variable pitch propeller suitable for single blade fixed or folding arrangement. It was tried out on a model some time ago but was not satisfactory, due to the fact that I had used only a 20 s.w.g. "return spring." The torque of a Wakefield motor was too strong for this spring, with the result that the prop. blade was turned round almost at right angles to the direction of motion of the prop. The propeller was smashed in the subsequent crack-up, and due to the necessity of getting another Wakefield ready in time for a forthcoming contest, further experiments were abandoned. I think it has possibilities, and perhaps other readers might be tempted to experiment and no doubt improve on it. A brief description of the working is as follows :—

The shaft "A" under the torque of the motor which is transmitted through "striker" "B" to torsion bar "D," tends to turn the prop. "extension hub" "F" about pivot "E." This turning effect is opposed by spring "C," which is made up by winding 6 or 8 turns of 18 s.w.g. (or even 17 s.w.g.) on a peice of 16 s.w.g. wire. It is then slipped on the front of the prop. shaft and the 3 or 4 turns soldered firmly on. Make sure to leave at least 2 turns free from solder. Under full torque the hub swivels against the action of "C," an amount governed by the pitch variation required (this variation having been previously calculated, of course) and controlled by means of the small wire stop "H," which is pushed into the hub and cemented. As the torque dies off, the spring "C" returns the prop. gradually to its "fine pitch" position i.e., under full torque pitch is coarse, gradually getting finer as torque diminishes. The size of components will vary with different designs, but the complete hub should be no bigger than the average Wakefield type prop. hub.

There is one point to be borne in mind when using this type of prop. To wind the motor up it is necessary to disconnect the rubber from the prop. shaft, and wind it up directly with the winder. When the motor is wound up, then remove it from the winder hook and replace it on the prop. shaft hook.

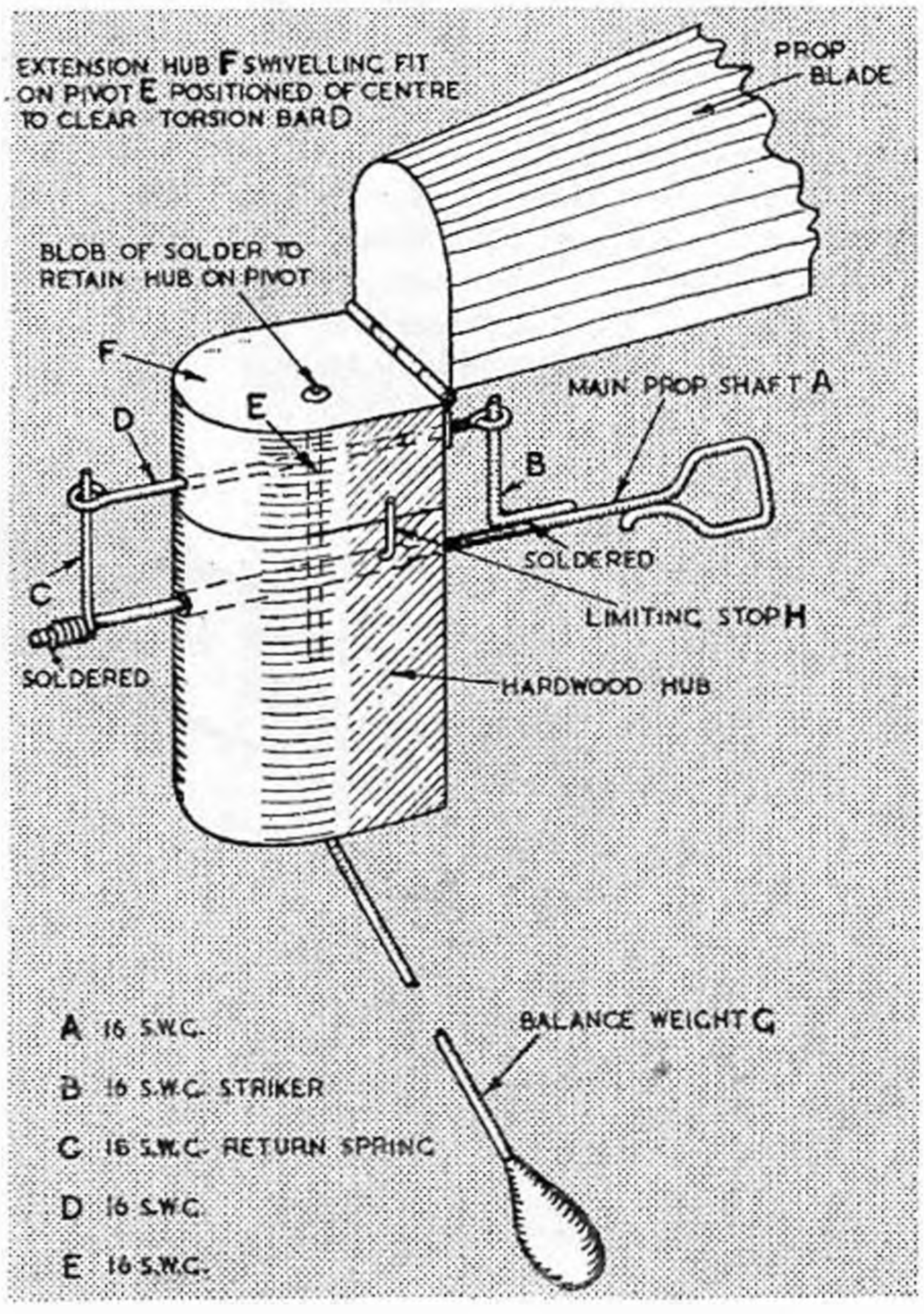
Eire. R. FLANAGAN.

Dear Sir,

The June issue of the "Aeromodeller" contained a letter from Mr. R. Flanagan re variable pitch airscrews. I have only had time to go briefly into this matter, so I will not deal with the question of relative flying speeds under climb, level flight, and glide—for practical use in airscrew calculations, I think that the level flight condition can be used throughout.

My real point lies in his remark "The whole problem seems to be 'n' (airscrew revs.) constant. To do this Mr. Warring says the ideal arrangement would be to have the pitch governed by the torque." I cannot see why we should attempt to keep 'n' constant with a variable pitch airscrew—a variable area blade would do that, and is the most efficient answer to the whole problem, but presents practical difficulties. Truly. Mr. Flanagan's method of high initial pitch could be made to keep 'n' constant, but only at the expense of semi-stalling the blade at the beginning of the flight, and semi-feathering it at the end. If we wish to make a variable pitch airscrew which will always operate as near to maximum efficiency as is possible with constant area, constant diameter and variable revs., then the angle of attack of the blade element should remain constant (the angle of attack to the relative wind). This means a varying pitch which is a function of rotational speed (which varies with torqte) and forward speed. It is clear that the high initial revs. will require a finer pitch airscrew in order to maintain the same blade element angle to the relative wind—by "relative wind" I mean that caused by the combination of forward and rotational motion. In actual fact, some years ago I designed an airscrew which would give just such results (independent of torque). This project was postponed owing to lack of time, and I eventually abandoned it because I realised that although the above theories were quite correct, such a variable pitch airscrew would give very high revs. indeed under the initial power burst, in order for the normal blade area to absorb the torque while working at a reasonable blade element angle (and fine pitch). With a rubber motor, this would very quickly lose the first few hundred turns. I therefore decided to use the normal fixed-pitch airscrew, which has the blade operating at a very high angle of attack under the initial power, maintaining high thrust (*vide* Mick Farthing's climb) yet keeping reasonable revs. owing to its semi-stalled condition.

Continued on page 572



Continued from page 570

I have only dealt with the "high torque" condition which I consider to be by far the most important, but Mr. Flanagan will see that his conclusions coincide broadly with my own reasons for accepting the fixed-pitch airscrew. As a point of interest, I hope to fly shortly a model with a torque compensating device to enable me to keep a model stable while using a high power and large area, coarse pitch airscrew.

Incidentally, by this time Mr. Flanagan has probably seen the article in the same June issue which mentions an airscrew designed by Mr. G. W. Harris to give high initial pitch by flexing of hinge arms at the blade root. This method has the advantage of low weight—an all-important consideration.

Bucks. G. MANSFIELD.

Dear Sir,

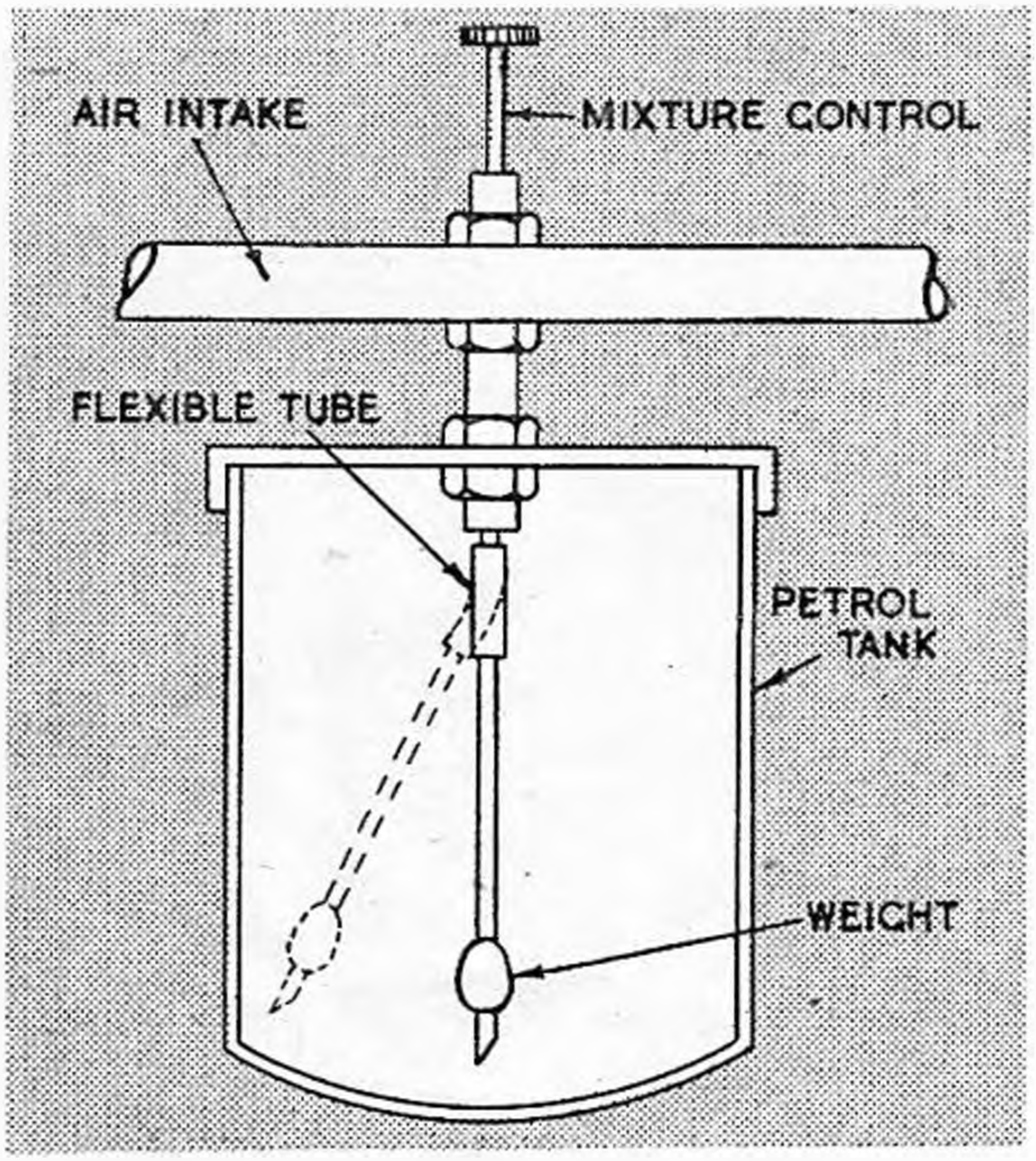
I notice from their last few articles, Messrs. Bowden & Forster are anxious to solve the problem of petrol level variation in the tank of a model aircraft while in flight.

Working along the lines of the "Mahomet/Mountain" theory I have evolved the modified tank shown in the accompanying rough sketch. This consists, as can be seen, merely of a petrol pipe, mounted on a rubber (or any other) flexible tube. This tube, which should be of the non-collapsible type if possible, allows the petrol pipe to follow the petrol in its journeys about the tank.

Owing to the fact that the engine which I owned at the beginning of the war has been stolen by the only "Black Sheep" I have ever met in the aeromodelling fraternity, I have not been able to test the device.

If any "petroleer" can find time to test the device his findings, will' I am sure, be welcomed by other readers as well as myself.

Bucks. B. F. CORNWALL.



RADIO CONTROL APPARATUS.

Dear Sir,

With regard to the article under the above heading, by J. A. I. Reid in the July number, may I submit the following improvement. Mr. Reid states that the main disadvantage of his system is that the set has to be transmitting all the time that the machine is not in level flight. I suggest making the reduction gear 10 : 1 instead of 5 : 1. This will require a complete revolution of the escapement wheel to accomplish a 1/10 revolution of the cam. Thus a single impulse immediately released will move the cam from a neutral position to one of the control "bumps." A further impulse will be required to return to neutral. I think that that will be sufficient to do the job, everything else being left according to Mr. Reid's instructions.

May I also take this opportunity of expressing my appreciation of your magazine.

Glos. F/O W. EARLY.

Dear Sir,

I should like to reply to Mr. C. R. Tottle's letter in the July "Aeromodeller," concerning mine in the April issue. Although my criticisms were directed against the design of the units concerned, most of them apply equally to the more practical aspects of materials and construction.

With regard to unit one, I shall think that the engine cylinder/s should be mounted behind the compressor. I believe that the gain in efficiency will merit any difficulties that arise, and in any case, using the materials stated, trouble will probably be experienced with the compressor. I do not know the usual temperatures encountered in miniature two stroke exhausts, but I presume that they are similar to those of their larger brothers. This being the case, trouble will probably be met with the thin sheet aluminium casing, and perhaps also with the magnesium alloy rotor (or would it?) knowing Mr. Tottle to be a metallurgist I put this more as a question than a statement, as I cannot see how he can have missed this point, if it is correct.

Now as to mounting the engine behind the compressor, I think this is worth while, whatever the difficulties. I myself, like Mr. Tottle as an experimenter, though in the realm of airframes rather than that of power units, but I always strive after the highest efficiency possible. Thus it seems to me that in a unit as notoriously inefficient at our end of the scale, as this, a further reduction in efficiency should not be made merely because one or two easily surmountable difficulties arise. In any case, I think the engine can be put in its proper place without encountering the snags which Mr. Tottle fears. The solution seems to lie in placing the engine directly behind the blower, with the cylinder/s protruding into the nozzle/s. This will entail very little trouble with the engine controls, particularly if the engine is an inverted single cylinder one. On reflection, it will be seen that a single cylinder engine most definitely scores here, and thus it was not irrelavent of me to suggest this type. Also, the unit would be easier to build into an aircraft of the orthodox (I might almost say—the old fashioned) layout.

Now we have the engine in its proper place, Mr. Tottle does not agree that fuel injectors will not be needed. It would seem that "full-size" designers do not agree with him, as reference the Junkers jet reaction plant, to quote only one example, which utilizes the exhaust gases from the two stroke behind the compressor to heat the air. There are others, and although some which use a four stroke have fuel injectors as well, it would seem that two strokes waste enough fuel, without needing extra help. Of course Mr. Tottle may have experimental proof to the contrary, with respect to our end of the scale, and if so I shall be glad to hear it.

I still maintain, also, that an axial flow compressor would be more feasable from the amateurs' point of veiw, as I cannot help thinking that, on an average, very few modellers possess adequate facilities for machining rotors, involute casings, directional vanes, etc. As a matter of fact, it was lack of facilities coupled with very limited spare time, that brought to a halt my own experimenting with J.P. over a year ago. If, however, Mr. Tottle has solved the problem for the amateur, that drawback has been removed. If now, it would seem that an axial flow compressor, easily made with a lathe and a few hand tools, will reign, at least in "home made" units.

With regard to unit two, I still think that a single channel and an axial flow compressor would be much easier to build, and would be easier to accommodate in a model. If cooling is needed, a pair or perhaps two pairs, of small air scoops which pass air over the region in need of cooling, would be sufficient. This air could then be drawn into the main airflow, as in a thrust augmentor.

Glos. P. R. PAYNE.

THE SIR JOHN SHELLY CUP

Continued from page 552.

Bill White, of Blackheath, with one of the nicest-looking machines of the day, also experienced motor trouble. Here again perseverance showed results, and the model took off for an excellent test hop. However, Bill's Gremlin must have been hovering near, as a few minutes later, whilst attempting his first competition flight, the motor stalled at take-off, with disastrous results to the engine mount. Why do these airscrews always meet terra firma in the downward position ?

D. R. Birchall, flying a pod-fuselage model, provided the best crash of the day by shedding a wing at 100 ft., the results being somewhat expensive as might be expected ! To add to his misfortune his case, complete with personal accessories, disappeared from the field. Its return *via* the AEROMODELLER would be much appreciated, should anyone have found same.

Trevor London, flying a smart-looking high-wing cabin job on behalf of Norman Lees, made a spectacular one-wing take-off. At this stage the crowd intervened. Result : a fractured leading edge and a good flight ruined. Something should certainly be done about this question of spectators. It was the main bugbear of pre-war meetings, and looks like carrying on into post-war competitions, unless some definite action is taken by the organising body.

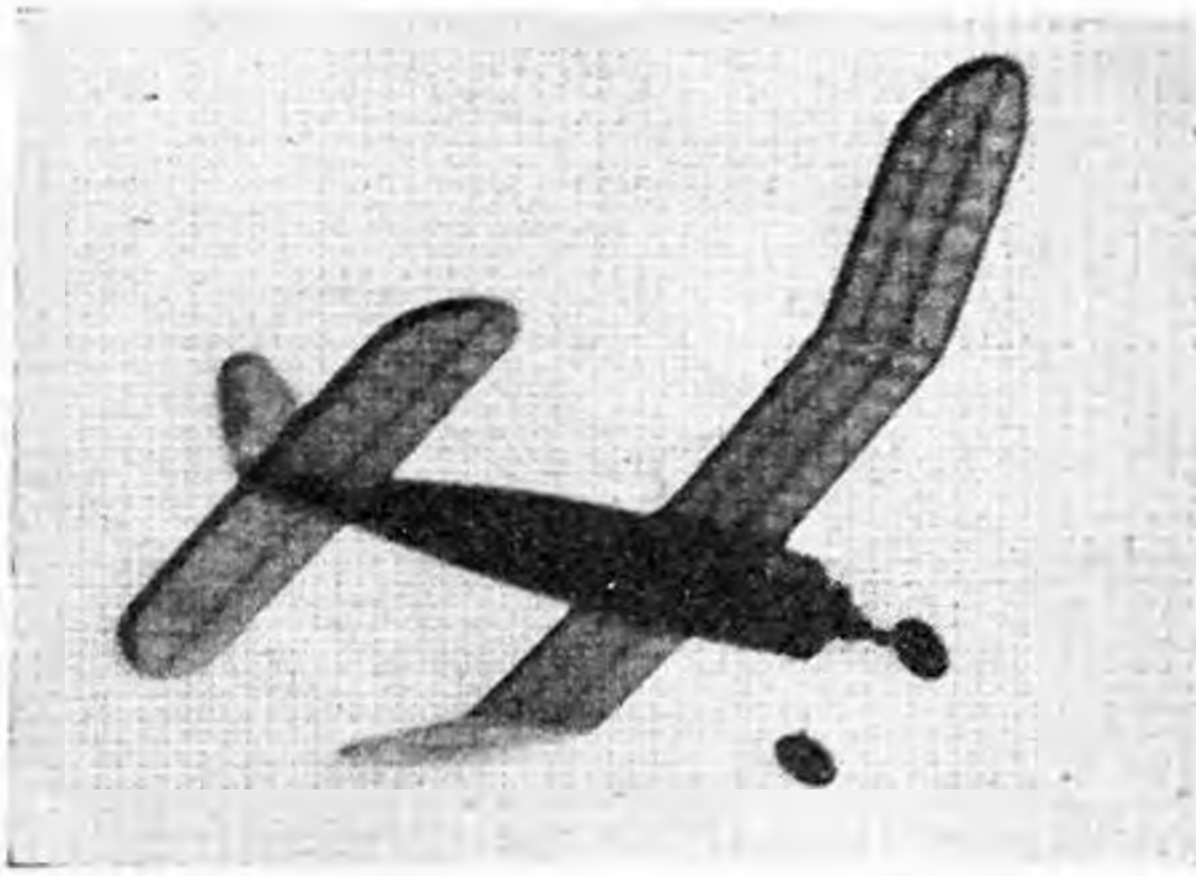
H. Scarth, of Bradford, got away with two steady take-offs, but in each case failed to gain sufficient height before turning down wind, with the usual results. Another Bradford man, S. Silvio, demonstrated the best method of winning contests under adverse weather conditions. His machine, a 5 ft. 6 in. span "Indian Chief," climbed steeply and kept on climbing until the motor cut, when it produced a nice steady flat glide, which won him the cup. This he received at the hands of Mr. A. F. Houlberg, Chairman of the S.M.A.E. A well-earned success.

K. N. Ballisat, of Cheam, had a motor that just "wouldn't." It fired but refused to run. Not so A. Crips, whose motor, an Ohlsson 23, fairly screamed out the revs. *His* trouble lay in the model, which just refused to "unstick" and after repeated ground loops, to the peril of all and sundry, did eventually get off the deck, only to repeat the process at heights varying from two to ten feet. This completely cleared the course of spectators in a matter of seconds and so executed a job the officials found impossible.

For security reasons it is impossible to describe the actual weather conditions, but it must have been awful wet in the Straits of Dover on September 3rd, 1944 !

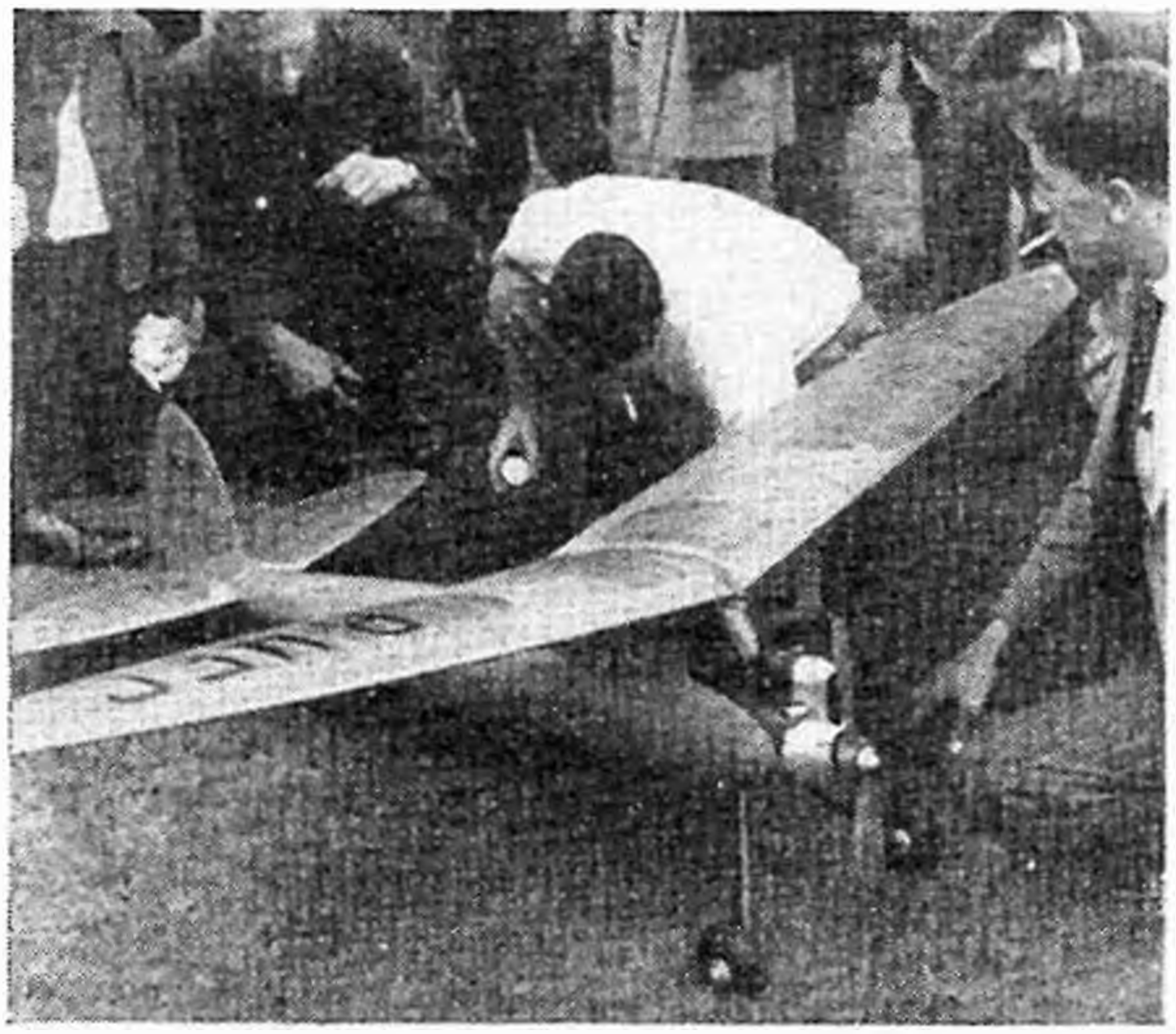
RESULTS

Competitor	Club	Flights			Total Error	Position
		1	2	3		
M. W. White	Blackheath	—	—	—	—	—
D. R. Birchall	Bradford	9·8	—	—	125·2	—
T. London	Bradford	29·8	—	—	105·2	3
S. Silvio	Bradford	60·4	35·75	21·6	17·25	1
H. Scarth	Bradford	7·0	9·0	—	119	—
A. Crips	Bradford	—	—	—	—	—
K. N. Ballisat	Cheam	—	—	—	—	—
S. G. Wyer	Cheam	38·0	44·4	—	52·6	2



"Picture Post" Photo.

S. Wyer's 6 ft. span job powered with an Ohlsson 60. In spite of motor trouble earlier in the day this machine eventually performed two excellent flights which won its owner second place in the competition.



"Picture Post" Photo.

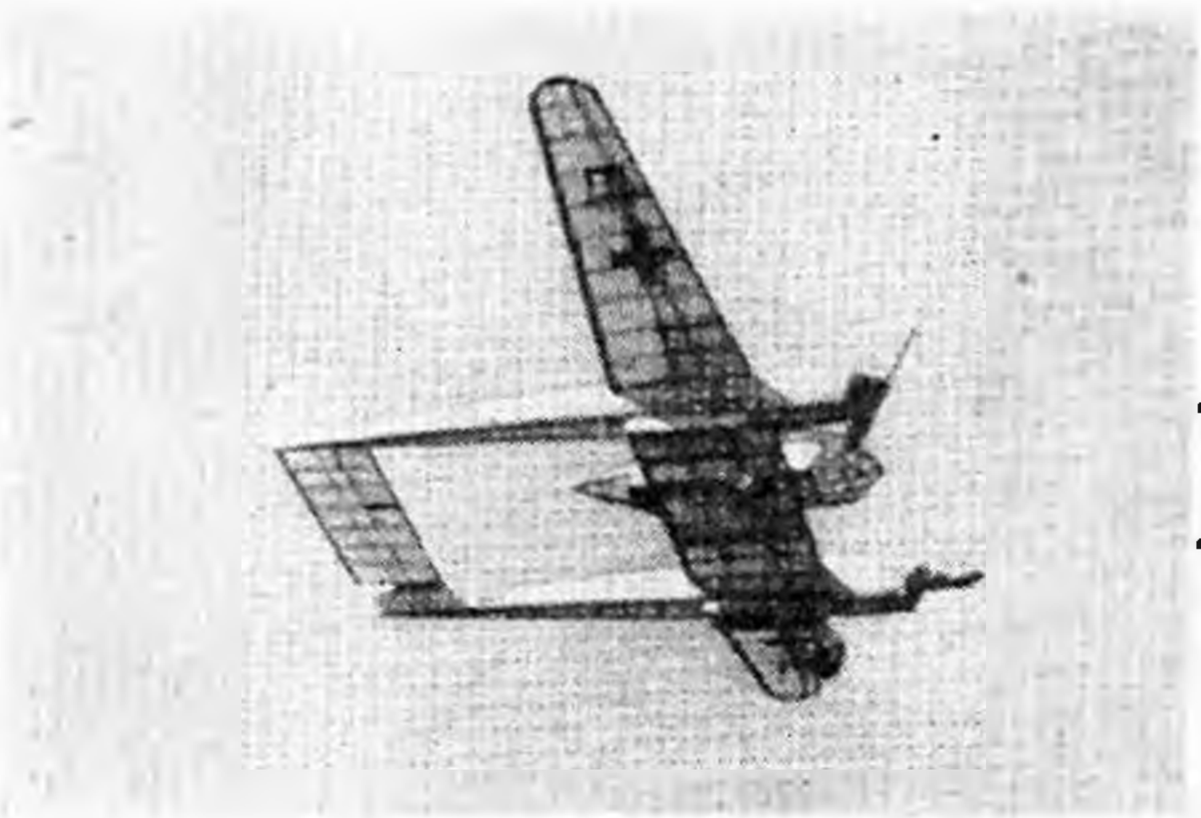
Above is Bill White and his 7 ft. span machine, not forgetting brother, who gave noble assistance. The model, of outstanding construction is red silk covered with monocoque fuselage and a pylon wing. It is powered with a 10 c.c. Brown Junior.

Below D. R. Birchall ruefully surveys the "bits and pieces." Results of a wing coming adrift when the model was well up.

"Aeromodeller" Photo.

MONTHLY . MEMORANDA .

BY O . G . THETFORD



A well-built and photographed 60" span flying scale model of a Fw 189 by N. Garnett of Bristol. This model equals many a solid in scale appearance.

Yellow-Belly Modes.

Since the early summer of 1944 reports have been reaching us, and we too, have observed, that the markings of British training aeroplanes have undergone a change. No official statement has been issued by the Air Ministry at the time of writing.

The chief feature of the new markings is the additional use of training yellow on the upper surfaces. A wide yellow band encircles the rear fuselage forming a background for a red, white and blue roundel. The yellow outer ring is obviously no longer required. The upper surfaces of the wing tips are painted yellow, this being a reversion to a scheme current in 1939 when camouflage was first introduced on training types which had hitherto been yellow all over, as at present in Canada. Twin-motor trainers, such as the Anson and Oxford, have the nose painted yellow and single-motor types such as the Magister and Proctor have been seen with the removable side panels of the Gipsy motor painted yellow. The machine identification letter or number is usually painted against the yellow patch at the side of the nose. The rest of the trainer camouflage system is unchanged. The upper surfaces and sides of the fuselage are camouflaged dark earth and dark green and the under surfaces training yellow. The serial number of the aircraft is painted in black beneath the wings and on the rear fuselage in black or training yellow. Trainers used for night-flying (particularly the Oxford) are painted night black underneath.

A rather unusual feature has been noted on certain Fairchild Cornell elementary and intermediate trainers in Canada. Although these machines are training yellow all over, the red and blue roundel is painted above the wings on many of them.

U.S. Camouflage Nomenclature.

We are indebted to the Public Relations Office of the U.S.A.A.F. for information concerning the camouflage colours used on American aircraft in Europe and North Africa prior to the spring of 1944, when all camouflage was abandoned.

Hitherto, the official descriptions of U.S.A.A.F. camouflage have been withheld. U.S.A.A.F. aircraft operating from Great Britain during 1942–43 were camouflaged on the upper surfaces in " Dark Olive Drab " or " Medium Green " and the lower surfaces were painted " Neutral Grey." U.S.A.A.F. aircraft operating in North Africa were painted " Sand " all over. The latter colour is not unlike our own " Middle Stone."

Camouflage is still retained on certain U.S.A.A.F. aircraft in overseas theatres, but details are restricted. It is, however, permissible to reveal that certain aircraft used for photographic duties, such as the F-5 Lightning, are painted a special shade of blue all over. This blue is of a pale shade and rather similar to the British camouflage colour known as " Sky Blue."

More Invasion Stripes.

Further information on the " invasion stripes " painted on Allied aircraft has come to hand since the full account was published in these columns in the August issue. Aircraft types carrying the stripes in addition to those tabulated previously include the Grumman Wildcat of the Fleet Air Arm, also used as a landplane fighter and fighter-bomber by a Canadian squadron in Normandy, the Vickers-Armstrong's Spitfire XI photographic reconnaissance version, the Bristol Beaufighter X of Coastal Command and the veteran Avro Anson, the latter being engaged on communications and transport duties between Great Britain and Normandy.

The two standard American heavy bombers, the B-17G Fortress and the B-24H and J Liberator, were also marked with " invasion stripes," many of the Liberators having the fuselage stripes painted longitudinally beneath the belly amidships instead of round the rear fuselage. Another deviation from the standard system of painting stripes has been observed on the Typhoon of the 2nd T.A.F. On Typhoons of " HH " Squadron (formerly equipped with " Hurribombers ") the stripes on the fuselage are painted on the undersurfaces and terminate about a third the depth of the fuselage up the sides.

Why White ?

A scrap of dialogue from a recent B.B.C. feature programme about the work of Coastal Command gave some interesting information on the reasons for the use of the white camouflage on machines of this Command. Apparently, white is the ideal colour for rendering aircraft well nigh invisible to submarines during the bombing run. It was first introduced in the summer of 1942 and has since been used on every type of aircraft used by Coastal Command including the Fortress II, Liberator VLR, Hudson, Beaufort, Hampden, Wellington, Whitley VII, Halifax, Manchester and Baltimore landplanes (the latter in the Mediterranean area) and the Catalina, Mariner and Sunderland flying-boats. The white camouflage has also been applied to those aircraft of the Royal Navy (Fleet Air Arm) attached to Coastal Command for anti-submarine patrol. White-painted Fleet aeroplanes include the Fairey Swordfish (with rocket projectiles) and the Fairey Albacore.

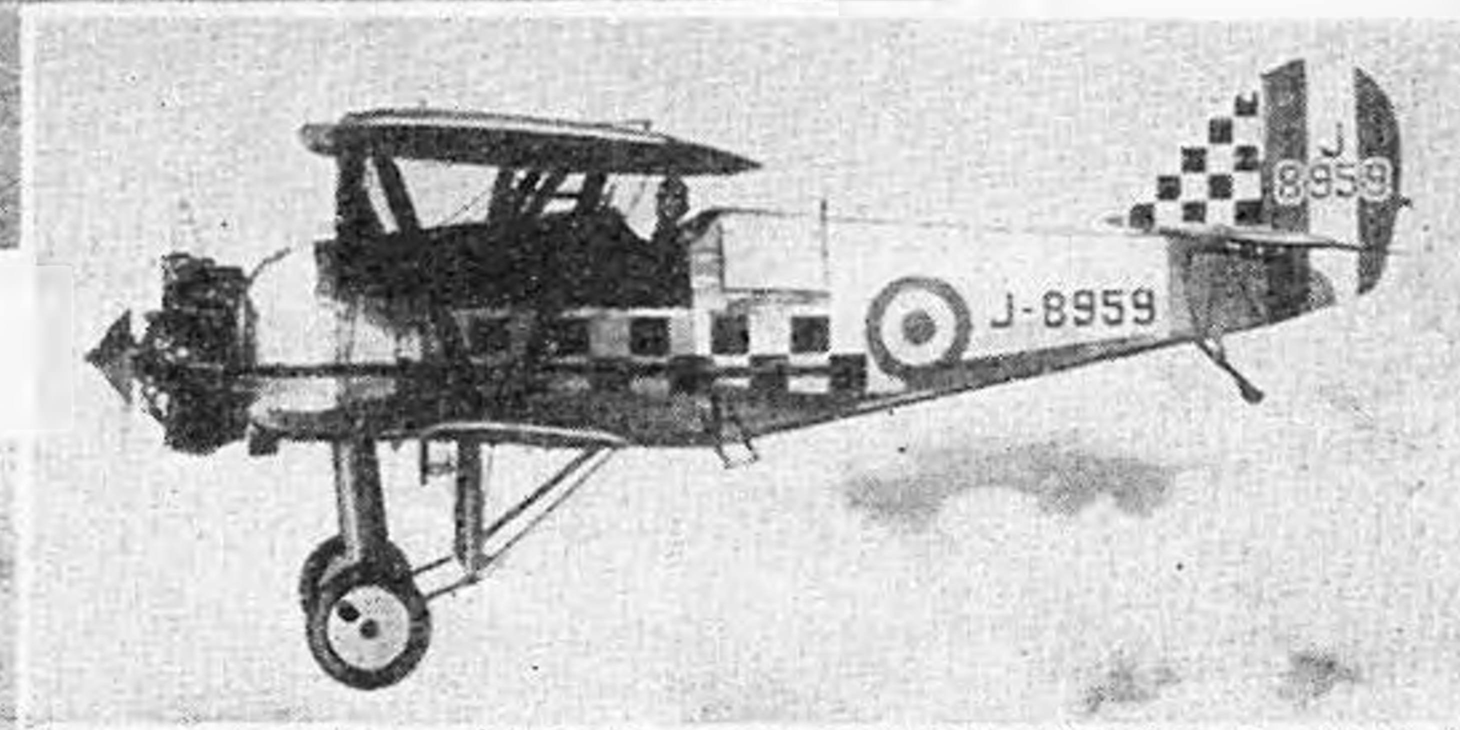
It is to be noted that there are certain exceptions to the above scheme in Coastal Command types, notably fighters such as the Mosquito and Beaufighter and certain flying-boats. Coastal Command fighters are camouflaged in Sea Grey Medium on the undersurfaces, not white. Flying-boats for certain duties are painted blue all over.

"PHOTONEWS"

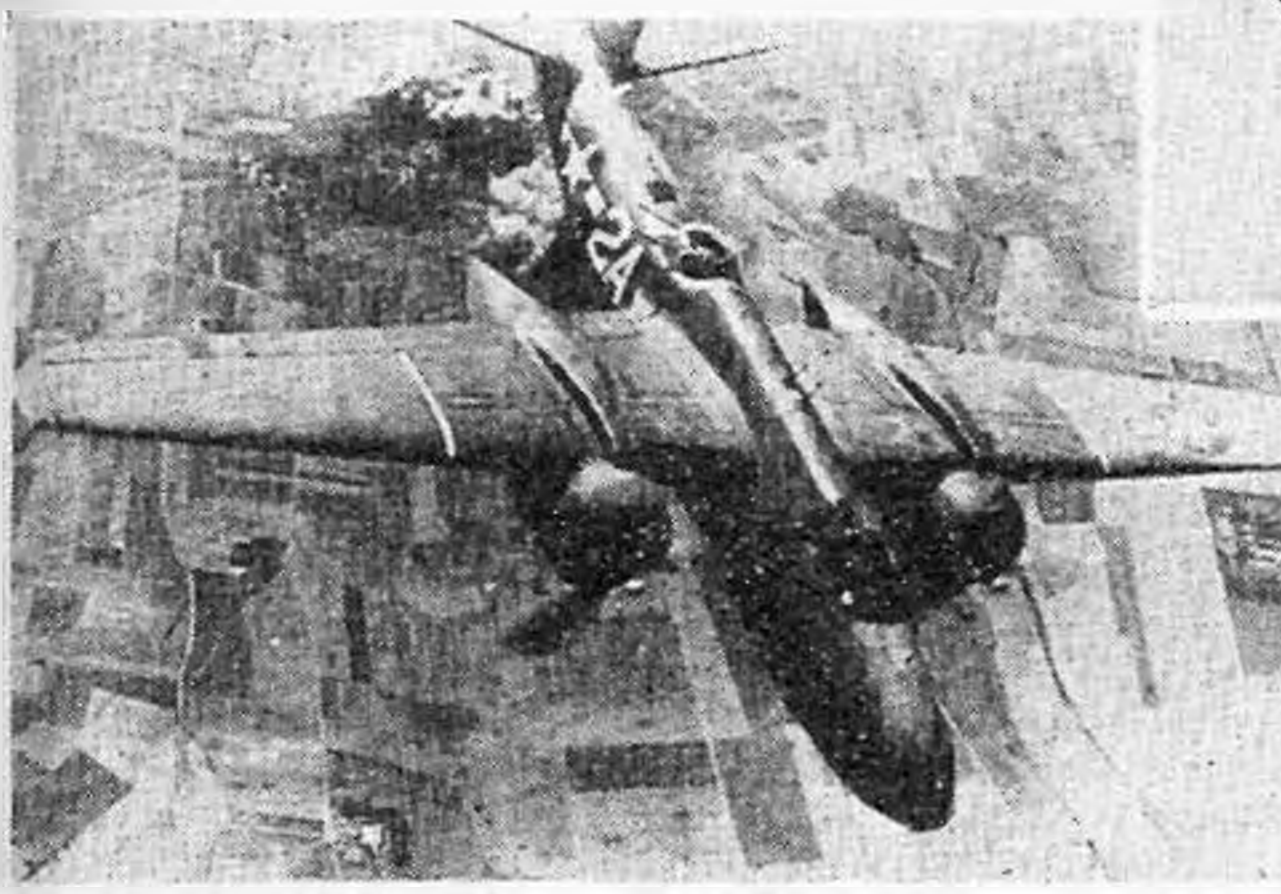
On the left is the latest enclosed version of the Boeing (Stearman) PT-27 supplied to the Royal Canadian Air Force. (Boeing photo.)

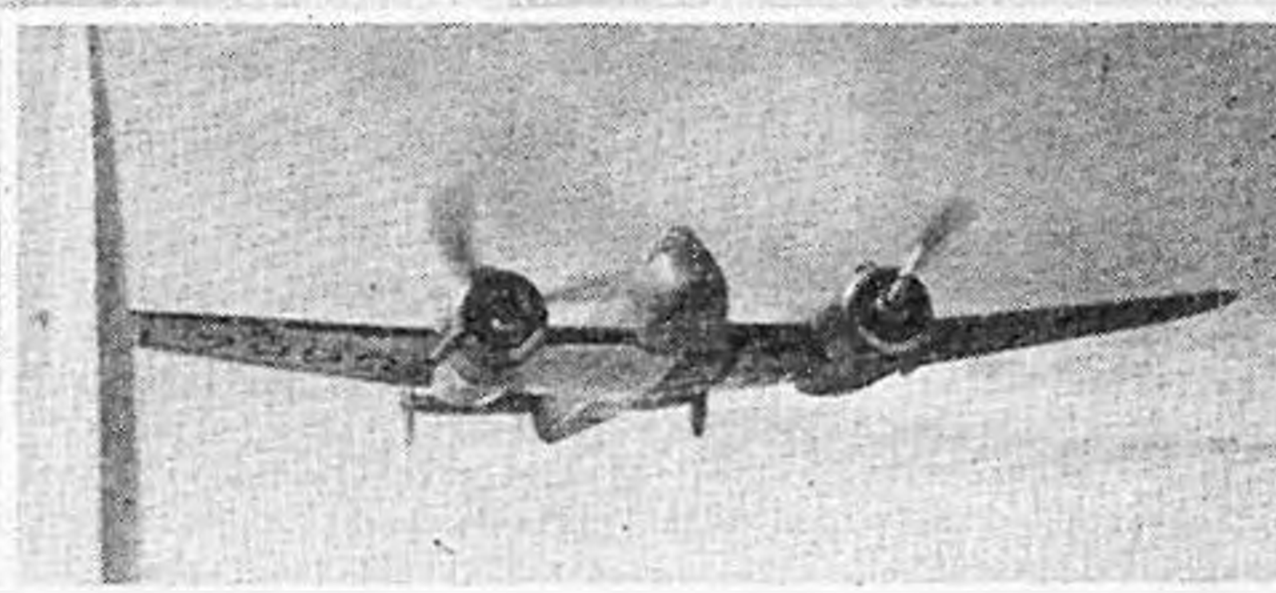
Below is a single-seat fighter of 1930. What is it, and what squadron does it belong to? ("Flight" photo.)

(See page 583.)



Havocs of the U.S. Army Air Forces are now fitted with two-gun dorsal turrets. The version below, the A-20G, has a 'solid' nose. R.A.F. versions have transparent noses. (Photo: O.W.I.)





Top (right) is the Gloster F.9/37 two-motor fighter of 1939. It did not go into production. (Photo: "The Aeroplane.")

The Curtiss P-40E (Allison) above, now has increased fin area for better stability. (Photo: Planet News Ltd.)

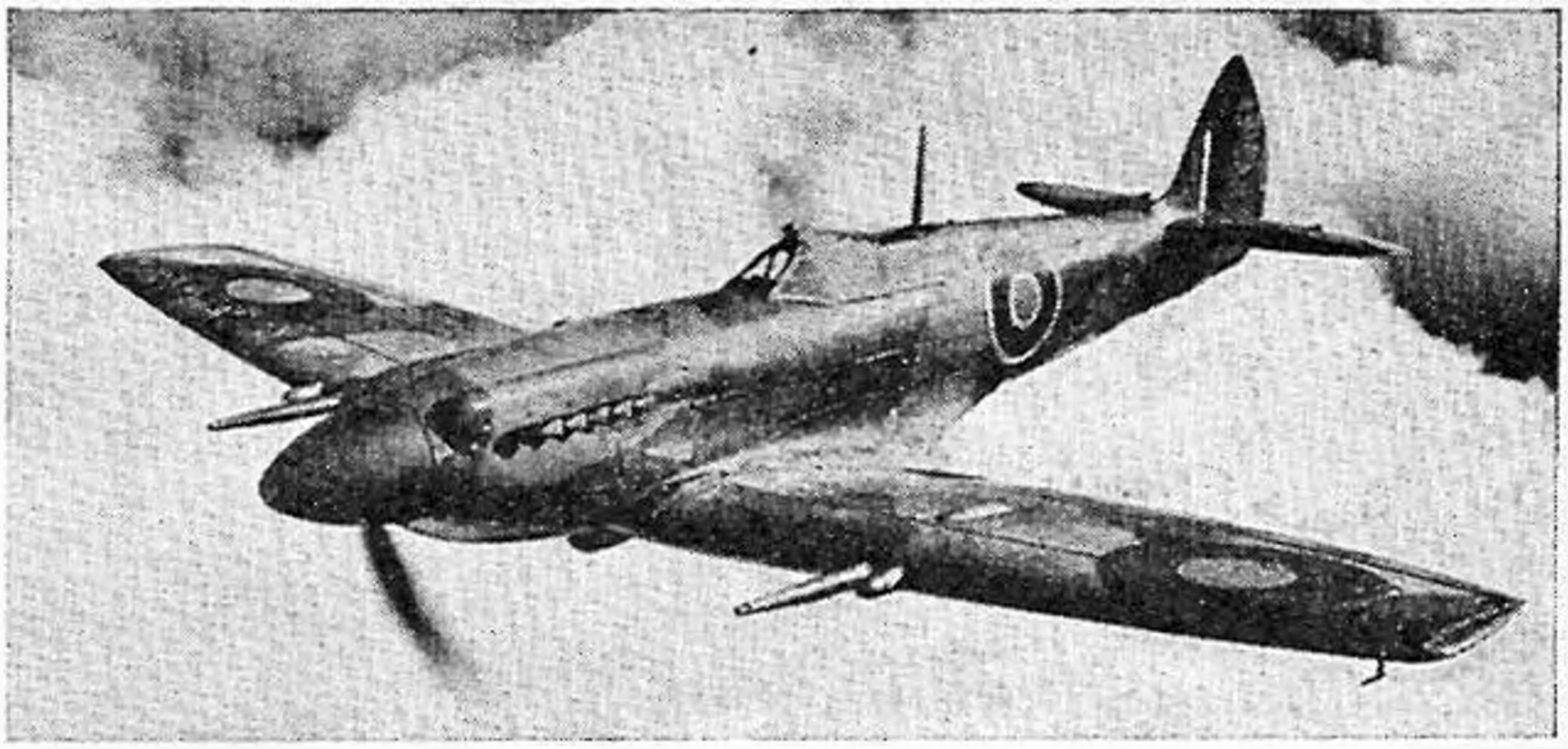
Many readers have observed a Messerschmitt Me 109E flying with British markings. The photograph above (right) shows the captured machine now flying in this country. (Photo: M.A.P.)

A new picture of the Lockheed C-56 Lodestar which is operating in large numbers on military transport work. (Lockheed photo.)

THE VICKERS-ARMSTRONGS SPITFIRE XII

BY H. J. COOPER

Next Month: The Boeing P–26.



SINCE the Spitfire prototype, built to Air Ministry specification F.36/34, first flew early in 1936 the design has undergone many changes which have been dictated by operational requirements or are the result of research and development.

Like every other operational aeroplane, the Spitfire has been improved from time to time by increase of power, armament, and other aerodynamic amendments, and the latest version which may be mentioned, the Mk. XII, has changed so completely that it bears little resemblance to the original design.

The Mk. XII is the first of the series to make use of a new motor, the Rolls-Royce Griffon, all previous versions being fitted with the Merlin. This modification has resulted in a distinctive nasal shape, with two long blisters housing the cylinder banks, and the thrust line is a few inches lower. The spinner is longer and of greater diameter than that of earlier types. A four-bladed Rotol airscrew is fitted, and it will be noted that the Griffon motor rotates left-hand instead of right-hand as does the Merlin.

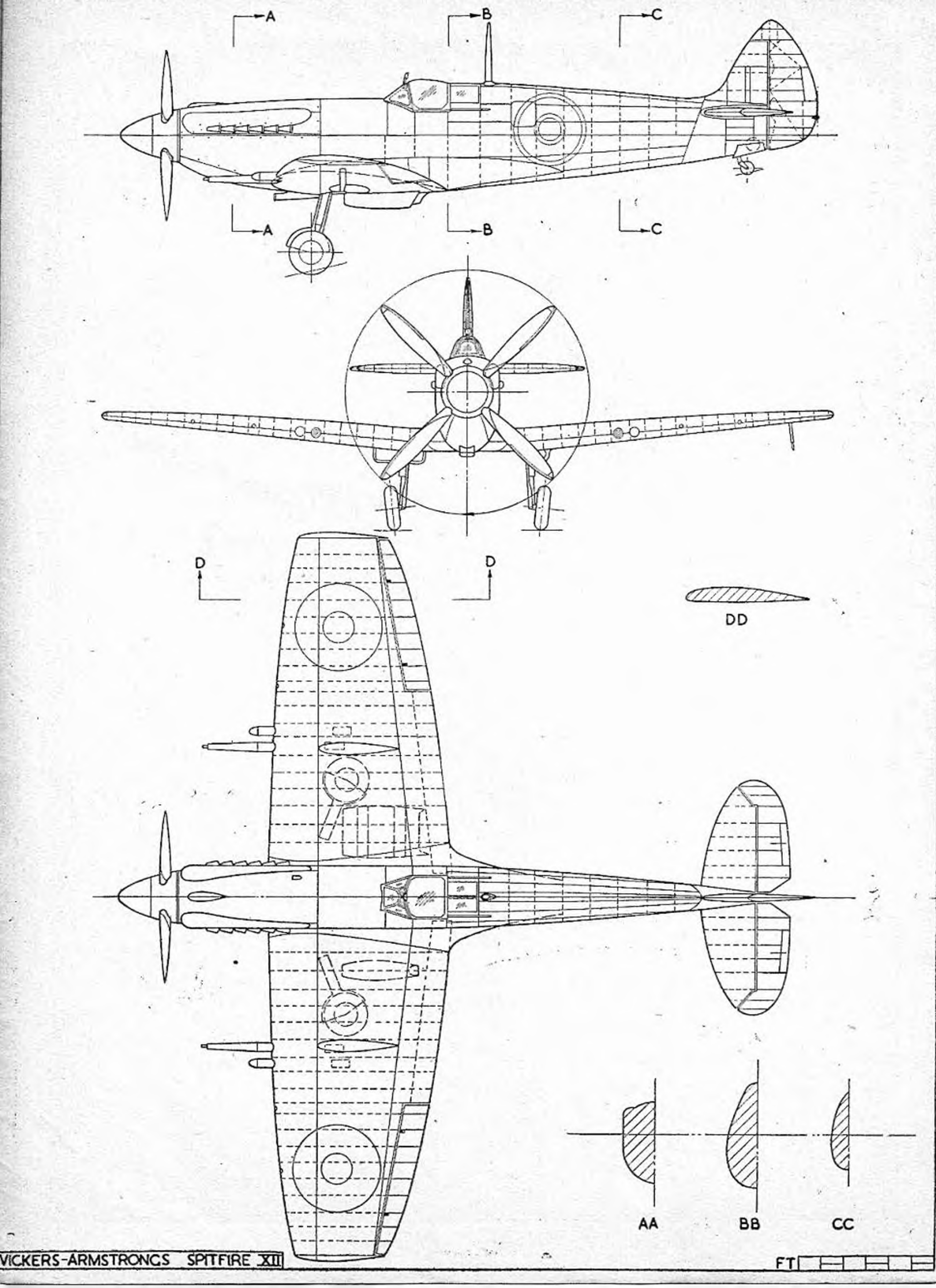
Next important of the features of the Mk. XII is the clipped wing, first seen on the abortive Mk. III and later on the modified Mk. Vs. The decreased wing area, effected by the removal of the tips and the fitting of wooden stubs, is to give the Spitfire a greater speed at low levels. High-level fighting is left to the versions with normal wings. At one period certain versions, notably the Mk. VII, were fitted with pointed wing-tips, but these have now been abandoned and all Mk. VIIs are now fitted with the normal elliptical tips, so that in appearance they are identical with the Mk. IX. The rudder of the Mk. XII has been modified; it now has a pointed tip and a slightly increased chord.

Main dimensions of the Mk. XII are: Span, 32 ft. 6 in.; length, 31 ft. 2 in.. Mk. XIIs were first used in the spring of 1943. They are coloured in Fighter Command camouflage with dark sea grey and dark green on the sides and upper surfaces, and are sea grey medium underneath. The usual roundels and fin marking are carried, and squadron letters are painted in light blue-grey.

A brief summary of the various Spitfire versions follows:—

Mark.	*Motor.*	*Airscrew.*	*Armament.*	*Speed.*	*Remarks.*
Prototype	Merlin	2-bladed wooden	—	342	—
Mk. I	1,030 h.p. Merlin II/III	2-bladed wooden	Eight Browning	362	First production model.
Mk. I	1,030 h.p. Merlin II/III	2-bladed metal	Eight Browning	367	—
Mk. II	1,250 h.p. Merlin XII	3-bladed metal	Eight Browning	375	Domed cockpit cover.
Mk. III	1,145 h.p. Merlin X	3-bladed metal	2 Hispano, 4 Browning	—	Three built. Clipped wings.
Mk. IV	Merlin	3-bladed metal	None	407	PR version.
Mk. V	Merlin XLV	3-bladed metal	2 Hispano, 4 Browning	387	Now with clipped wings.
Mk. VI			NOT RELEASED		
Mk. VII	2,060 h.p. Merlin LXI	4-bladed Rotol	2 Hispano, 4 Browning	—	Twin radiators. Formerly with pointed, now with normal wings.
Mk. VIII	Merlin	4-bladed Roto	2 Hispano, 4 Browning	—	Pointed rudder. Tropical.
Mk. IX	2,060 h.p. Merlin LXI	4-bladed Rotol	2 Hispano, 4 Browning	—	Twin radiators.
Mk. X			NOT RELEASED		
Mk. XI	Merlin	4-bladed Rotol	None	—	PR version. Bulged nose.
Mk. XII	Griffon	4-bladed Rotol	2 Hispano, 4 Browning	—	Clipped wings.

British Official Photographs.



VICKERS-ARMSTRONGS SPITFIRE XII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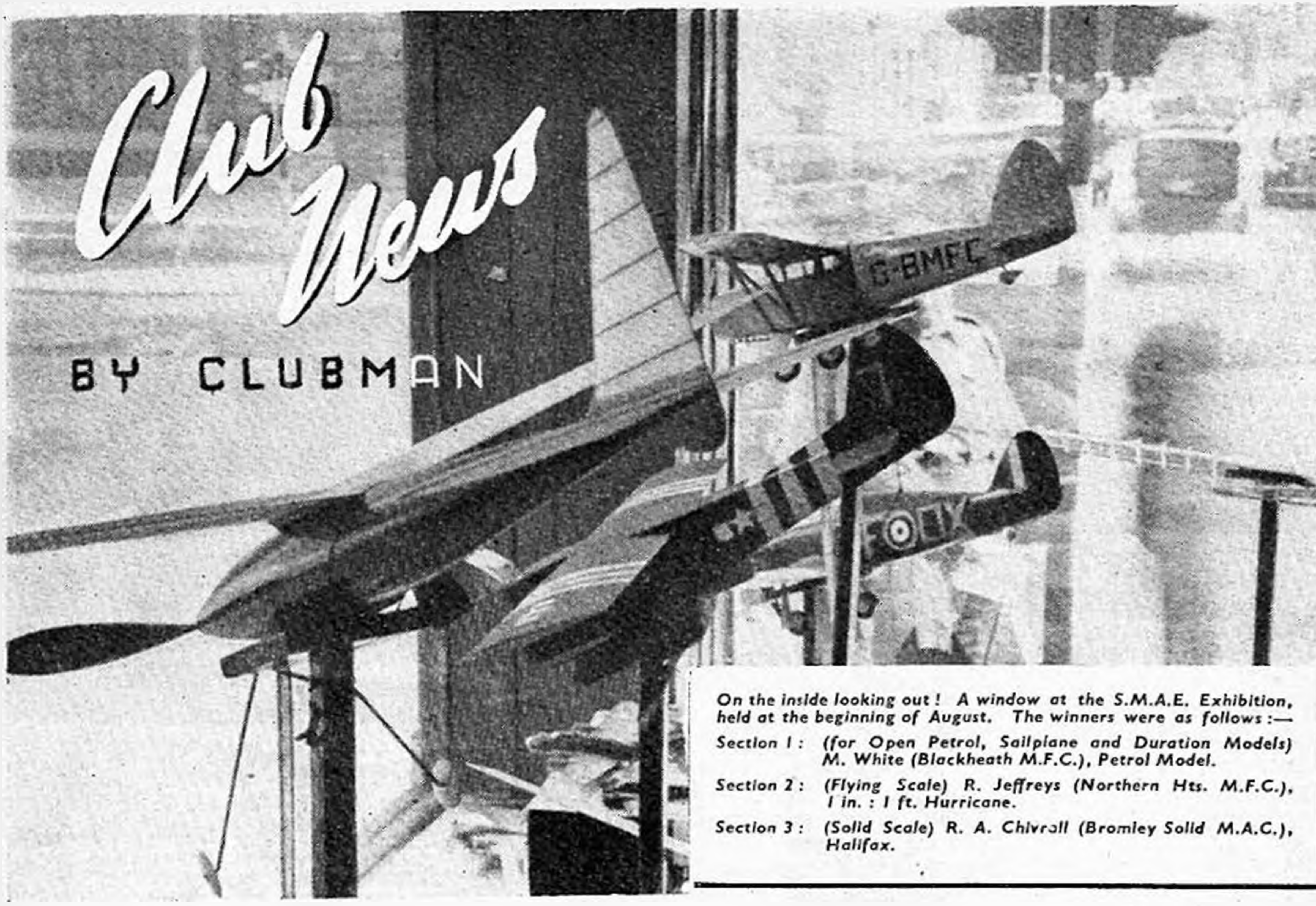


On the inside looking out! A window at the S.M.A.E. Exhibition, held at the beginning of August. The winners were as follows:—
Section 1: (for Open Petrol, Sailplane and Duration Models) M. White (Blackheath M.F.C.), Petrol Model.
Section 2: (Flying Scale) R. Jeffreys (Northern Hts. M.F.C.), 1 in. : 1 ft. Hurricane.
Section 3: (Solid Scale) R. A. Chivrall (Bromley Solid M.A.C.), Halifax.

AT long last I am pleased to announce that a competition day dawned fine and clear—and remained that way all day!! Wonders will never cease. The great occasion was the 13th August—anything but an unlucky day—and the times put up as a result for the M.E. No. 1 Cup event are terrific, to say the least of it. The appended list shows the placings of the top six clubs.

M.E. No. 1 CUP

Pharos M.A.C.	**3766·9 secs.**
Surbiton M.A.C.	**3076·0 ,,**
Croydon M.A.C.	**2993·9 ,,**
Northern Heights M.F.C.	**2984·0 ,,**
Walthamstow M.A.C.	**2806·8 ,,**
Luton M.A.C.	**2449·0 ,,**

So far I have only the preliminary results to go on, so do not know the number of clubs who competed, but it is strange to find that all the top placers are from the London area. Pharos have again pulled it off with a remarkable total of over 62 minutes for the team, but the laurels go to H. R. Turner of the Northern Heights Club, who made the best time of the day with 31 : 05. I am out of touch with the national records situation at present, but have an idea that this is in the nature of a new record for the class.

History has been made this month, when the first petrol model contest since the commencement of hostilities took place on the Birmingham Club ground at Sutton Park. (*See pages* 552, 573) "Petroleering" is undoubtedly the phase of aeromodelling that will see the greatest boost in peace time, coupled no doubt with worth-while radio control, and I look forward to the day when our models both look and fly like the real thing, and are also continuously under control from the ground.

Members of the SURBITON & D.M.A.C. flew against the Pharos boys in a round of the London Challenge Cup, and though beaten by 1518·4 points to 1121·8, D. Butler put up the best time of the day. His "Ranger" went into a cloud after a soaring flight of 7 : 10, and was recovered from 12 miles away, having been airborne for 2 hours 25 minutes. Weather for the M.E. No. 1 event was ideal, and three of the four team members' models were lost. D. Butler again lost his model after a flight of 14 : 50·5, D. Lillystone (a junior member) followed suit after 9 : 06·7. Another junior, J. Gamman, then lost his model after a time of 6 : 29·4, and finally N. Groves—who made some very consistent flights—made his best time of 4 : 25.

The SPELDHURST (Kent) M.A.C. have been running dances during the winter months, and building up a sound finance in order to ensure a real bumper start after the war. An open duration contest held recently was won by D. Turley with a time of 2 : 45, the club record now standing at 7 : 35.

In the Flight Cup event, the weather misled the BRISTOL & WEST M.A.C. into flying off under very damp conditions with very threatening rain clouds, these clearing immediately flights were completed, leaving a very warm and sunny day! B. Morgan—a junior member—clocked the best aggregate of 2 : 10·8, and later in the day made a better flight of 1 : 50. Other members were not so good, most models seeming longitudinally unstable. Gutteridge weather was warm and sunny, with a slowly freshening breeze. Instructions were received from the local farmers that excursions

All ready to go! A member of Cheam M.A.C., with a modified Ivory Gull on the towline, photographed during the M.E. No. 1 Cup contest at Epsom.

"Aeromodeller" photograph.

into the surrounding cornfields were not permissible—so models promptly landed right in the middle of said "soft landing." C. S. Wilkins clocked 3 : 42·5 on his first flight, then lost the model in the corn after a flip of 1 : 28. A. H. Lee (who placed second in the final results) also found cornfields on his first two flights, but managed to get the farmers to relent a bit. He was flying his shoulder-wing streamliner, and put up an excellent performance, losing his model on the last flight with 5 : 59·1—the model being recovered in the evening after being gently—but thoroughly—licked by cows. The club's M.E. No. 1 team all flew "Beaugliders," the weather being sunny with an extremely variable breeze. M. Garnett put up the best aggregate of 3 : 27, but it was evident that the best performances were not being obtained with gliders, though times have almost trebled since the 300 ft. line was re-introduced. The club flying scale contest was held on the same day, and attracted ten entries, ranging from three Fairchild Cornells to a Fokker D.8 built from A.M. plans. The latter model put up the best time of 1 : 14·8, builder being M. Garnett. K. Moon flying a Cessna came second with a time of 1 : 00·8.

The THAMES VALLEY M.A.C., after a period of inactivity owing to flying bomb visitations, resumed flying for the M.E. No. 1 event, the weather being unusually good. The club glider record was broken three times during the course of the afternoon, first by J. M. Stevens with a time of 2 : 36·8, this immediately being beaten by P. Harmes' 2 : 43. Later Stevens again flew his model, taking the record with a flight of 3 : 33 o.o.s.

More models were lost at the AYLESTONE M.F.C. ground on the same day, three members losing their models. Best times were 3 : 33·4 by D. Bourne, 6 : 35·2 by S. Lacey, and 11 : 12·2 by W. Jones. The latter model came down 45 minutes later some 6 miles away. The club totalled 2,228·9 seconds.

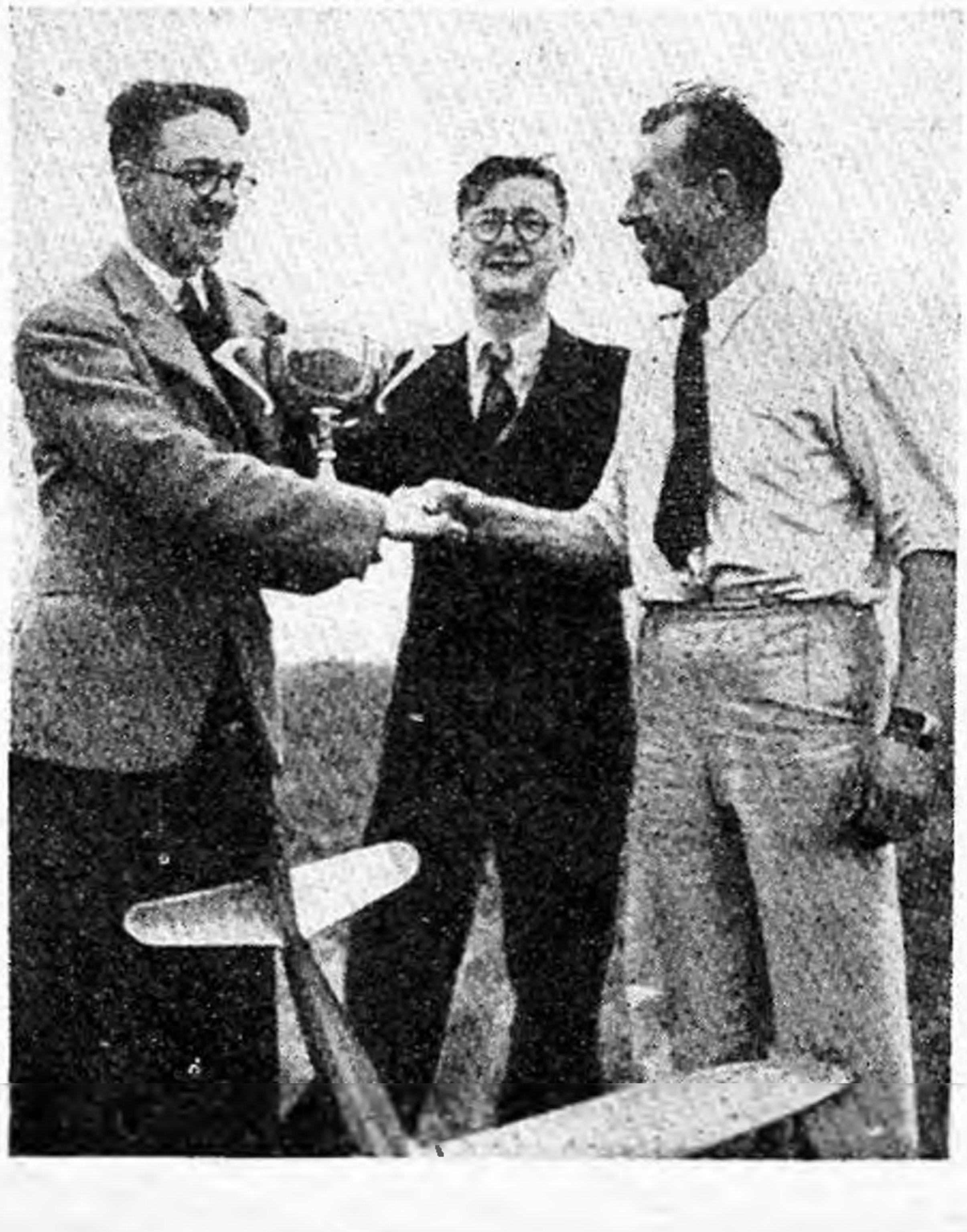
1929 Squadron A.T.C. (MORETON) are holding two open competitions on the 8th and 12th October, the first for flying scale models, and the second for solids. Entries are welcomed, and intending competitors should contact the secretary of the model aero section, R. H. Dodd, 26, Briscoe Drive, Moreton, Wirral.

The rally staged by the LEEDS M.F.C. was well supported, entries being received from Bradford, Doncaster, Ilkley and Leeds Clubs. Weather was fine though a trifle windy, and owing to lack of a home ground, flying took place on Ilkley Moors. Thermals were abundant, and o.o.s. flights were two a penny, J. Capel's glider making three o.o.s. flips in the same contest, times ranging from 2½ to over 4 minutes. Results :—

Open Duration.	E. Jackson (Leeds)	3 : 46·9
	D. Coveney (Leeds)	3 : 31·9
	B. Fox (Doncaster)	2 : 42·3
	(Best flight : B. Fox, 2 : 08·8.)	
Over 40 in. Glider.	S. Silvio (Bradford)	7 : 32·0
	E. Jackson (Leeds)	3 : 52·1
	J. London (Bradford)	3 : 44·1
	(Best flight : S. Silvio, 4 : 23·8.)	
Under 40 in. Glider.	J. Capel (Leeds)	9 : 50·1
	H. Tubbs (Leeds)	3 : 03·8
	(Best flight : J. Capel, 4 : 04·7.)	

Although Silvio's time was the longest in sight, Tubbs' model—which flew o.o.s. after 3 : 03·8 on its first flight—landed on Sherburn aerodrome, 26 miles from Ilkley, and was returned undamaged to its owner.

Fifteen-year-old Ron Jesson has broken the EAST



Winners both! S. Silvio, of Bradford, congratulating T. London, 1944 "Silvio" Cup winner, after he had received the cup from R. Gallagher, the 1943 winner, in the centre.

BIRMINGHAM M.A.C. record with a flight of 30 minutes, flying a model of his own design—the "Gremlin." A younger member, twelve-year-old B. Harrison, raised the glider record to 1 : 20·4 with an "Aegeus." The standard of workmanship of both models is very high, and gives the answer to those clubs who put a minimum age on prospective membership!

High times have been appearing in the DONCASTER & D.M.A.C., best to date being 5 : 36 by Mick Heatherington, flying a lightweight power job, and 5 : 47·2 by J. Broadhurst's "Elite No. 1" flying from a 75 ft. line. This club intends holding a rally on the 17th September, and all interested are asked to contact F. Gearing, South View, Cadeby Road, Sprotborough, Doncaster.

Rough weather has prevented very high times with the AGRICOLA M.A.C., but J. Owen has managed to break the club record twice with two consecutive flights, times being 1 : 25 and 1 : 35. E. N. Johnson, a junior member, holds the glider record with a flight of 1 : 22·8 tow launched.

A neighbouring club—BLACKPOOL & FYLDE M.A.C.—held a novel type of contest in which wing loading and power/weight ratio were taken into count for bonus points. Results were :—

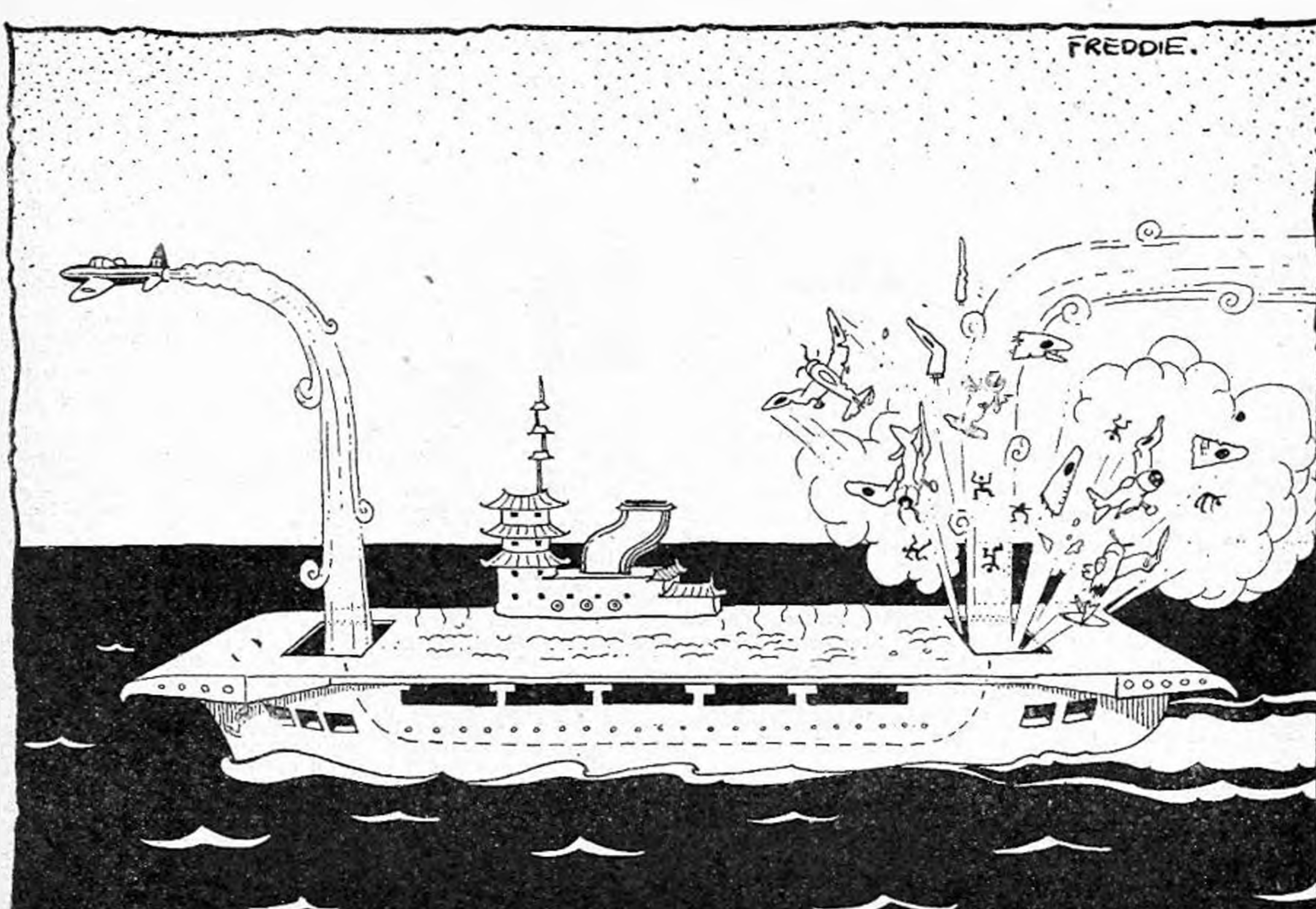
	Wing Area	*Weight*	*Rubber*	*Duration*	*Total*
J. P. Baldam	122 sq. in.	5¼ oz.	1 oz.	156·5	236·5
R. Ellis	106 ,,	3½ ,,	1 ,,	173·9	203·9
D. Whittaker	115 ,,	3 ,,	¾ ,,	161·2	181·2

In order to increase club activities, it has been decided to include model engineering in the club affairs, particularly in view of the increasing affinity of aeromodelling and engine-cum-radio work.

The BIRMINGHAM M.A.C. rally held on 23rd July brought in over forty entries for each competition. Good weather was taken full advantage of with the following results :—

Duration R.O.G.	
D. W. Harrison (Birmingham)	11 : 29·5
E. Kendrick (Birmingham)	7 : 01·5
F. Parkin (Birmingham)	5 : 13·1
F.A.L. Glider, 300 ft. Line.	
D. Blair (Birmingham)	4 : 50·1
C. Caddick (Penn)	3 : 10·8
P. Fisher (Penn)	3 : 02·8
Open Glider.	
R. Perry (Birmingham)	10 : 36·1
R. Monks (Birmingham)	10 : 15·3
J. Errington (Penn)	9 : 46·2
Nomination.	
S. Millard (South Birmingham)	
V. Phillips (East Birmingham)	
E. Kendrick (Birmingham)	

The team competitions held in conjunction with the above resulted in a win for Birmingham with 1640·6 points, followed by Penn M.A.C. 832·6, and South Birmingham M.A.C. 506·3.



ATTACK ON A JAPANESE CARRIER WITH A JET-PROPELLED AIRCRAFT

Snapped at the Sir John Shelley Cup. Trevor London holding up Norman Lees 4' span model for inspection. This machine of extraordinary clean design is powered with an Ohlsson 23.

The WHITEFIELD YOUTH MOVEMENT M.A.C., after contributing largely to the formation of the Northern Area Council, have now produced their own club magazine—quite interesting and packed with "gen." Entry into national contests has not met with much success owing to the type of weather usually encountered in that district, but some goodish club records show that good times can be obtained on occasion. Most of the records clock around the minute mark, but two—5 : 30 by D. Cookson's glider, and 5 : 05 by J. Lloyd's "under 100 sq. in." duration job—being outstanding.

Extraordinary times have been set up recently in the PENN M.A.C., records to date being :—

Glider (tow launch)	S. Ward	10 : 00 o.o.s.
Glider scale (Horsa)	G. Caddick	4 : 00 ,,
Glider (winch launch)	N. Parsons	6 : 30 ,,
Glider, tailless	S. Ward	1 : 29 ,,

During a glider contest on the 6th August, R. Herrington flew his own design model o.o.s. for 8 : 15, while N. Cox won the junior event with a time of 3 : 45. P. Fisher lost his model after a flight of 9 : 50 in the M.E. No. 1 contest, team total being 1,599 seconds.

The BRADFORD M.A.C. contested the Gutteridge Trophy on Baildon Moor in a fairly strong wind, therefore times were not expected to reach the average. A junior Wakefield competition held on the same day resulted in T. Silvio beating last year's all-conquering junior, R. Gallagher, and thus wins his first cup.

The PORTSMOUTH M.E.S. wish all interested modellers in the district to get in touch with the club at the first opportunity. Funds are well established, and a club room is one of the first aims of the club under its new name.

Well, the year draws towards its close, and while the weather has again largely let us down, with the exception of one or two notable occasions, we still live in hope for better conditions as the years roll by. I hope to have full details of the S.M.A.E. petrol contest by the next issue, and—as this is written before that extra special event takes place—I wish the re-birth of such flying a healthy start and continued success. Let us hope that no shortsighted fatheads will jeopardise the future of such flying by breaking the few lenient rules. Till next month, good flying and no losses. THE CLUBMAN.

NEW CLUBS.

CATHCART & D.M.A.C.

J. McAleese, 43, Holmhead Crescent, Cathcart, Glasgow, S.4

MERTON M.A.C.

J. R. Roach. 93, Townshend Drive, Keyham, Devonport.

SECRETARIAL CHANGES.

WALLASEY M.A.C.

J. Inkester, 216, Wallasey Road, Wallasey, Cheshire.

REPORT ON THE DELEGATE MEETING HELD AT THE KING'S HOTEL, MANCHESTER, ON SUNDAY, AUGUST 20th,

SMAE

After the Secretary had read the Minutes of the previous Delegate Meeting, and "their adoption as read" had been carried, an application for a British F.A.I. Record "B" for Sailplanes was granted to Mr. G. Pickard, of the Cheam M.A.C. His model had made flight of 11 mins. 32·1 secs. on the 16th July at Epsom Downs, and the meeting heartily congratulated Mr. Pickard on his performance.

An Interim Report by the Secretary followed, and in his opening remarks Mr. Bell informed the meeting that the Council had insured every member belonging to the Society flying rubber-driven model aircraft and sailplanes, against third party risks up to £5,000. It was the Council's desire that all club secretaries should now provide the Hon. Treasurer of the Society with a list of names of members belonging to their clubs to enable him to complete his records. A policy covering those flying petrol-driven model aircraft was nearing completion and details would be published in the News or Journal as soon as possible.

Turning to competition matters, he suggested that it would be advantageous to review the type of contest programme that was to be followed during the 1945 season. He suggested that the policy of the Council during the last two years of encouraging the "open" type of contest had paid handsome dividends as hundreds of members had become "contest conscious" and had helped their Society in the financial sense by way of entrance fees into S.M.A.E. Contests. Now, however, the time arrived when we should incorporate in our flying programme a percentage of contests that leaned more toward the scientific. The adoption of the "pay load" type of contest would be a step in this direction.

It was also suggested that the creation of a National Regional Scheme should prove of great benefit to the movement, and it is intended to go all out for a very large number of Regional Committees, each able and willing to organise the flying of members of the clubs in their regions in S.M.A.E. Contests. This scheme would provide the compromise between the flying programme of to-day and the centralised contests of to-morrow, and would save time and postage expenses as each region would have its own Competition Secretary.

A long and interesting discussion followed, and although a few delegates advocated the retention of the "all-in open type" of contest, they recorded only a negligible vote against the following propositions which will go before the Annual General Meeting :—

1. That the Gutteridge Trophy shall have Pluggo Cup points.
2. That a pay load contest be instituted.
3. That the Flight Cup Models' weight be constructional.
4. That power (rubber) limitation be discussed at the A.G.M.

The delegates also recommended that all club members should pay 6d. each per annum to the Society for insurance cover when flying rubber-driven models and sailplanes.

A happy event at the meeting was the presentation of the Gamage Cup to Mr. R. F. L. Gosling, who collected the trophy for Mr. M. E. Davidson (Merseyside) and the Flight Cup to Mr. I. S. Cameron (Merseyside). The cups were presented by Mr. A. F. Houlberg.

Owing to Mr. L. G. Temple being called to H.M. Services, Mr. R. V. Bentley, Secretary of the S.M.A.E. Northern Regional Council, becomes Records Officer for the Society.

The Council would like to record its appreciation of the great kindness of our hosts, Mr. Currington and Mr. Lawton of the Whitefield M.A.C., whose arrangements helped so much towards the success of this meeting.

News was given in last month's issue of the Journal of the "Service Trophy," which is to be awarded to the serving member who records the highest time on an individual flight during the 1944 flying season. This will be open to both rubber-driven R.O.G. flights and those made by sailplanes launched from a 300 ft. line. Applications should be made to the S.M.A.E. Competition Secretary, Mr. H. J. Towner, "Trencrom," King's Drive, Eastbourne.

The S.M.A.E. Indoor Competition R.T.P. will commence in October under the same rules and conditions as last year. The S.M.A.E. Solids Contest will also be run in the same manner.

The North Kent M.A.S. will be holding a Flying Boat Contest for the C. H. Roberts Trophy shortly. The minimum wing area must be 150 sq. ins. and the model must have a minimum weight of 1 oz. for each 50 sq. ins. Minimum cross-sectional area must be L2/50. Full details can be obtained from Mr. T. Wickens, 73, Burnell Avenue, Welling, Kent. A Seaplane Contest is also arranged.

Cards setting out the Air Ministry Order, together with full details about the restrictions applying to the flying of ALL TYPES of model aircraft in various parts of the country, are now available on application to the Hon. Secretary or the Editor.

We would like to draw our members' attention to the fact that a copy of the S.M.A.E. News and the S.M.A.E. Journal are sent to each club secretary and every country member each month.

If you are not receiving your copy or change your address, write to the S.M.A.E. Press Secretary and Journal Editor, F. E. Wilson, 34, Babington Road, Hendon, N.W.4 (Hen. 7163).

LONDON AND DISTRICT INTER-CLUB CHALLENGE CUP

First Round. Flown off up to and including Sunday, August 6th.

	(1)	(2)	(3)	Total.
WALTHAMSTOW.				
Rubber—Dendrey	10·8	33·4	43·3	87·5
E. Aylwood	41·3	66·8	51·0	159·1
Glider— B. Alder	71·8	82·7	29·0	183·5
K. Smith	11·5	34·0	93·0	138·5
				568·6
CHEAM.				
Rubber—J. D. Palmer	211·0	8·5	7·5	227·3
F. H. Briggs	48·0	11·2	6·2	65·4
Glider— K. Ballisat	29·8	73·1	—	102·9
R. A. Birch	46·5	26·0	29.0	101·5
				497·1
BROMLEY.				
Glider— E. A. Walker	21·4	14·8	61·2	97·4
J. Gower	22·5	10·0	23·35	55·85
Rubber—W. Geddie	44·0	51·5	64·75	160·25
E. A. Walker	39·5	37·1	7·4	84·0
				397·5
BUSHY PARK.				
Glider— A. H. Taylor	46·8	30·6	37·7	115·1
M. A. Wright	89·0	122·0	69·5	280·5
Rubber—A. H. Taylor	37·8	47·0	37·6	122·4
M. A. Wright	161·0	65·0	120·4	346·4
				864·4
BRENTFORD AND CHISWICK.				
Rubber—A. Young	92·0	67·0	75·0	234·0
P. Gilbert	28·0	45·0	33·0	106·0
Glider— W. Marley	9·0	17·0	31·6	57·5
R. Connor	45·0	33·0	158·0	236·0
				633·3
NORTHERN HEIGHTS.				
Rubber—F. E. Wilson	105·0	119·0	164·0	388·0
D. Lofts	315·0	350·0	158·0	823·0
Glider— R. Copland	55·0	95·0	71·0	221·0
J. Davall	39·0	101·5	62·0	202·5
				1634·5
PHAROS.				
Rubber—A. Armes	120·0	99·0	64·9	283·9
J. P. Buckeridge	423·1	65·0	148·0	636·1
Glider— A. W. F. Alexander ...	39·1	15·2	60·0	114·3
K. C. Jenkins	244·5	173·6	66·0	514·1
				1548·4
SURBITON.				
Rubber—N. Groves	25·9	39·9	53·0	118·8
M. Hunt	29·8	31·2	40·4	101·4
Glider— J. Cheetham	92·1	118·0	124·0	334·1
D. Butler	137·5	430·0	—	567·5
				1121·8
BLACKHEATH.				
Glider— Eveson	98·75	79·0	117·0	294·75
Marney	46·75	46·0	69·0	161·75
Rubber—Lewis	—	—	—	—
Dudley	138·8	65·2	40·5	1244·5
				701·0
HARROW.				
Glider— Weight	5·5	30·1	32·75	68·25
Shepherd	143·0	46·2	10·0	199·2
Rubber—Peterson	63·5	61·4	84·6	209·5
Gow	380·3	—	—	380·3
				857·25

The Second Round for the London League is as follows :—

HARROW *v.* BUSHY PARK.
PHAROS *v.* NORTHERN HEIGHTS.
WALTHAMSTOW—Bye.

The London Area Council Dinner & Dance will be held at the Lisbeth Hall, Soho, on Sat. Nov. 18th. The London League prizes will be presented on this occasion.

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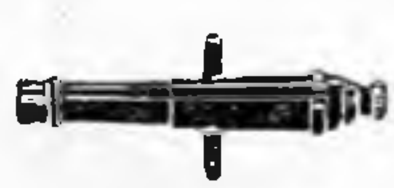

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