·SUMMER·NUMBER·

AERO MODELLER

VOL.5. No. 56.
JULY - 1940.
8d

SPECIAL FEATURE

FULL SIZE PLANS OF A FLYING SCALE MODEL OF A **HENSCHEL**

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THE AERO-MODELLER

ALLEN HOUSE

NEWARKE STREET, LEICESTER, ENGLAND

Managing Editor : D. A. Russell, *A.M.I.Mech.E.*

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Draughtsman : C. A. H Pollitt

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VOL. V, NO. 56 JULY, 1940

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Members of No. 88 (St. Pancras) Squadron with some of their models.

The AERO MODELLER
INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

JULY - - 1940
Vol. V. - No. 56

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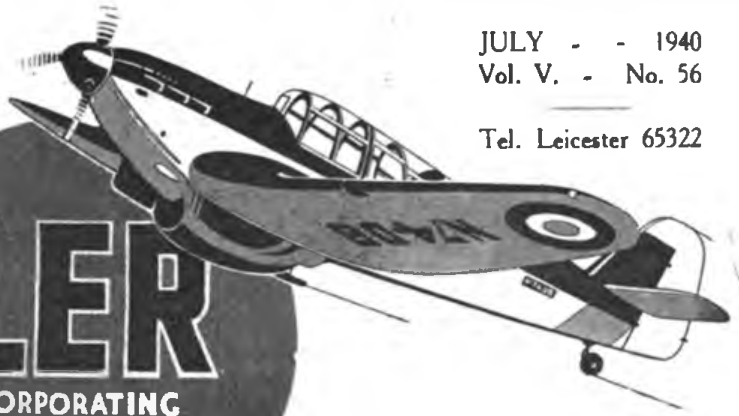
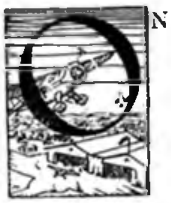


Editorial



ON page 451 of this issue, we print a comprehensive list of plans of model aircraft which are now available from the offices of THE AERO-MODELLER. During the greater part of last year we were able to give away free with every other issue a large insert plan. This is no longer possible under war conditions. Apart from this, however, there has always been the point that no matter what plan we put out with each issue of THE AERO-MODELLER, it could not appeal to more than a certain percentage of our readers. Really this limited us to popular plans which could be expected to have a reasonably large appeal. To have put out plans of, say, a large petrol 'plane, or a large glider or a tail-less pusher would have meant that the vast majority of the plans would not have been used. This new list of plans should now meet the position well, since each reader can make his own choice. As readers will see, there is quite a large selection, and we have kept the prices as low as is possible. Copies of any of the plans advertised are now available, and in all cases can be obtained from the offices of THE AERO-MODELLER, post free, at the price stated. Plans may also be obtained from any model shop.

It will be noted that there are several of the lesser known types of 'planes included in the list. These we know will appeal to those enthusiasts who delight in building something-out-of-the-ordinary. It should also be noted that in this list of plans is included Copland's 'Plane, "The Air Cadet," and the winner of the Gamage Cup, designed by the Chairman of the Council of the S.M.A.E., Mr. A. F. Houlberg.

A Letter from the Royal Aeronautical Society.

Herewith we publish a letter from J. L. Pritchard, Esq., Secretary of the Royal Aeronautical Society, which was recently addressed to Mr. E. F. H. Cosh, Hon. Secretary of the S.M.A.E.

It is very gratifying to note that in these troublesome times both the Aeronautical Society and the Royal Aero Club can find time to encourage aero-modellers throughout the country in carrying on the building and flying of model aircraft.

Truly is it said that "Model flying is a very necessary link in the chain of interest which must be forged." From the young boys flying their first models on the green fields of this country, some of them as young as 7 or 8, to the old (but yet still young) men attending meetings and organising classes; there arises a strong force determined to keep aviation to the fore in the national interest. And long may it remain so.

The Royal Aeronautical Society.
4, HAMILTON PLACE,
PICCADILLY, LONDON, W.1.
29th April, 1940.

DEAR MR. COSH,

Thank you very much for letting us have copies of the first four issues of the S.M.A.E. Journal. I am so glad to see that you are making every effort to carry on, as I am sure that every side of aviation should be pushed to the limit, so that everyone in the long run will take a lively interest in such a vital subject to our safety. Model flying is a very necessary link in the chain of interest which must be forged.

Yours sincerely,
(*Signed*)
J. LAURANCE PRITCHARD,
Secretary.

E. F. H. COSH, Esq.,
Society of Model Aeronautical Engineers.

The Air Cadet.

On page 447 we publish the full list of rules for the Air Cadet competition, to be held on August 11th next. This is a decentralised competition which has the blessing of the S.M.A.E., and it is hoped that wherever possible timing of the entrants' flights will be carried out by S.M.A.E. timekeepers. Where this is not possible, timing will, of course, be accepted from Squadrons, but it should be noted that all flying is to be under S.M.A.E. rules.

Mr. C. A. Rippon, designer of this 'plane, has suggested that there should be a "Construction and Finish" competition, and this will be held on September 15th at the Headquarters of the Air Defence Cadet Corp., to which address models must be sent by September 15th.

Copland's 'Plane.

We would also remind readers of our "Copland's Wakefield Model" competition, for which we are giving valuable cash prizes. This competition closes on August 31st. The rules were published on page 302 of the May issue of THE AERO-MODELLER and a copy of these, together with the official entry form (which must be used) may be obtained from the offices of THE AERO-MODELLER on receipt of a stamped addressed envelope.

Airfoil Sections.

On pages 424 to 426 we publish an article by Messrs. Powdrill & MacBean, who

The "Boulton Paul Overstrand," built by Mr. W. R. Jones, of 18 Belvoir Road, Princes Park, Liverpool 8, who wins our 10s. 6d. prize for the most detailed model, as requested in the May issue of THE AERO-MODELLER.
285 hours were spent on the construction of this model, which is of 34 in. wing span.
Cockpit fitted with all controls, including instruments covered with glass.
Moveable control surfaces worked from cockpit.
Sliding roof to cockpit.
Rear guns moveable on scarff rings.
Gun turret complete with seats, gun and ammunition drums.
Spring undercart and tail-wheel.
54 parts to each engine.
72 lengths of bracing wire.
Message carrying tube. Navigation lights.
Wireless aerial, complete with insulators.
And it glides in spite of everything!
(Many readers misunderstood the purpose of this competition and forwarded details of machines cut from other periodicals. Naturally we meant the prize to go to the reader who had actually built a fully detailed machine—after all, he did the work!)

have been specially commissioned to carry out research work on behalf of THE AERO-MODELLER. In this, their second article, they publish results of a series of investigations carried out in a wind-tunnel on sections commonly used by aero-modellers. Tests were also carried out on fuselage models, and the results make very interesting reading.

Many and many a time have we received requests from readers for particulars of how to draw out airfoil sections. Now the answer has been provided by Mr. J. W. B. Cruickshanks, who has written a book entitled "Airfoil Sections for the Aero-Modeller." Mr. Cruickshanks is well known as a contributor to our pages during the last year with several valuable articles on Airfoils. His book contains particulars of thirty-six airfoil sections, each one drawn out to a 7 in. chord. All these drawings are on "squared" paper, and instructions are given which will enable aero-modellers to enlarge or reduce to any desired chord. The book is published by the Harborough Publishing Company Ltd., at the popular price of 1s. 6d., and full particulars are given on page 427.

The National Guild of Aero-Modellists.

Enclosed with each copy of this issue of THE AERO-MODELLER is a four-page leaflet giving full particulars of the N.G.A., and the lapel badge and transfers which are obtainable. The fourth page of the leaflet comprises a membership form, which should be detached and filled in by all aero-modellists who have not yet effected a third party insurance.

For the benefit of recent new readers we would explain that the N.G.A. was originated at the beginning of last year by Messrs. Dudley Ship and D. A. Russell, and has Lt.-Col. C. E. Bowden as Honorary President. Many thousands of our readers have since become members, and several benefited last year from the insurance effected.

We are pleased to note that a number of clubs, the Igranic, of Bedford, is one of them, have made it a rule that all their members must belong to the N.G.A. We shall be glad to hear of other clubs which have also made this rule.

As is well known, the S.M.A.E. requires all its petrol 'plane members to effect third party insurance, and the N.G.A. policy is accepted by the Society. We cannot too often emphasise the vital importance of all aero-modellists being covered against possible third party claims which may arise whilst they are flying model aircraft. The N.G.A. last year settled a claim for as much as £30 in respect of an eye injury caused by a rubber-driven 'plane flying in Hyde Park.

From our American friend, Ted Alexander, we have just

Winner of our special competition for the best looking model of the Handley-Page "Hampden," built from plans given in the March AERO-MODELLER. *Fine detail work (note the celluloid cabin, etc.), and good photography brings Donald C. Beattie, of 42 Greycote, Shortstown, Bedford, the 10s. 6d. prize which he has well earned.*

received news that an insurance scheme is now available from the Academy of Model Aeronautics, which is the governing body for all model aviation activities in America. The American scheme is somewhat different to that of the N.G.A. in that claims up to 25 dollars will be sustained on account of the model *itself*, but we note that third party claims are *limited* to 500 dollars. This is about £100.

The question of aero-modellists insuring their 'planes is one which has received careful consideration, but in our opinion the policy of the N.G.A. to provide the greatest possible cover in regard to third party claims is the right one, and it should be noted that, so far as the English insurance is concerned, ***the policy is underwritten by Lloyds, and that an unlimited number of claims each up to the value of £5,000 will be entertained.***

Now, many readers have before complained when we printed a membership form on one of our pages, that their copy of THE AERO-MODELLER had to be mutilated to detach it. We have therefore met their wishes in this issue by inserting the leaflet *loose*, and we trust that readers will now respond, and that we shall be flooded out with membership forms!

Readers should note that whilst applying for membership they can order whatever transfers they require, and their lapel badge at the same time, thus saving postage.

D. A. R.

"C.J.B."—An Appreciation

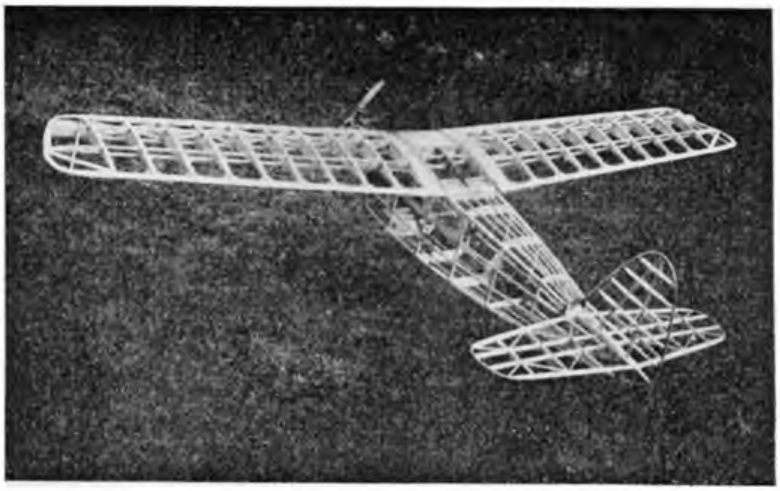
"C.J.B." or to give him his full name, Mr. C. J. Burchell, Fellow of the Society of Model Aeronautical Engineers, is one of the real pioneers of the model aeroplane movement, having been designing and building for about 35 years.

I first made his acquaintance in 1919, when on resuming civil life, I wrote to *Flight* with the idea of making contact with some of the pre-war enthusiasts. Curiously enough, Mr. Burchell was the only person who troubled to answer, and on meeting him I was introduced to a number of enthusiasts whom he had encouraged and kept together during the war. I was struck by his own enthusiasm, and found his ideas and work of the very highest quality.

Charlie never hurried a job. He always set a fine example and did it properly, and those hundreds of people who have had the advantage of his help will all testify to his painstaking methods.

For him there was only one matter of importance, and that was the success and future of the movement, and it is so to-day. He has been closely associated with the foundation of many clubs in and around London, my own, the Northern Heights, included, and he has always been a keen critic of the activities and policy of the S.M.A.E., and although he has not always agreed with its actions, he has always been activated by the highest principles.

This photo was taken a good many years ago, and shows Mr. Burchell holding one of his gliders, which at the time held the record with 60 seconds.



AN 8 ft. SPAN PETROL

Designed and Constructed by

In this photograph may be seen a general view of the 'plane. Note the rounded top to the fuselage.

DURING the past few years the petrol 'planes I have built have fallen into two distinct classes; firstly, there have been the purely experimental models; and secondly, what I call the utilitarian or " fly-under-any-conditions " models. An example of the first type was the 10 ft. span low-wing monoplane that I built some four years ago, and which has now passed into honourable retirement, and which has been followed by my one-fifth full-size flying scale model of the " Westland Lysander." As this model appears to have created quite an amount of interest, I am giving the latest position regarding it.

Up to the outbreak of war last September I had got the machine completed except for the main wings and engine mounting. This latter has since been built, but this is all I have been able to do during the winter months, with so much other work on my hands. However, recently I have been able to get back to my workshop, and the wings are now under way, and I hope before this summer is out to have had the model out for testing. Full details as to results will be published in this journal as soon as available.

And now for the second type of model.

Here is a description of the 8 ft. span high-wing 'plane I was flying during 1939. There is nothing spectacular about the design, and the model has not got that terrific " super climb " performance of American machines, which is (quite easily) obtained by grossly over-powering the model or under-loading the motor—have it whichever way you like—but which does not appeal to me! The 'plane has a wing area of something over 8 sq. ft., and weighs 8¼ lb. " all-up." It is powered by a 10 cc. engine, which will lift it off the ground after a short run and gives it quite a good performance, except on the very windiest of days. Those readers who have followed the views I have from time to time expressed in THE AERO-MODELLER will know that I have attempted to design my models to a definite specification, build them, and then, as the saying is, " fly them straight off the drawing-board." The design of this model is quite straightforward, and incorporates several features of which I am particularly fond, of which I have now had several years' experience, and which as yet I have been unable to better. One of these is the method of wing attachment. I still cling to my curtain rod fixings! Originally I used to fix the wings direct into the sides of the fuselage. This was all right, except that the incidence of the wings could not be too easily varied. On this machine I got over the snag by building a centre-section the width of the fuselage, to which the wings were connected by the birch dowel rods. This centre-section can be clearly seen in one of the photos, in which may also be seen the two rods extending as far as the third rib of the half wing.

The clean lines and average width of the wheel track may be seen in this photo. Above is the author, at extreme right, standing behind the 'plane, at the South Coast Gala Day Meeting in August, 1939.

HIGH-WING 'PLANE

D. A. RUSSELL, A.M.I.Mech.E.

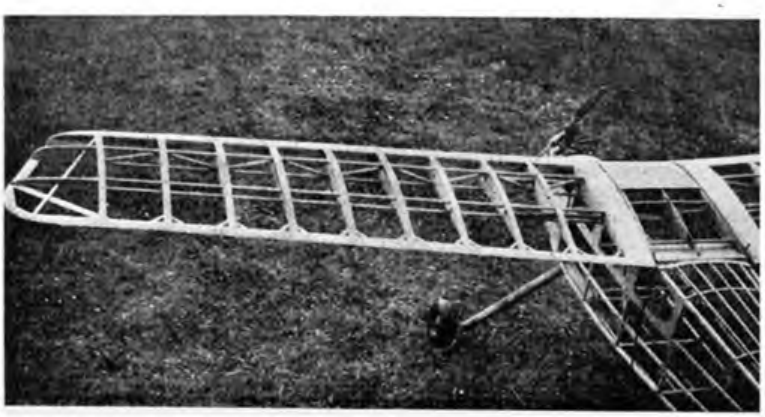
Here is the author carrying the 'plane at Fairey's. Mrs. Russell follows up with the invaluable box of spare parts, petrol and oil supplies, etc.

These rods pass inwards as far as the centre rib of the centre-section, which is made of $\frac{1}{8}$ in. three-ply. This forms a firm anchorage for the rods. The centre-section is held down to the top of the fuselage by rubber bands. The wings are fixed only to the centre-section; thus, if the machine flies into a tree and one wing hits a branch, the two dowel rods will snap and allow the wing to fall off. The efficacy of this arrangement is proved by the fact that on one occasion this 'plane flew into a goal-post, striking same in just about the middle of one of the wings. The two $\frac{3}{16}$ in. dia. dowel rods snapped off quite clean and the wing was barely damaged. The 'plane would be flying at about 18 to 20 miles an hour.

Perhaps some readers will doubt the rods will break in this way? If so, they should get someone to show them the trick of a pencil being broken in half by a folded pound note. One person will hold a pencil horizontally in his two hands, grasping it firmly at either end. The " performer," having made a show of " mumbo jumbo," folds up a one pound note like a paper spill, and with a swift blow cuts the pencil clean in half. The secret of the trick is that as the " performer's " hand is sweeping down towards the pencil the thumb is moved forward and the side of it, backed by the thumb-nail, hits the pencil, *which, due to its inertia and the swiftness of the blow*, is cleanly fractured.

Another development incorporated in this 'plane is the landing gear. This is an improvement of the type I was using in 1938, where the two cantilever legs were crossed. This had one disadvantage, in that whilst the rear leg could move backwards by itself, the front leg, obviously, since it passed in front of the rear leg, pushed that back when it moved. In the present 'plane I got over this difficulty by mounting the two legs at a common point in the centre of the fuselage. One of the photographs shows a view looking down into the fuselage, and in it may clearly be seen the $\frac{1}{4}$ in. steel bolt which passes through the two legs, forming a pivot. In another photograph may be seen the left-hand leg projecting through a slot formed at the bottom corner of the fuselage. There is also a diagrammatic sketch especially prepared by Mr. C. A. H. Pollitt, in which the whole arrangement can be clearly seen. It will be noted that the landing stresses are carried through the framework, built from $\frac{1}{16}$ in. three-ply, to several parts of the fuselage; in fact, from the nose to half-way down towards the tail. Suspension is by means of rubber bands, which run from hooks fixed to the front of the legs up to a birch dowel which passes through the nose of the 'plane.

The advantages of this arrangement are several.



On right is a good photo showing the wing construction. Also may be seen the centre wing section, which fits on the top of the fuselage, and into which each of the half wings is connected by wood dowel rods. Above may be seen the model in flight, during a rainstorm, at the 1939 Northern Rally.

This photo was taken looking down into the fuselage. The bolt holding the chassis legs may be seen, and to the right the platform for the battery.

The construction of the fuselage is quite straightforward, the four main longerons being of $\frac{3}{16}$ in. square birch. The built-up formers are also of $\frac{3}{16}$ in. birch, but the verticals are joined by semi-circular bulkheads of $\frac{3}{16}$ in. balsa, on the outside of which are laid up the stringers forming the turtle-shaped top to the fuselage and a slightly concave shape for the underside.

The construction of the wings is also quite straightforward, and is clearly shown in the photographs. The ribs are of $\frac{1}{8}$ in. thick balsa, and are spaced 4 in. apart, with their top and bottom edges protected by $\frac{1}{2}$ in. wide by $\frac{1}{32}$ in. thick strips of balsa. Over this the silk covering is laid, and because of the strips there is no chance of the silk tearing on the edges of the ribs. The wing section is R.A.F.32.

This photo shows one of the steel tube chassis legs projecting through the slot constructed in the bottom side of the fuselage.

(*Below*)

The time switch is located on a panel of three-ply fixed to the bottom longeron and the one above. In front of the switch is the connection for plugging in the "booster" accumulator.

Firstly, each leg is entirely independently sprung and has the proper backward movement which is necessary on a petrol 'plane. Secondly, the degree of tension of the rubber suspension may be varied. Thirdly, the stroke of the leg may be controlled by the addition or removal of packing pieces at the rear end of the slot in which the leg moves. The whole arrangement is extremely robust, quite simple to make, and has never given any trouble. To see the 'plane come down and one wheel touch just before the other, and just the one leg move backwards, followed by the other one as the tail drops to complete the landing, is a very good sight.

The suspension of the rear wheel is carried out on similar lines, and is clearly seen in one of the photographs. Here again the tension can naturally be varied to suit different conditions.

The tail-plane is built as a single unit, and is locked into position by the anchorage of the fin. The profile of the latter is formed from $\frac{3}{16}$ in. dia. cane, and the vertical post is $\frac{3}{16}$ in. square birch. This passes right down to the bottom of the fin and locates in a small steel plate fixed to the end of the fuselage. The forward end of the fin is held down by a loop of rubber, which passes over a peg at the front of the fin and is looped round the birch dowel, which passes through the fuselage and forms the anchorage for the rubber bands which act as the shock absorber for the tail-wheel. A small adjustment is provided for the tail unit to be adjusted for incidence, and

From this photo, and the one at bottom left of the opposite page, may be gathered the general lines of the 'plane. The N.G.A. badge and S.M.A.E. registration numbers may be noted.

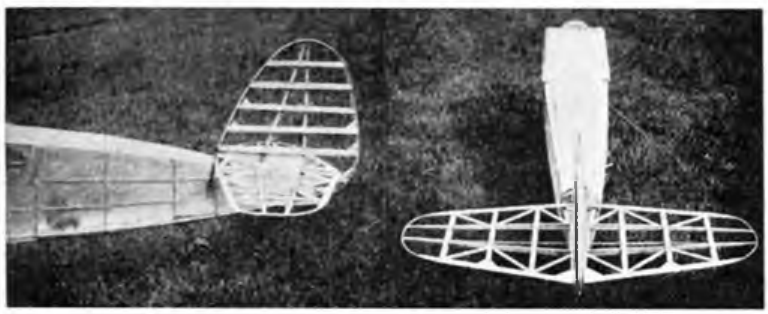
normally the 'plane is flown with it at a slightly lifting setting.

The method of mounting the engine will, I think, prove of interest. The 9 cc. Dennymite engine is supplied mounted on two aluminium brackets, to the underside of which the coil and condenser are fixed. As the petrol tank is mounted between the brackets behind the crankcase of the engine, everything is to hand in a compact manner. The unit, exactly as supplied by the makers, was simply mounted on a three-ply bulkhead $\frac{1}{8}$ in. thick, which was arranged to slide vertically into the nose of the 'plane in grooves constructed at either side. The bulkhead is held in position by two small wood screws. The nose of the 'plane is panelled from the landing gear anchorage forward, with two thicknesses of $\frac{1}{32}$ in. thick three-ply. The bottom front part of the nose is reinforced with a good stout block of balsa. The whole arrangement is extremely robust yet quite light.

In one of the accompanying photographs are three views of the front of the fuselage somewhat staved in and the engine knocked forward. I took these three photographs on Fairey's Aerodrome, and they show the front of the 'plane exactly as it landed following a power dive of close on 100 ft.! The day was very windy, and in an earlier flight one of the wing dowel rods had broken and I had not noticed this. I put the 'plane up again, and it was climbing well when the wings started to fold up like a butterfly; down dropped the nose, with the engine still running, and the 'plane eventually arrived back on terra firma!

The three photographs have not been retouched in any way. It will be seen that one blade of the airscrew has been damaged and that the aluminium engine brackets were distorted and the engine tipped forward. It was entirely undamaged. I dismantled it off the aluminium brackets—" bent them straight "—and re-mounted the engine with a fresh airscrew, and that was that. As for the nose of the 'plane, I pushed everything back into place, jammed it in position with pieces of wood, poured the best part of a tube of good glue into the space between the two thicknesses of $\frac{1}{32}$ in. three-ply, laid up a new piece of silk round the outside to cover the cracks, and allowed to dry, and *that* was also *that!* (As I said at the beginning of this article, my 'planes are either experimental or utilitarian. I have not time to go in for elaborate and lengthy repairs. I have seen a number of 'planes crash from a far less height than this one crashed and the engine has been wrecked and rammed pretty well into the tail end of the model!) The whole operation of replacing the engine and repairing the fuselage of this 'plane took me just under two hours.

On left may be seen the rubber band suspension for the rear wheel, and on right views of the fin and stabiliser.

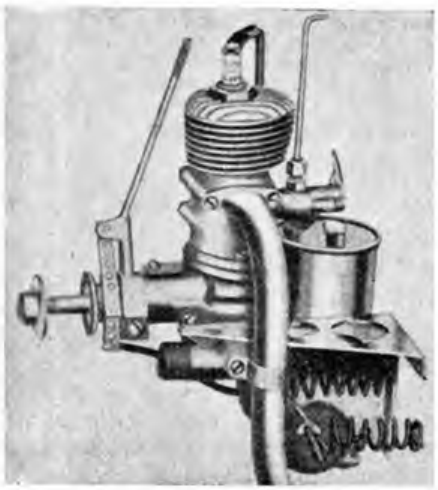


Perhaps I might say a word about the photographs which illustrate this article. I am indebted to friends who took the one of the 'plane flying, of the group at the South-East Coast gala day, and the one of myself carrying the 'plane on Fairey's Aerodrome. I also have to acknowledge the kindness of Cloud Model Aircraft, who loaned me the block of the Dennymite engine.

All the photographs of the 'plane itself I took with a $3\frac{1}{4}$ in. $\times 2\frac{1}{4}$ in. Kodak camera of quite normal value, the close-up views being obtained with the addition of a 3s. 6d. portrait attachment. I make no claims to being a photographer of any particular class, but recently there have appeared articles in the pages of THE AERO-MODELLER regarding photographing of models, and I put these forward as an example of what a man of quite ordinary skill can take, *provided* care and attention is given to the background. The majority of photographs of models are spoilt by the background bearing no relation to the model or being out of proportion. In other cases, not enough attention is paid to getting a symmetrical photograph. Personally, I think the time and trouble spent placing a model exactly so, or using a ruler to measure the distance between the lens (when fitted with a portrait attachment) and the part to be photographed, is time well spent.

And now as to the flying capabilities of this 'plane. Firstly, I should say that no attempt was made to cut down weight; many of the parts are braced with fillets, and glue has been liberally used at all joints. I could build this 'plane again, and if competing in a weight competition, could easily save $1\frac{1}{2}$ lb.; so that anybody

who wanted to get a snappy performance could do so by building down to a weight of 6½ lb. As for the engine, this should not be of less than 9 cc., and I make no recommendation as to the make which may be used. I think there is hardly a petrol engine which I have not at some time or other used in my models, and the fact that this 'plane was originally powered with a " Dennymite " does not mean that equally good results could not be obtained from, say, a Brown " Junior " or other engine of similar size.



The 9 cc. " Dennymite " De Luxe engine unit used by the author. There are, of course, several other makers of engines of a size suitable for the 'plane described in this article.

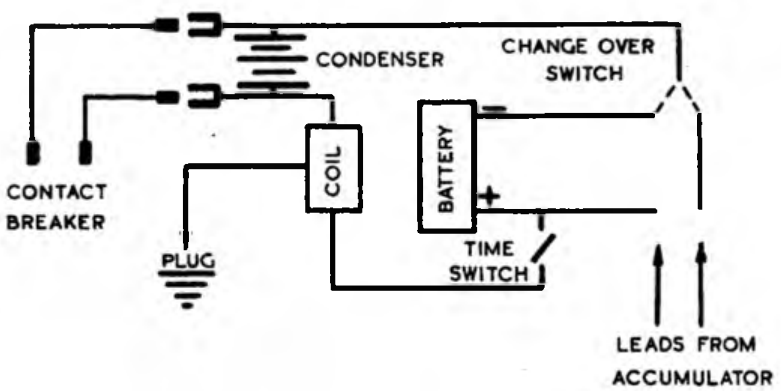
Above is shown the stout yet cleanly designed nose of the 'plane. On right are two views of the engine — that on the right shows how most of it is enclosed.

The photograph of the 'plane in flight was taken at the Northern Rally in 1939, which, as most readers know, was literally a " wash-out," since it rained steadily most of the afternoon in a typical Manchester fashion! I had just got the 'plane into the enclosure for judging when the rain came down in torrents. There was *only* time to put a rag over the engine, and there the 'plane stayed in solitary state throughout the storm! Later in the evening the weather cleared somewhat, but it was still drizzling.

In another photograph the 'plane is shown lined up at a South Coast gala day meeting, held in August, 1939. On that occasion the 'plane was flying very well. There was a good wind and the day was hot and sunny. On my first flight I was over-careful with the setting of the time switch, and only clocked 24½ seconds engine run out of the 30 seconds allowed. Nevertheless the total length of flight was 73 seconds odd, which I think compares quite favourably with the time of 83 seconds obtained by Mr. Coxall with his well-known high-wing " Bowden " Cup winner. He was more skilful than I, and clocked an engine run of just under the 30 seconds.

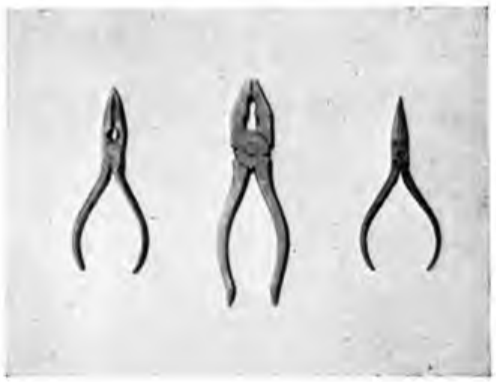
Three entirely untouched photos, showing the exact amount of " damage " sustained by the 100 ft. dive on to Fairey's Aerodrome, which is described in the article.

PLUG & SOCKET CONNECTIONS BETWEEN ENGINE AND PANEL

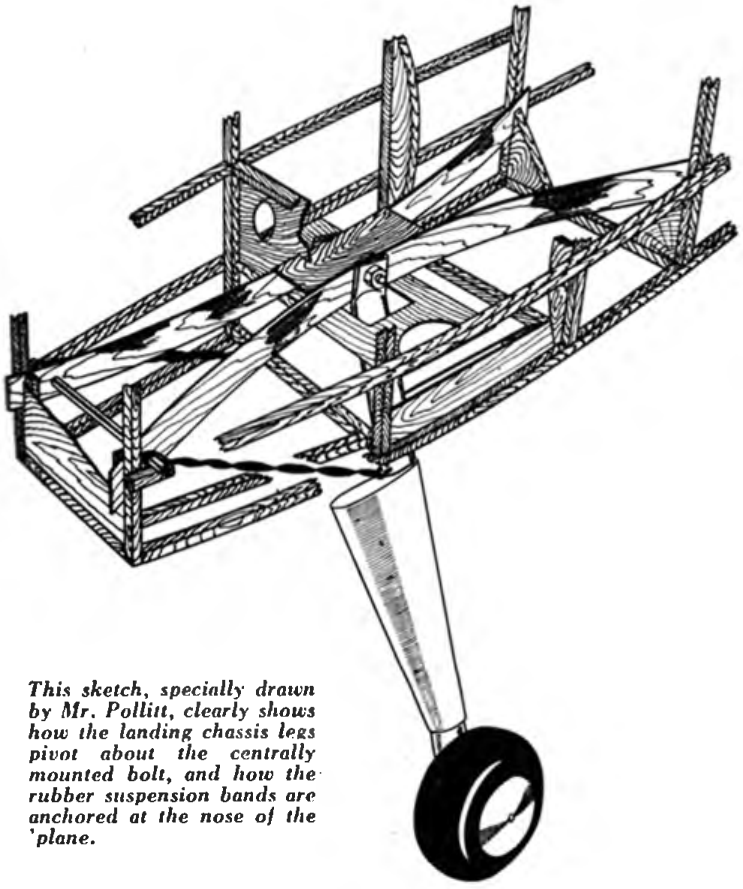


The glide of the model is good, and as it has no real vices, I have tried out a rather unusual combination of wing and fin setting to counteract torque. The engine is very powerful, and if the torque had

been entirely counteracted by offsetting the engine to one side, it would have meant a displacement of several degrees. I therefore set the left wing (when looking forward along the fuselage and standing at the rear of the 'plane) with slightly more incidence than the right wing. The fin was also set with a slight bias, to turn the 'plane in right-hand circles. This appeared to be quite effective and had no detriment to the glide, for as soon as the engine "cut" the 'plane would carry on in the same direction in which it had been flying. By marking the



Three pairs of pliers specially adapted for model construction where very small nails are used.

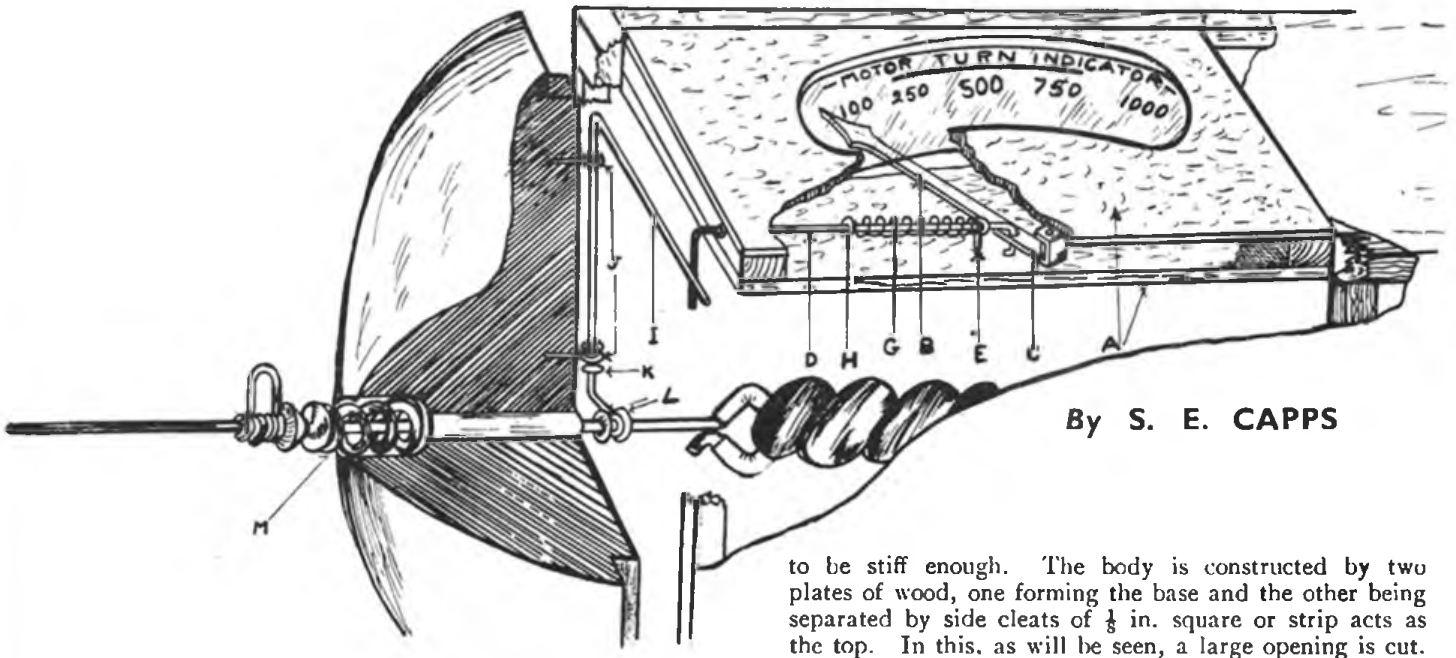


This sketch, specially drawn by Mr. Pollitt, clearly shows how the landing chassis legs pivot about the centrally mounted bolt, and how the rubber suspension bands are anchored at the nose of the 'plane.

setting of the fin position and calling it "neutral," the fin could then be moved to one side or the other, and thus cause the machine to fly in left- or right-hand circles. I found also that when taking-off into a wind of any strength it was wise to point the 'plane just a few degrees to the right of the line of direction of the wind. This meant that if the wind was going to get under a wing, it would get under the left-hand wing, and so help it against the torque of the engine.

Perhaps a few words about my 1940 machine may be of interest. The design followed is very similar to this 'plane, and I am using the wings off the old 10 ft. span low-wing monoplane mentioned at the beginning of this article! Yes, despite all the bumps and batterings, the wings are still in 90 per cent good condition. I have re-covered the tops of the upper surfaces and cut 6 in. off their length. A new centre-section has been built, and the overall span will come out at something over 9 ft. The fuselage and landing gear are similar to the 8 ft. span 'plane, but the engine is going to be my faithful old 18 cc. Comet. I plan that the all-up weight of the 'plane will not exceed 10 lb., so I hope that *this* 'plane will hold its own in anything but a gale! It should be flying within the next couple of months, and I hope to publish particulars, with photographs, in a later issue.

A BUILT-IN DIRECT READING MOTOR TURN INDICATOR



By S. E. CAPPS

THE indicator shown here was built after many rubber motors and machines had come to an early end because of the motors breaking through over-winding. The writer has always found it very difficult to count the turns on any rubber motor while winding the airscrew and conversing at the same time, and anything that would help to ensure the motor not being overwound, at the same time removing the necessity of counting, is to be welcomed. The gadget described here has given least trouble of the many such tried by the writer. The advantage of being able to read on a dial the approximate number of turns on the motor while winding is to be preferred to counting at any time.

The sketch may appear to be somewhat complicated, but actually there are only a few working parts in this gadget. The bodywork being wood and the metalwork bent wire engineering, the construction should present no difficulty to the average modeller. All wood and metal together with any tools required that the modeller has not got can be obtained from the local model stores, who should be approached in all cases of difficulty with model matters. Remember that where you handle one or two models they handle probably hundreds of all types, as well as most gadgets and fittings that are part of the modeller's equipment. It therefore means that many little things become known to them which they are only too willing to hand on to you in an endeavour to help you, should you at any time require it.

The Indicator Panel.

This is shown in the sketch at A, and can be made from hard balsa wood. The thickness should be such as to be rigid enough for the size proposed, but it is doubtful if less than $\frac{1}{16}$ in. sheet could be relied upon to be stiff enough. The body is constructed by two plates of wood, one forming the base and the other being separated by side cleats of $\frac{1}{8}$ in. square or strip acts as the top. In this, as will be seen, a large opening is cut. This serves as the window of the gadget, through which the pointer B can be seen at work.

The cleats are cemented to the baseplate and left to dry, after which the mechanism is attached and the top plate fitted and finally cemented in place. It should be understood that as many of the modern designs of models show the front part of the sides and top of the fuselage filled in with sheet, the top filling can be used as the top plate of this gadget, the whole being made as a unit and fitted in place afterwards.

The Indicating Mechanism.

This, as stated before, is mostly wirework, with the exception of the pointer B, which is cut from a thin piece of aluminium or thin brass about 1 mm. thick, the lower end being formed to the shape shown and secured to the base by the pin C. This is made from an ordinary dressmaker's pin, the headed portion being retained after being cut off to the required length. A small hole is drilled a short distance up the pointer to take the end of rod D.

D is arranged to move freely in eye E, which, together with the pivot pin of pointer B, is cemented into the baseplate. A hole is drilled in the forward cleat to take rod D, in which it should slide easily. Rod D is prevented from disconnecting from pointer B by the end being bent as shown. The forward end is also bent round at a right-angle to take the pressure from lever I. Rod D and pointer B are returned to zero position by spring G, which is held in tension by washer H, which is soldered to rod D. When completely assembled, the operating rod D should, on having pressure applied to the forward end, force pointer B from the forward position to the rear, and on being released should fly back

(*Concluded on page* 427).

DO NOT CONCENTRATE ON WAR

Do not concentrate your thoughts upon war subjects. You will find it very worrying and very bad for the nerves.

Read, write, sketch, paint, study your vocation ; anything that will occupy your mind and your time. Make use of your spare time by concentrating upon something useful.

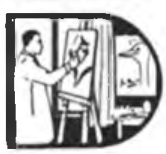
During the last war many people learned how to write short stories, etc. To-day a number of them are world-famed authors.

By becoming efficient in your vocation you can give the best service to your country and to yourself. The more you increase your earning power the better it is for the country and for yourself personally.

War or no war, earning power always brings its possessor to the front. It is no use waiting for better times. The ideal opportunity never arrives. We have to make the best of existing conditions. Therefore, delay is useless ; it is worse, it is harmful.

DO ANY OF THESE SUBJECTS INTEREST YOU?





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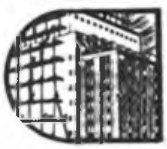

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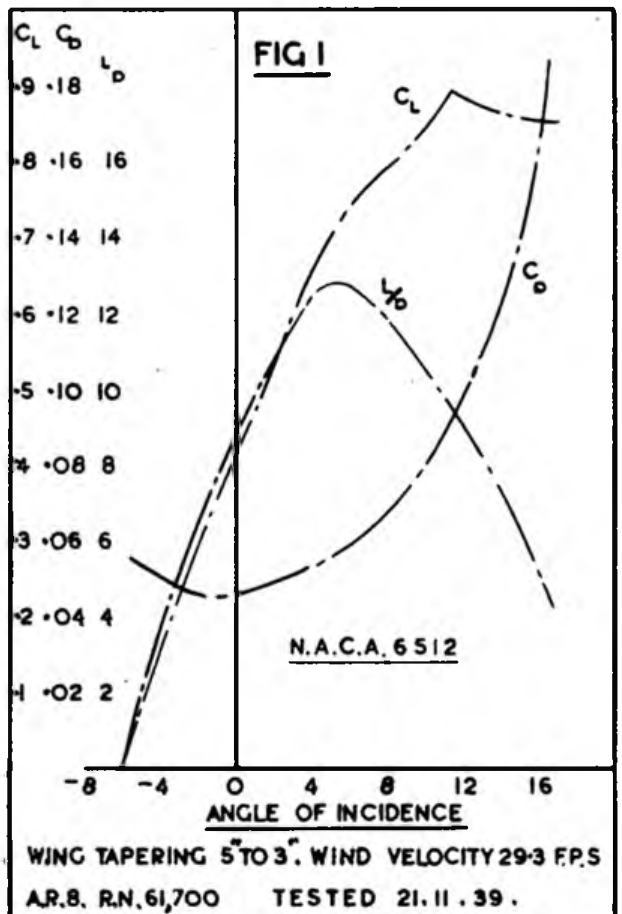
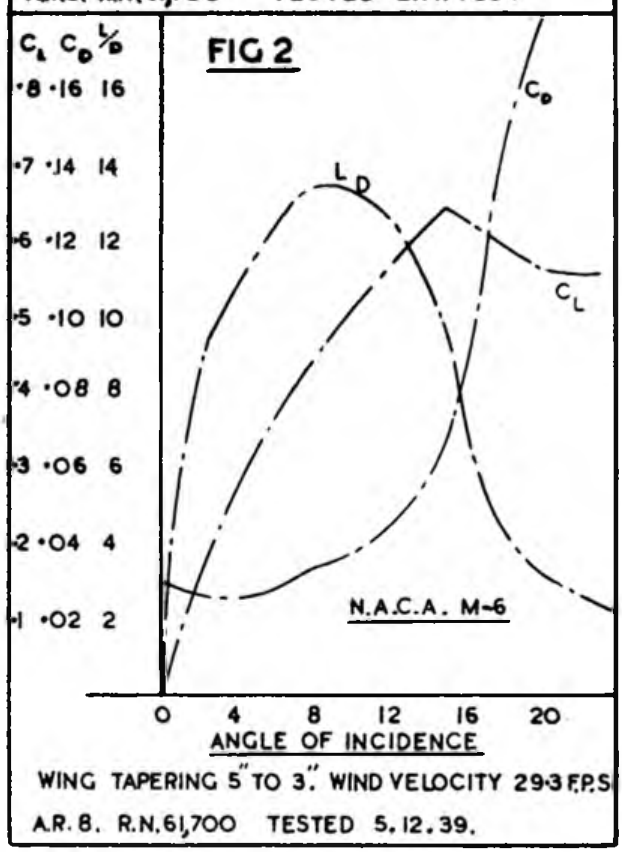




WIND-TUNNEL TESTS

By E. J. POWDRILL and A. H. MacBEAN

(By kind permission of Dr. R. H. J. Brown)

CONTINUING our tests on model airfoils, we give here the results of tests on two more airfoil-sections. These are Clark Y and Grant X 8. Having seen in the field that models whose wings are not very well covered appear to perform quite well, we determined to find out whether badly covered wings, with loose, wrinkly tissue, are actually inferior in characteristics to those in which the tissue is smooth and tight. The section chosen for these experiments was Clark Y. The wing framework was covered with tissue in the normal way, was not water-sprayed or doped, but was tested with the tissue loose and wrinkled. After the tests, the wing was water-sprayed and doped, and then the tests were repeated. The wing shape was the same as that used for N.A.C.A. 6512 (see AERO-MODELLER for March, 1940). The data for plotting Clark Y can be obtained from the AERO-MODELLER of March, 1939 :—

The results were :—

CLARK Y.

Angle of incidence.	Slack covering.			Tight covering.		
	C_L.	C_D.	$L/_D$.	C_L.	C_D.	$L/_D$.
−5°	0	·0553	0	0	·0406	0
−2·5°	·1950	·0479	6·15	·295	·0369	8·00
−0°	·4125	·0405	10·18	·4915	·0406	12·10
+2·5°	·5900	·0517	11·42	·6095	·0479	12·70
5·0°	·7080	·0642	11·05	·688	·0555	12·40
7·5°	·7860	·0745	10·55	·806	·0715	11·25
10·0	·7860	·0944	8·33	·806	·0995	8·10
12·5°	·7860	·1211	6·46	·885	·1290	6·86
15·0°	·7860	·1481	5·28	·835	·2010	4·15
17·5°	·6385	·2400	3·26	·786	·2365	3·33

These results are better compared by means of graphs constructed from them. (See Fig. 4). (Graphs constructed from the results of tests on N.A.C.A. 6512, N.A.C.A. M.6, R.A.F. 32, published in THE AERO-MODELLER, March, 1940, are also included—Figs. 1, 2, 3, respectively). From the graphs for Clark Y, we see that it definitely pays to take care in covering our models, making sure that the tissue is smooth and tight. The wings, with good covering, have a higher maximum value of C_l, a lower minimum value of C_d, and a higher maximum $L/_d$.

The other airfoil-section dealt with for this article, Grant X 8, was chosen because it was designed by one of America's leading writers on the theory of model aircraft, C. H. Grant. It is claimed that this airfoil has extremely good characteristics, with a high maximum C_l, and a very high $L/_d$. Having never seen any published performance figures for this airfoil, we thought it would be of interest to produce some, and to see how far the claims are upheld by actual experiment.

As no data for drawing Grant X 8 have yet appeared in THE AERO-MODELLER, we give a table from which the section can be constructed :—

ON MODEL AIRFOILS—II

Next month our contributors, who are conducting a series of experiments especially for THE AERO-MODELLER, *will give the results of a number of researches made with different types and brands of rubber motors.*

GRANT X 8.

Station (% of chord).	Upper surface.	Lower surface.
0	0	0
1·25	2·40	−1·20
2·50	3·73	−1·67
5·0	5·40	−2·33
7·5	6·73	−2·67
10·0	7·73	−2·73
15·0	9·07	−2·53
20·0	9·80	−1·93
25·0	10·27	−1·33
30·0	10·53	− ·87
35	10·53	− ·67
40	10·33	− ·53
50	9·53	− ·60
60	8·27	− ·80
70	6·60	− ·93
80	4·67	− ·73
90	2·47	− ·40
100	·05	− ·05

The results (see Fig. 5) were as follows :—

GRANT X 8. (Wing shape as above)

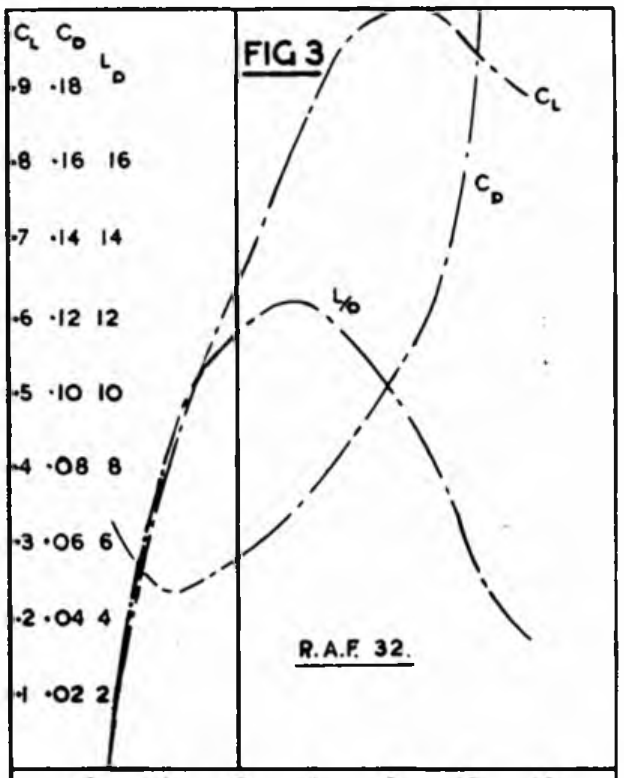
Angle of incidence.	C_L.	C_D.	L/D.
−2·0°	0	·0442	0
+0·5°	·295	·0368	8·00
3·0°	·393	·0368	10·68
5·5°	·540	·0442	12·22
8·0°	·688	·0590	11·66
10·5°	·785	·0736	10·68
13·0°	·884	·0921	9·60
15·5°	·884	·1070	8·27
18·0°	·884	·1660	5·32
20·5°	·884	·2000	4·40
23·0°	·835	·2580	3·23

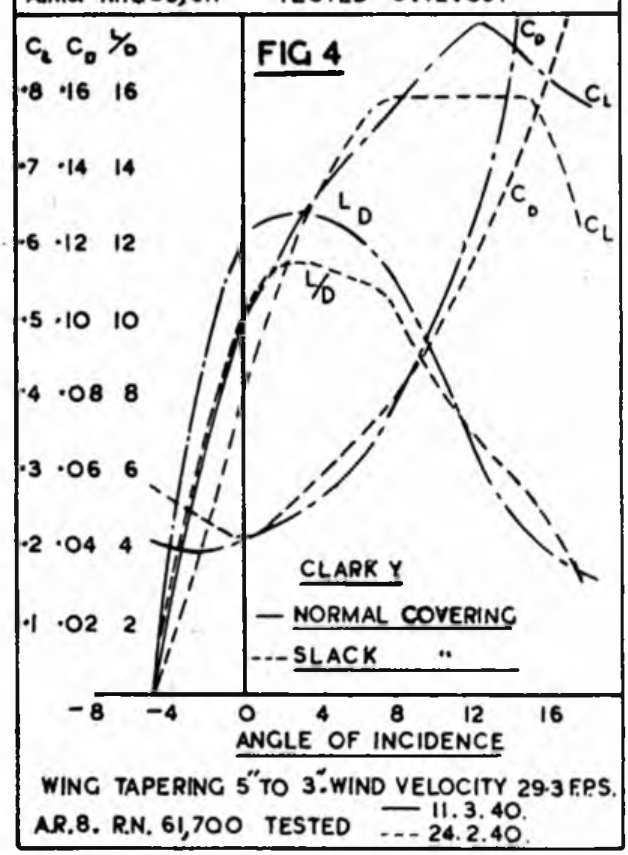
Thus, the airfoil does not appear to be outstanding in any way; the only unusual feature appears to be the very flat top to the C_l curve.

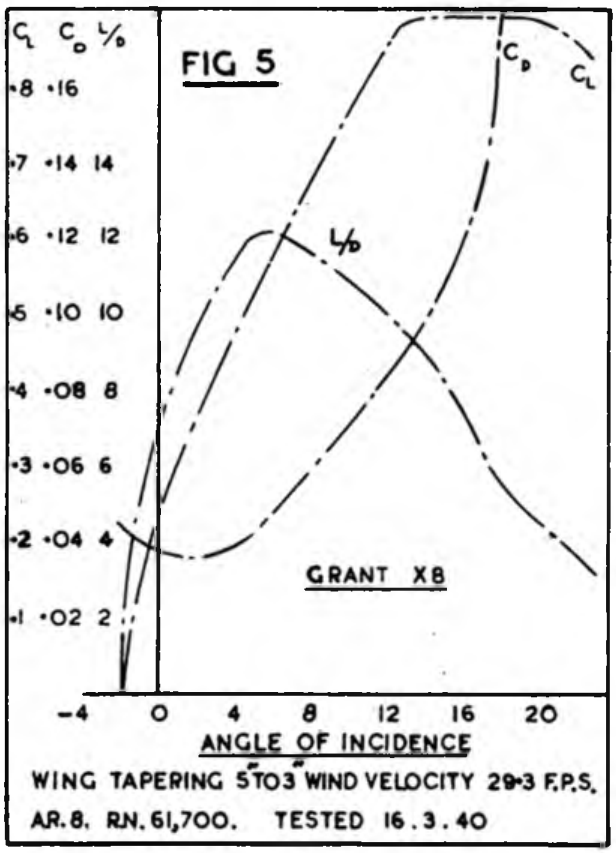
Tests on Fuselage Models.

We were interested to see whether there was any marked theoretical advantage in using fuselages of circular cross-section rather than rectangular. We therefore constructed two small solid balsa fuselage shapes. These had a normal streamline profile, with the greatest cross-section at a distance of one-third the length from the front. They were each 13 in. long, with a maximum area of cross-section of 1·815 sq. in. In order to give results which could be applied to Wakefield type models they were tested at about 40 m.p.h. (Reynolds Number is proportional to speed × length, so that for a model one-third the length of a Wakefield, the speed must be three times as great).

Readings of the drag of each set-up were taken at various angles of yaw.





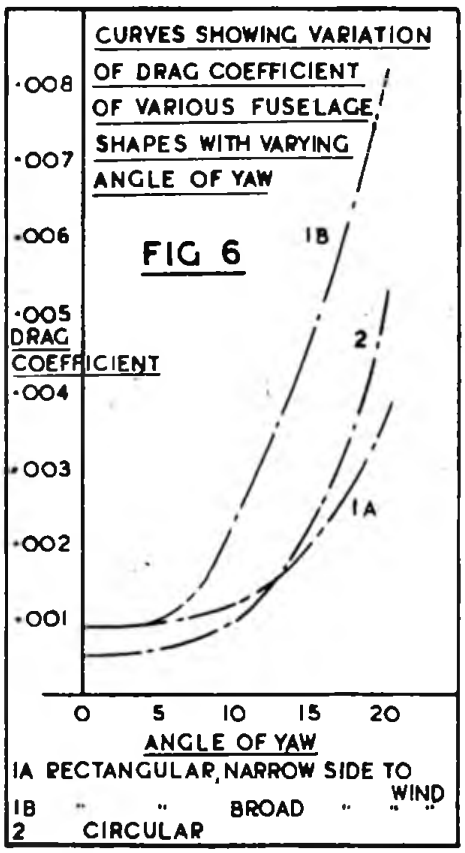


On inspecting these results, something at once appears to be wrong. For instance, K^1 for a round fuselage should be about ·0005. Also, the drag of 1(*a*) and 1(*b*) at 0° yaw should obviously be the same. These discrepancies are caused by the large amount of interference drag between the rod and the model. To correct for this effect, the value of K^1 for the circular fuselage at 0° is made equal to ·0005, and thus a value of the interference drag is obtained. This is subtracted from the drag at the other angles of yaw, and new values of K^1 are calculated.

Angle of yaw.	Drag (in lb.).			$K^1 = \frac{\text{Drag}}{AU^2}$		A = Cross-sectional area in sq. ft. U = Wind speed in f.p.s.
	1 (a) 63 f.p.s.	1 (b) 60 f.p.s.	2 60 f.p.s.	1 (a)	1 (b)	2
0°	·01115	·00718	·0055	·00223	·00158	·00121
5°	·01155	·00767	·00586	·00230	·00169	·00129
10°	·01277	·0132	·0075	·00255	·00290	·00165
20°	·02465	·0391	·02575	·00419	·00860	·00568

A similar value of the interference drag for 1(*b*) is subtracted from each of the readings, and new values of K^1 calculated. The values for 1(*a*) are adjusted in a similar way so that the drag coefficient at 0° is the same as that for 1(*b*). The corrected values are as follows, and are expressed graphically in Fig. 6.

Although, on account of the rather roundabout method by which these coefficients were obtained, they should not be taken as being very accurate, yet they give us an idea of the relative merits of the three layouts. 1(*a*) is equivalent to a model climbing steeply at a high angle of attack; 1(*b*) is equivalent to a model flying in tight circles under the action of rudder and side-thrust; 2 is equivalent to both of these.



Angle of yaw.	True K.		
	1 (a).	1 (b).	2.
0°	·00087	·00087	·00050
5°	·00095	·00098	·00058
10°	·001192	·00220	·00094
20°	·00356	·00792	·00497

We see, then, that for a model which is going to fly fairly fast and climb steeply, the round fuselage (2) has a definite advantage over 1(*a*) until the angle of attack reaches 15°. (Angle of attack being defined as the angle between the airstream and the centre-line of the fuselage). In all cases of a model turning in circles, the round fuselage has a definite advantage over the flat-sided one. (Compare graphs 2 and 1(*b*)).

Therefore, from these results we see that (i) a round fuselage is definitely more efficient than a rectangular section one at moderate angles of attack; and (ii) it is very important to design our models so that the angle of attack is kept small. We must try to arrange that the model flies as nearly as possible along the direction of the centre-line of the fuselage, both in power flight and glide, i.e. we must give our wings sufficient incidence relative to the centre line, and we must also avoid flying in very tight circles.

(*Concluded from page* 422).

to its original position. Place on the bottom plate under the full movement of the pointer a piece of white paper. This will act as the scale on which to mark the various turns of the motor. Spring G should be very light, just sufficient to return rod D to zero.

The Operating Mechanism.

The arm I is bent to the shape shown and is mounted on the back of nose-block in eyes J, in which it is free to move, being retained in position by washers K. On the lower end, which is bent to a right-angle, as is the top, an eye is formed through which the airscrew spindle passes freely, but is prevented from moving unduly by washers L, which are soldered to the spindle. It will be seen by this that as the airscrew spindle is moved back by the pull of the rubber motor the arm I will be taken back with it. This movement causes the top of the arm to press against the end of rod D, which moves back under this pressure, and so moves the pointer B. This completes the operating mechanism, with the exception of spring M. Now, on this spring depends to a large extent the proper working of the gadget. It may be a little troublesome to make this part, but a little experimenting with different gauges of spring wire will soon give the builder some idea of the tension required. The strength of this spring should be such as to match the pull of the motor, inasmuch as the motor is wound so the spring should be compressed in proportion. If the first one or two springs made are not satisfactory, do not discard the gadget in disgust, as a little more experimenting will undoubtedly produce one of the right strength. This spring does not revolve in the nose-block but rests up against the end of the bearing bush, and the pull of the motor being taken by the thrust washers in the usual way on the outward end. This allows the spring to compress as the motor tension is increased.

Marking the Dial.

When the whole gadget is finished the dial can be marked for the various positions of pointer B to correspond to numbers of turns on the motor. The writer first wound motor up to absolute maximum and marked position of pointer B that number. The motor was then allowed to unwind and was then wound up to the three-quarters wound position, marked and allowed to unwind as before. After which the half-wound and quarter-wound positions were determined in the same way.

It will probably be found that the distance between the marks on the dial decreases as the motor is wound, there being a larger space between quarter- and half-wound and three-quarter and full turns. However, the idea gives a fair approximation of the number of turns on the motor at these respective positions without the bother of counting.

In conclusion, may it be said that many headaches caused through broken models can be avoided by the use of this idea, and providing the motor is kept the same and well lubricated for that particular marking on the dial, it will prove its worth in good service. It must be remembered, however, that should a different motor be fitted the positions on the dial may not suit and a new dial must be marked to suit the new motor, and possibly a new spring M may be necessary as well. But with most modern machines the right motor is installed in the first place, and this gadget should only be fitted to these when only one marking will be required.

BUILD THE HENSCHEL S.R.

USING THE FULL-SIZE SCALE OF THIS ISSUE

THE new German Air Force is composed of some of the finest 'planes in the world. Right from the four-motor bombers down to the light trainers, Teutonic thoroughness is depicted.

The Henschel Short Reconnaissance 'plane is used extensively by the *Luftwaffe*, as the German Air Force is called. It is built by the Henschel Company at their new plant, situated in a little village called Schonfeld, on the outskirts of Berlin, and is typical of the observation class, as we should term it, the high-wing arrangement offering excellent visibility.

The ship is powered by a B.M.W. " Hornet " and carries amongst its very complete equipment a two-way radio. It is a two-place job, having a gunner-observer in the back pit.

The German war-time ships have been great favourites with modellers, and if you have been keen on Fokker and Albatross ships, then here is what you have been looking for—a combination of the Black Cross and a modern 'plane, as well as a worthy addition to your collection, so let's get on with the model.

Start first on the fuselage with the jig stringers or master stringers. After joining the two plates of the fuselage together, slip a sheet of carbon paper underneath and transfer the outline of the jig stringers on to medium $\frac{1}{16}$ in. sheet, running, of course, with the grain. After cutting out the jig stringers, take the formers; the first three are from $\frac{1}{16}$ in. sheet, for strength, and the next from $\frac{1}{32}$ in. sheet. Mark the position of the $\frac{1}{16}$ in. square stringers, but leave the actual cutting until the fuselage is lined up, then mark the position of the formers from the plan on to the jig stringers, and cement in position. Next comes the $\frac{1}{32}$ in. sheet stiffening for the cabane struts and the landing gear; this will have to be put on in two sections, owing to the curvature of the fuselage; make the joint of the two sections on former " D." A better finish can be obtained if the two-place cockpit is cut out after the sheet is cemented in place. Add the celluloid wind-shield and the little oil cooler, the construction of which may be seen in the plans. A stub of $\frac{1}{8}$ in. dia. reed and a scrap of $\frac{1}{8}$ in. sheet constitute the dummy tail-wheel.

LIST OF

Four $\frac{1}{16}$ in. × $\frac{1}{16}$ in. × 12 in. strip balsa.
Four $\frac{1}{16}$ in. × $\frac{1}{8}$ in. × 12 in. ditto.
Three $\frac{1}{16}$ in. × $\frac{1}{4}$ in. × 12 in ditto.
Two $\frac{1}{8}$ in. × $\frac{1}{8}$ in. × 12 in. ditto.
Two $\frac{1}{8}$ in. × $\frac{1}{16}$ in. × 12 in. ditto.
One $\frac{1}{4}$ in. × $\frac{1}{4}$ in. × 12 in. ditto (hard).
One $\frac{3}{8}$ in. × $\frac{1}{16}$ in. × 12 in. ditto (hard).
Two sheets silver tissue.
Three $\frac{1}{32}$ in. × 2 in. × 12 in. sheet balsa.
One $\frac{1}{16}$ in. × 2 in. × 12 in. ditto.

The usual rear hook is replaced by a bamboo dowel set in a piece of hard $\frac{1}{16}$ in. sheet on either side of the fuselage. The rubber may be passed round this dowel or an " S " hook may be used, which was done on the model shown. The dowel is not cemented in but should be a push fit in the sheet.

Cowl.

The cowl is cut from $\frac{1}{32}$ in. sheet of medium grade formed round two discs, one of $\frac{1}{16}$ in. sheet and the other of $\frac{1}{8}$ in. sheet, with the front built up of two discs of laminated $\frac{1}{8}$ in. sheet.

The nose-plug is backed with a piece of cork $\frac{1}{4}$ in. × $\frac{1}{8}$ in., which fits tightly into the slot shown in former " A." The cylinders can be cut from $\frac{1}{8}$ in. sheet and cemented round former " A "; mark the fins on with black ink or strips of black cotton. Bush the nose-plug with aluminium tube. When dry, the cowl can be cemented on to the front of the fuselage, using plenty of cement.

Empennage.

Build up one half of the elevator on the plan, and while this is drying work on the fin. The fin ribs are cut from $\frac{1}{32}$ in. sheet and slotted at the rear to take the $\frac{1}{32}$ in. sheet edging. The $\frac{1}{8}$ in. square strip half-way up the fin is the seating for the tail-plane, and should be cemented in strongly; after you have finished the fin, remove the one half of the elevator and build another exactly the same. Cover the two halves with a separate piece of tissue for top and bottom and pin down to your bench to prevent warping. Spray with water and dope lightly; when dry, cement the two halves to the fin and attach the $\frac{1}{16}$ in. sheet struts " Z," after carefully lining up the elevator horizontally.

Wing.

The two wing panels are shown in the plan; cover with wax paper and pin down your leading edges; the tapering can be done when the wing is complete. Cut the ribs from $\frac{1}{32}$ in. sheet, except the root ribs, which are cut from $\frac{1}{16}$ in. sheet. Frank Zaic's spar system is

Design by STAN. D. MARCH

PLANS IN THE CENTRE PAGES AND ON PAGES 440-1

MATERIALS

One $\frac{1}{8}$ in. × 2 in. × 12 in. sheet balsa.
One $6\frac{1}{2}$ in. × $\frac{3}{4}$ in. × $1\frac{1}{4}$ in. block balsa (hard).
1 in. aluminium tube, ·025 gauge.
12 in. ·025 wire.
One cork.
One pair balsa or celluloid wheels, 1 in. dia.
1 oz. cement.
1 oz. banana oil.
8 ft. brown rubber, $\frac{1}{8}$ in.—30.
Two brass washers.
Small vial of red dope.
Strip celluloid.
Scrap of $\frac{1}{8}$ in. reed and bamboo.

employed, the spar being $\frac{1}{8}$ in. square medium grade. When piercing the holes for the spar in the ribs, note the difference in position of these holes for each rib. Thread the ribs on to the spar, after marking the position from the plan. Cut the trailing edge from $\frac{1}{16}$ in. sheet, also the cross strips, $\frac{1}{4}$ in. wide, for the cabane and main struts. While the wing panels are drying you can get on with the

Undercarriage.

This is very strong and light and will carry your 'plane through a lot of hard landings.

Start off with the two " V " struts, which are made from hard grade balsa. The built-up parts are open at the top and should be strongly cemented to the " V " struts. The bridge pieces are cut from $\frac{1}{8}$ in. sheet and grooved to take the wire bridge. This should be pushed through the sheet stiffening on the bottom of the fuselage and then the bridge piece cemented on, thus sandwiching the wire. Use plenty of cement in this operation, in case the fit on the bottom of the fuselage is not too good. Cement the " V " strut strongly to the wire. Use celluloid or laminated balsa wheels.

Propeller and Free-wheel.

The propeller is carved from a hard balsa block $6\frac{1}{2}$ in. × $1\frac{1}{4}$ in. × $\frac{3}{4}$ in., and blanked out as shown in the plan. Round off the corners and edges and carve carefully. Sand the propeller down and give a deep under-camber on the back. Take your time on the propeller, as the whole flying performance relies on this.

The free-wheel is of a well-known type, and although not essential, greatly improves the performance of the model, helping the glide considerably as well as ridding it of unrealistic " dead " motor approaches.

Colouring and Covering.

Cover the model with silver tissue, as this will save colouring weight. On the fuselage use a strip in between each pair of stringers, and on the wings use a separate piece for top and bottom of each wing, pinning them down to prevent warping. Paint a red ring round the motor cowling front. The black crosses may be cut from the plans, or, if you don't want to spoil your book, trace them on to thin paper with Indian ink; the numerals may also be made like this. The fin is painted with a red band and a black Swastika on a white circle cemented on.

Flying.

Owing to the high wing, the ship is very stable in flight and will probably need a little down-thrust. This can be accomplished by shaving a little off the bottom cylinder on the nose-plug until level flight is obtained. As usual, test the model if possible over tall grass. The model shown balanced without extra weights, but a little modelling clay may be needed in the cowl. Happy landings!

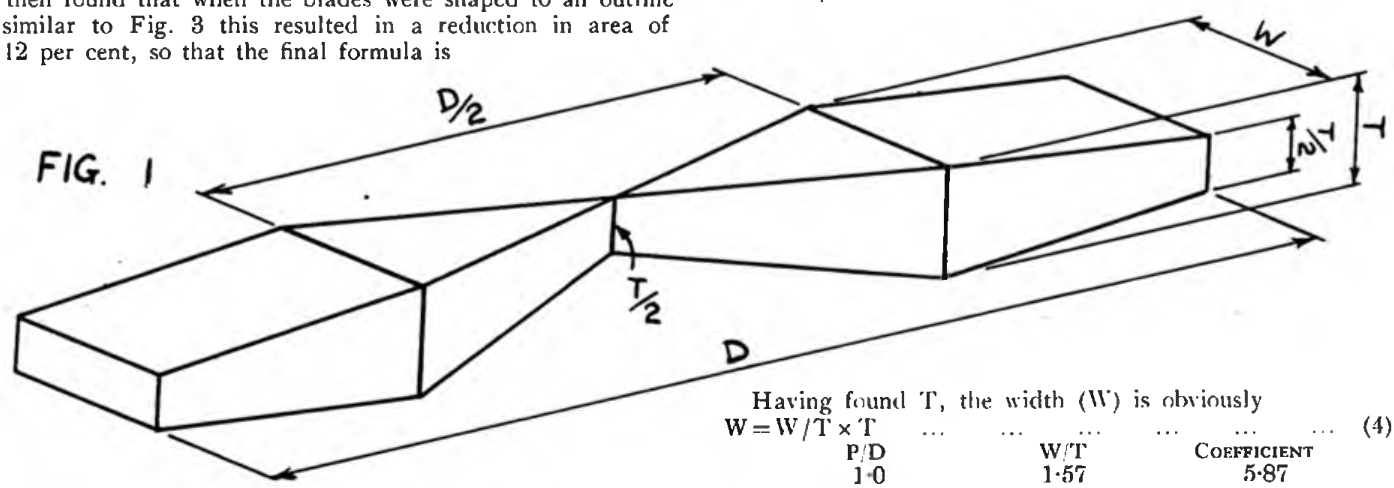
FINDING PROPELLER BLOCK SIZES

By J. H. MAXWELL

The symbols used are :

D = diameter of propeller.
P = pitch.
S_P = area of both blades.
W = width of block.
T = thickness of block.

A formula was developed which gave the area of the blades in their " blank " shape, that is, when the underside has been carved and the outline is as shown in Fig. 2. We then found that when the blades were shaped to an outline similar to Fig. 3 this resulted in a reduction in area of 12 per cent, so that the final formula is



$$S_P = 0{\cdot}22\ D\ (2\sqrt{T^2 + W^2} + \sqrt{(T/2)^2 + W^2} + T/2) \quad \ldots \quad (1)$$

This formula rearranged will give the block sizes, the thickness being obtained from

$$2\sqrt{T^2 + (W/T\ T)^2} + \sqrt{(T/2)^2 + (W/T\ T)^2} + T/2 = \frac{S_P}{0{\cdot}22\ D} \quad \ldots \quad (2)$$

If a numerical value is substituted for W/T in formula (2) T is the only unknown, and it can therefore be calculated. This numerical value is got from

$$W/T = \frac{\pi\ D}{2\ P} \quad \ldots \quad (3)$$

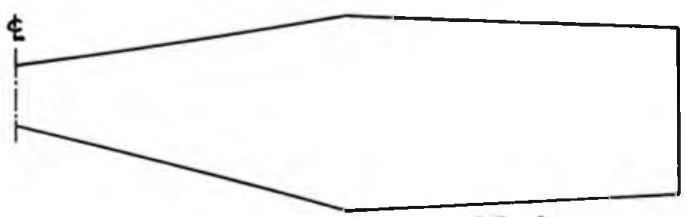


FIG. 2

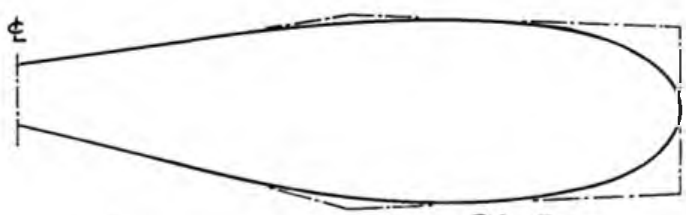


FIG. 3

Formula (2) simplified is

$$T = 0{\cdot}22\ D \times \frac{S_P}{\text{Coef.}} \quad \ldots \quad (5)$$

By means of these last three formulæ the block sizes for any propeller may be found, but those whose mathematics is not too strong will be glad to know that it is possible to give a table of values for W/T and also to simplify formula (2) by introducing a coefficient, both of these being dependent on the P/D ratio.

Having found T, the width (W) is obviously

$$W = W/T \times T \quad \ldots \quad (4)$$

P/D	W/T	Coefficient
1·0	1·57	5·87
1·1	1·43	5·5
1·2	1·31	5·2
1·3	1·21	4·95
1·4	1·12	4·74
1·5	1·05	4·56
1·6	0·98	4·4
1·7	0·92	4·27
1·8	0·87	4·15
1·9	0·83	4·06
2·0	0·79	3·98

In order to make the procedure quite clear, let us take an actual example.

Suppose we wish to make a propeller for a duration model of 200 sq. in. wing area and 45 in. span. Now, we have no intention of trying to tell you what are the best proportions for a propeller, as you probably know as much about that as we do at present, so for example we shall follow the general practice.

D = 40 per cent wing span = 18 in.
P/D = 1·5
S_P = 15 per cent wing area = 30 sq. in.

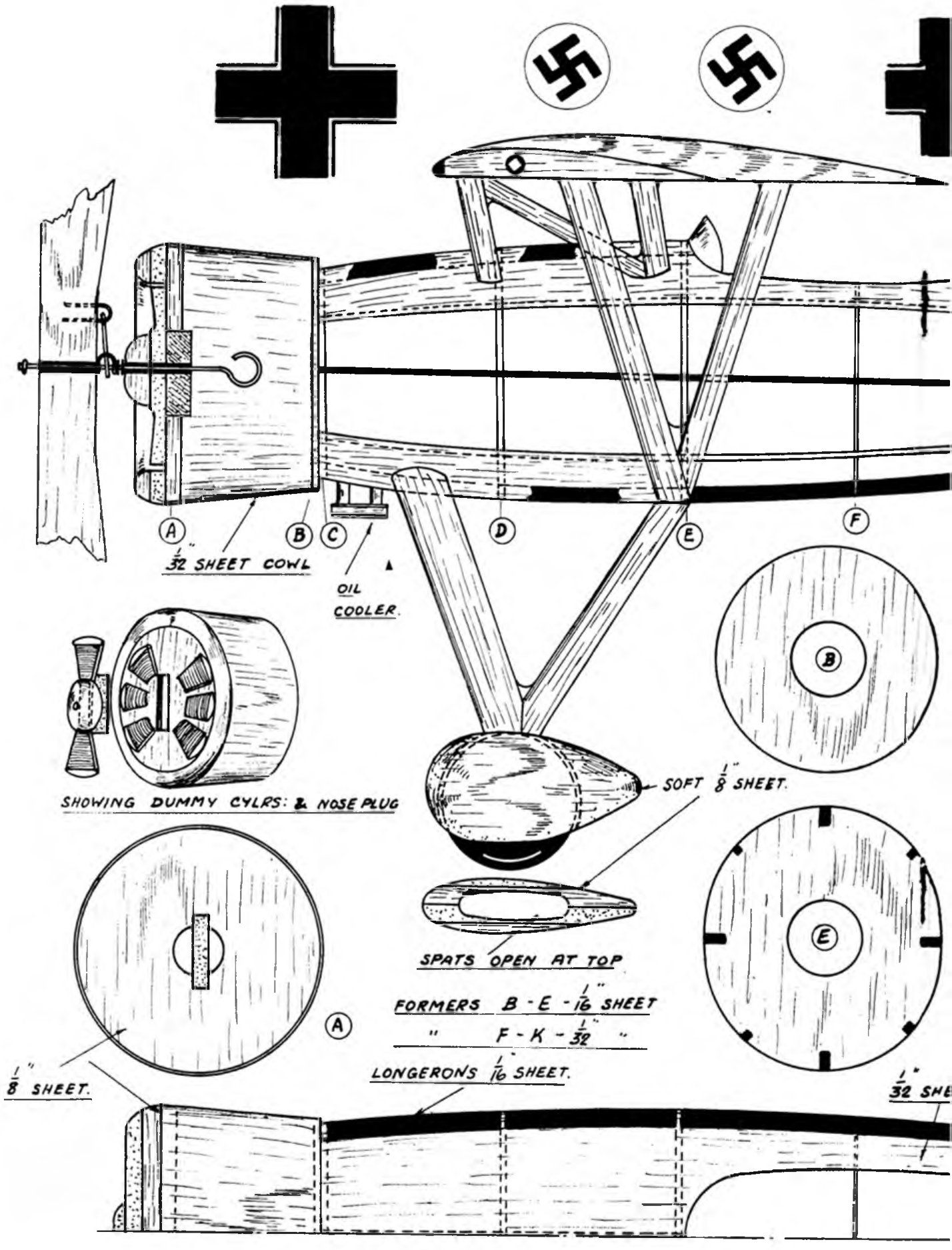
Substituting the values for D and S_P, and the appropriate coefficient in formula (5) we get

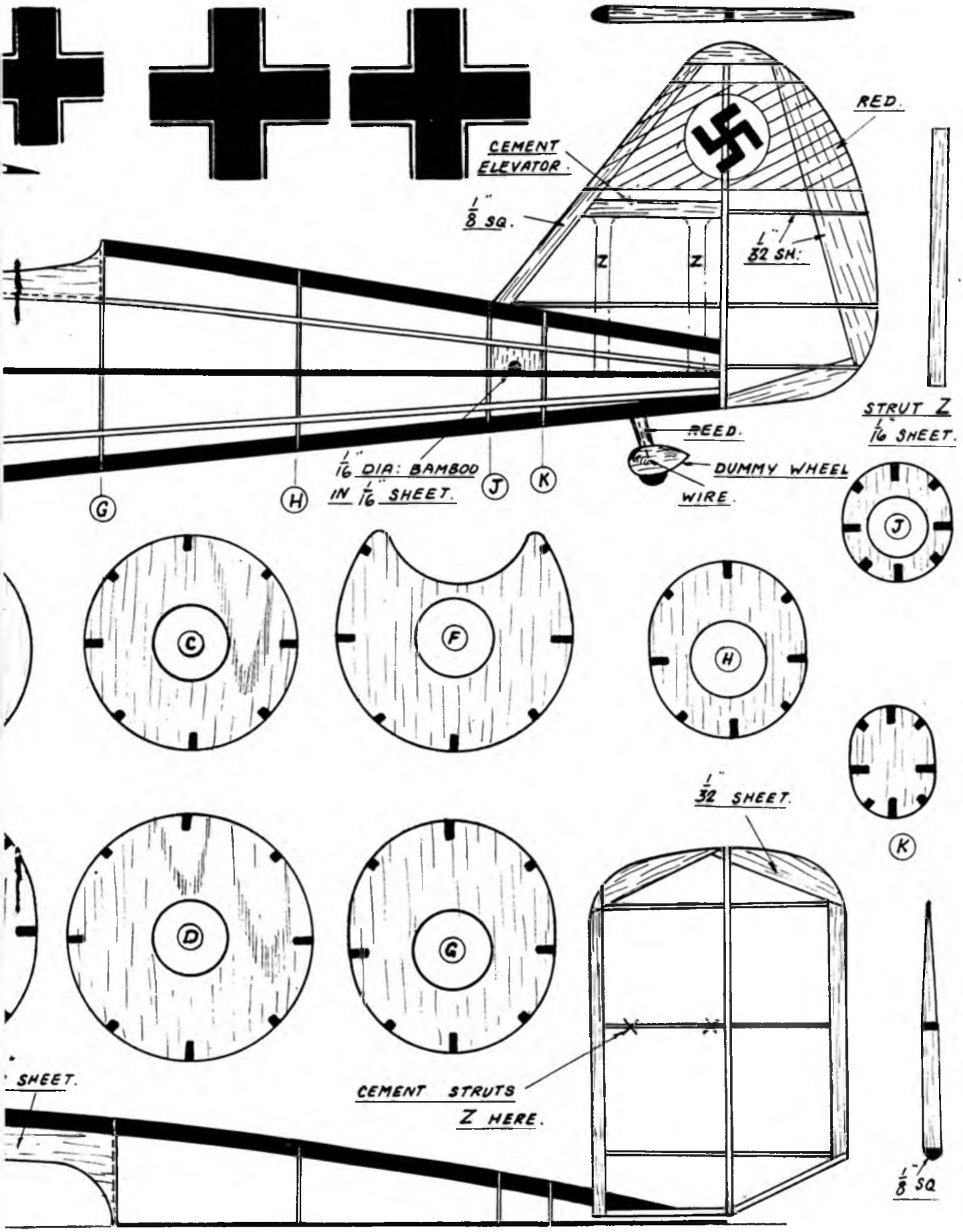
$$T = \frac{30}{0{\cdot}22 \times 18 \times 4{\cdot}56} = 1{\cdot}66 \text{ in.}$$

Taking from the table the value for W/T we get the width from formula (4).

$$W = 1{\cdot}05 \times 1{\cdot}66 = 1{\cdot}74 \text{ in.}$$

Our propeller block, therefore, is 18 in. × 1·74 in. wide × 1·66 in. thick, and provided it is laid out according to Fig. 1, the finished propeller will have the desired proportions.





DESIGNS FOR THE SCALE MODEL BUILDER—VII

By PETER GARROD CHINN

SO far, I have not dealt with any Fleet Air Arm 'planes, and since they have been doing such good work in Norway, I am starting off this month's article with a fleet-fighter-dive-bomber—the Blackburn " Skua." At the time of writing " Skuas " have been in action against German warships at Bergen. Twenty-four " Skuas " have recently dive-bombed and sunk an enemy cruiser. A Nazi transport and a submarine are also believed to have been sunk by " Skuas " at Bergen.

The first shipboard monoplane to be put into service in this country, the " Skua," is an all-metal, stressed-skin, two-seater fighter and dive-bomber. It is fitted with a Bristol " Perseus " sleeve-valve motor developing 905 h.p., and driving a controllable-pitch metal propeller, which gives the machine a maximum of 225 m.p.h. at 6,500 feet. Cruising speed is 187 m.p.h. at 15,000 feet, and landing-speed 75 m.p.h. Service ceiling is 20,200 feet.

A feature of the " Skua " is the metal monocoque fuselage, which is watertight up to the coaming, thus allowing the 'plane sufficient buoyancy to keep afloat for a considerable period, in the event of a forced landing in the sea. Special wing-flaps fitted below the trailing-edge assist landing and take-off, and can also be extended to restrict diving-speed during bombing.

A distinguishing point about the machine is the arrangement of the tail-surfaces, the fin being set well ahead of the tail-plane, as on the Gloster F.5/34 fighter. Other features by which the " Skua " can be recognised are the slightly upturned wing-tips and the conspicuous cockpit enclosure.

The undercart is retractable, and when extended has rather a lanky appearance, due largely to the small size of the wheels. Large wheels, of course, are unnecessary for operation from the smooth regular surface of aircraft-carrier decks.

Armament on the " Skua " consists of four small-bore (7·9 mm.) machine-guns fixed to fire forward (two in each wing) and one gun on a flexible mounting in the rear cockpit. The later version of the " Skua," the " Roc," which was first produced last year, and is used for fighting only, has a Boulton-Paul power-operated, multi-gun turret in place of the " Skua's " single gun. Probably four 7·9 machine-guns are contained in the " Roc's " turret like the Boulton-Paul " Defiant " two-seat fighter now coming into service with the R.A.F.

Main dimensions of the " Skua " are as follows: Span, 46 ft. 2 in.; length, 35 ft. 7 in.; height, 12 ft. 6 in.; and wing-area, 312 sq. ft.

The " Skua " should build up into quite a good flying model. A half-inch to the foot scale model would have nearly 80 square inches of wing area, which should make for low wing-loading. The length of the undercart and its position under the wing raises the nose high above ground level, which will allow good clearance for a large propeller. As regards the tail surfaces, it would probably be necessary to enlarge these—the area of the rudder and fin at least would have to be increased, as the wing is placed rather far back, and the centre of gravity will therefore be in such a position as to allow the side area of the nose to " do its stuff."

A new French fighter which is just going into service with the Armee de l'Air is the Dewoitine D.520. This machine has a considerably better performance than the fighters France has hitherto produced, and will no doubt contribute largely to maintaining Allied superiority in fighter aircraft.

Unlike the well-known Morane-Saulnier MS.406, the Dewoitine is an all-metal machine, although in common with other French single-seaters it is quite a small machine, having a wing-area of only 150 sq. ft. and a gross weight of less than 5,000 lb. The power-unit is a Hispano-Suiza " Moteur-Canon " of the 12Y series, but is a more powerful type than that fitted to the Morane, probably delivering somewhere around 1,000 h.p. This gives the D.520 a maximum speed of about 340 m.p.h., as against the 309 m.p.h. of the Morane, and the 317 m.p.h. of the bigger American Curtiss, also in service with the French.

The new machine has considerably better climbing powers than either the Morane or Curtiss, or our " Spitfire " or " Hurricane," the initial rate of climb being near the 4,000 feet per minute mark. Its relatively high wing-loading—32·3 lb. per sq. ft.—will, however, make it less manœuvrable than the other Allied fighters, and in this respect it may be assumed that the D.520 has been designed primarily as a " bomber-chaser " rather than a " dog-fighter." The high rate of climb and high top speed will make it an excellent machine for tackling raiders, but whether it can possess the mastery over German fighters that other Allied fighters, notably the " Hurricane " and Curtiss, have demonstrated, is another matter.

That the Dewoitine is a very efficient machine is indicated by the fact that, despite its wing-loading, the landing-speed is only 70 m.p.h. The German Messerschmitt Me.109, which has a similar wing-loading, lands at 75 m.p.h. or more, even though Handley-Page slots and flaps are used.

Like the MS.406, armament consists of an engine-mounted shell-gun and two ·30-calibre machine-guns, although since the eight guns of the " Hurricane " and " Spitfire," and six guns of the Curtiss, have so far proved superior, no doubt the D.520's armament will be supplemented by at least two more machine-guns.

The Dewoitine D.520 has a wing-span of 33 ft. 5 in., a length of 27 ft., and a height of 8 ft. 6 in.

From drawings so far obtainable, the general proportions of this design seem to promise a reasonably well-performing flying-model, although the small wing-area is bound to make such a model rather fast. The main difficulty will probably be in keeping down the weight of the fuselage, since this is of rather " fat " proportions, and would need a fairly detailed construction in order to preserve its shape. However, further comment will be justified when more detailed drawings are available.

For this month's " cutaway " drawing of a typical flying-scale model, I have selected the Supermarine " Spitfire " fighter of the R.A.F. Space in the December issue permitted only a brief description of the " Spitfire," so a more detailed account of the full-size machine will not be out of place now.

The prototype of the " Spitfires " now in service with

home defence squadrons was produced in 1936, and was the outcome of the F.7/30 fighter of 1934, and the still earlier Schneider Trophy entries.

The first production machines went into service a little less than two years ago, and by this time various refinements, including the use of ejector type exhausts, had increased the maximum speed from 346 m.p.h. to 362 m.p.h. Later models were then equipped with de Havilland-Hamilton triple-blade controllable-pitch airscrews, and the top speed was further improved to 367 m.p.h.

The Rolls-Royce "Merlin II" motor, operating on 100-octane fuel, fitted to the latest "Spitfire" develops about 1,250 h.p., and this is said to give the machine a maximum speed of over 385 m.p.h. The initial climbing speed has, no doubt, also been improved over the original figure of 2,300 f.p.m.

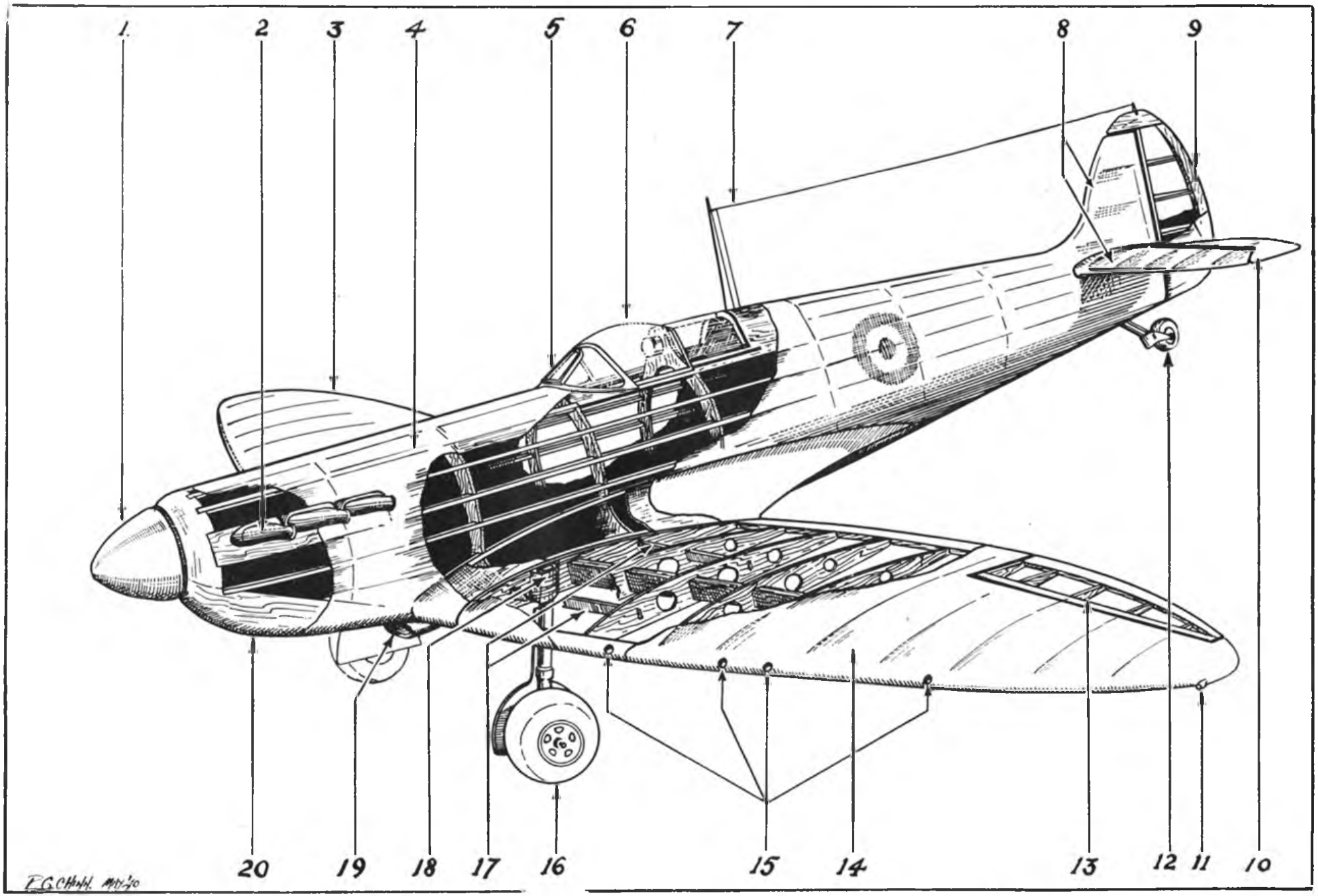
The "Spitfire" is thus still the world's fastest *service fighter*. Other countries have produced faster machines; Germany is believed to have new Heinkel and Focke-Wulf fighters capable of between 370 m.p.h. and 400 m.p.h., while the U.S.A. has, during the past eighteen months, built fighters definitely capable of more than 400 m.p.h. But the "Spitfire" is still the fastest fighter *to be in service in large numbers*, and this country will probably continue to possess the fastest service fighters, for beside the fact that we shall probably be buying from the United States, rumours are current that a new Supermarine fighter capable of 435 m.p.h. is being produced, and also a new Westland twin-engine machine capable of 400 m.p.h.

A special version of the "Spitfire" was built last year for the purpose of attacking the landplane speed record. This machine had a specially boosted "Merlin" motor, and, of course, was stripped of all unnecessary equipment. The wing area was reduced, and the whole of the external surfaces given a very high polish. One or two further modifications, including the fairing of the cockpit hood, were also made, and the machine was fitted with a four-bladed fixed-pitch airscrew. Unfortunately, the speed record was raised to 464 m.p.h. by the Heinkel He.112U, and subsequently to 469 m.p.h. by the Messerschmitt Me.109R, before the special "Spitfire," which achieved about 420 m.p.h., could have a shot at it.

The "Spitfire" has, of course, proved to be one of the most successful designs for a flying-scale model fighter. The reason for this may be attributed to the clean design, slim lines of the fuselage, and fairly generous wing area. The main dimensions of the full-size machine are: Span, 36 ft. 10 in.; length, 29 ft. 11 in.; and height, 11 ft. 5 in. Wing area is 242 sq. ft., and aspect ratio 5·65.

The drawing shows a model to an approximate scale of ¾ in. to the foot. A model of this size allows refinement in design, and the inclusion of certain details, such as movable controls, etc., although, of course, as on previous models, these are marked as optional. No constructional difficulties are likely to be encountered, as the "Spitfire" lends itself to a conventional structure. The problem of making the celluloid for the cockpit cover curve in two directions may be overcome by first soaking it in acetone, or by following the method given in "Scale Model Aircraft that Fly."

Wing panels are detachable from the fillets, being connected with bamboo plugs and balsa sockets. The undercarriage is shown its true scale length, but may be made longer to permit better propeller clearance. A three-bladed airscrew is probably best for this design, so that the diameter does not necessitate a "leggy" landing-gear.



VICKERS SUPERMARINE "SPITFIRE II" FIGHTER—KEY TO DRAWING OF SCALE MODEL.

1. Hollow spinner.
2. Dummy ejector-type exhausts.
3. Detachable wing panel.
4. Fuselage construction: formers, stringers and tissue covering.
5. Flat sighting panel.
6. Transparent cockpit enclosure.
7. Dummy aerial.
8. Fixed tail-surfaces.
9. Movable rudder.*
10. Movable elevator.*
11. Dummy navigation light.*
12. Non-retracting tail-wheel.
13. Movable aileron.*
14. Wing structure: Box-spar, perforated ribs, tissue covering.
15. Gun ports.*
16. Detachable undercart.
17. Wing attachment spars.
18. Undercart strut socket, rigidly mounted to root-rib
19. Dummy carburetter air-intake.
20. Hollow balsa nose-section.

* Denotes optional.

AUTOMATIC DETRACTING UNDERCARTS

By G. A. BAKER

NEARLY every builder of scale-type flying models has wanted to build a 'plane with an automatic mechanism which will release the undercart at the completion of the engine-run.

The mechanism described here is quite simple to install, and the extra weight has little effect on the duration of the model, owing to its lightness.

As seen in Fig. 1, the mechanism comprises :

(1) A propeller shaft A (to which is soldered two cup washers B).
(2) A sliding member C.
(3) Two pivoting members D.

The member C is allowed to slide freely in two pieces of tubing, which are bound and glued to ⅛ in. sq. balsa, these pieces of wood being glued horizontally to the formers.

One end of the member C is bent so that a loop (inverted U shape) is formed round the propeller shaft, while the other is bent at right-angles and engages the loops of the pivoting members D, which are glued securely to the root ribs.

The undercarriage, as shown in Fig. 3, is quite simple to construct and the axle is bent to engage the pivot member arm when it is in the *up* position.

A simple method of hinging the undercarriage is to drill a hole ⅜ in. from the top of the leg and insert a length of tubing, which is glued and bound ; a length of wire is then passed through the tubing and made fast to a wing rib.

A wire hook is fastened to the top of the leg, while another is fixed to a rib. Rubber bands passed over these two hooks complete the undercarriage.

After the motor has been wound both undercarriage legs are held in the *up* position and the pivoting members made to engage the bent axles by pushing the sliding member back. The nose-block is then fitted into place so that the cup washers on the propeller shaft will engage the sliding member when the free-wheel spring expands, thus moving it forward. The model is then ready for a hand launch, with the motor wound and the undercarriage up, as seen in position 1, Fig. 2. At the completion of the engine run the free-wheel spring expands, thus pulling the propeller shaft forward, the sliding member also moving forward, due to the cup washers engaging the looped end. This forward movement of the sliding member causes the arms of the pivot members to swing backwards, thus releasing the undercarriage legs which then " detract." (Position 2, Fig. 2).

As seen in Fig. 4, the free-wheel spring is dispensed with, rubber bands being used instead, these being looped round hooks G, being an extension of the sliding member, and F which is anchored to a former. Fig. 5 shows a " safety pin " type spring, which is very efficient.

Other types of undercart can be operated by this mechanism, these being the backward and outward retracting types, so that the modeller is not limited to one type and can incorporate whichever one he pleases.

The gauge of wire used for the mechanism depends on the size of the model, the writer using 20 s.w.g. wire on a model 21 in. long, which worked quite satisfactory.

A little experimenting is needed as regards the free-wheel spring, as this should be just strong enough to actuate the mechanism.

In conclusion, I might add that the looped end of the sliding member will swing to one side, thus allowing the motor to be wound without fear of it fouling the wire, and don't forget to oil all moving parts to eliminate friction as much as possible.

SOLID MODELLERS' "QUIZ"

By D. M. H.

1. How many guns would you put into the tail turret of a model of the latest type of Vickers Wellington?
   (*a*) Two.
   (*b*) Four.
   (*c*) Six.
2. In the French Air Force insignia, which colour is in the centre of the cockade?
   (*a*) Red.
   (*b*) White.
   (*c*) Blue.
3. In making models of these machines which would you equip with an *inward* retracting undercarriage?
   (*a*) Miles Master.
   (*b*) Hawker Hurricane.
   (*c*) Supermarine Spitfire.
4. A model of one of these R.A.F. machines should normally be coloured yellow. Which?
   (*a*) D.H. Tiger Moth.
   (*b*) Lockheed Hudson.
   (*c*) Bristol Bombay.
5. What type of guns would you model for a Supermarine Spitfire.
   (*a*) Lewis.
   (*b*) Vickers.
   (*c*) Browning.
6. The edges between the colours on a shadow-shaded Fleet Air Arm machine as used at present are :
   (*a*) Straight.
   (*b*) Zig-zag.
   (*c*) Wavy.
7. On a model of which of these machines would you use a single rudder?
   (*a*) Vickers Wellington.
   (*b*) Handley-Page Hampden.
   (*c*) D.H. Flamingo.
8. What are the colours of the latest R.A.F. cockades?
   (*a*) Red, white and blue.
   (*b*) Red and yellow.
   (*c*) Red and blue.
9. The Messerschmitt 110 two-seat fighter has—
   (*a*) A single engine.
   (*b*) One in each wing.
   (*c*) Two engines in tandem with the pilot and gunner between.
10. If you built a model of each of these machines with undercarriage retracted, for which one would you need no wheels?
    (*a*) Fairey Battle.
    (*b*) Vickers Wellington.
    (*c*) Airspeed Oxford.

(*Solutions on page* 457).

AUTOMATIC "DETRACTING" UNDERCARTS.

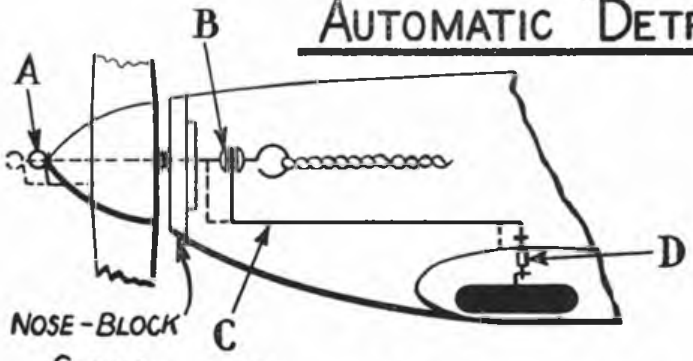
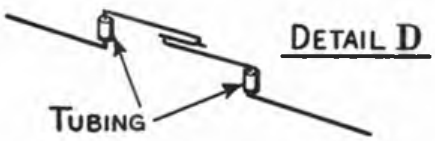
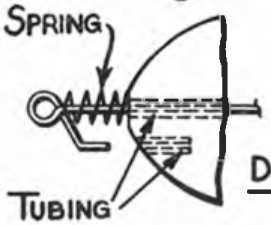


FIG.1





NOTE:- THIS TYPE OF MECHANISM CAN ALSO BE USED FOR MID & SHOULDER - HIGH WINGS.

HOW THE MECHANISM WORKS

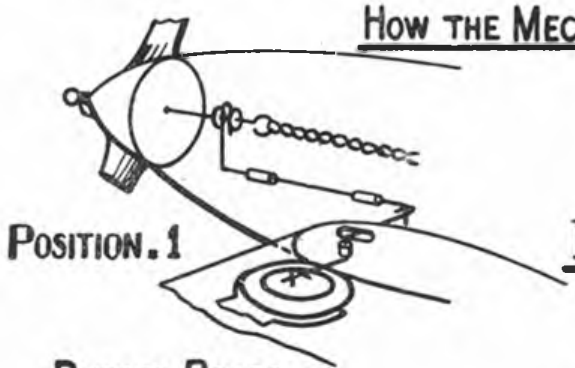
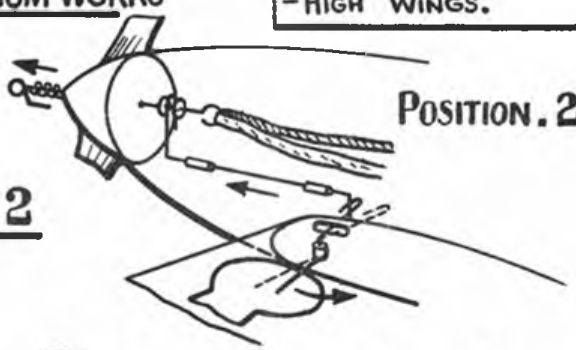


FIG.2



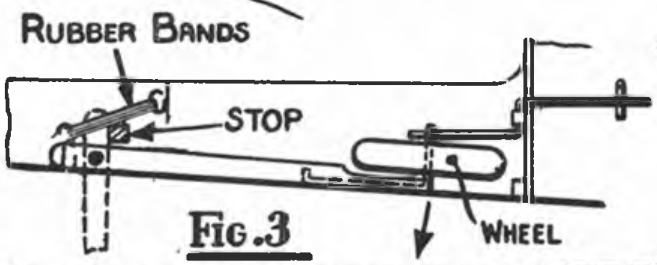


FIG.3

ALTERNATIVES OF SPRING ARRANGEMENT.

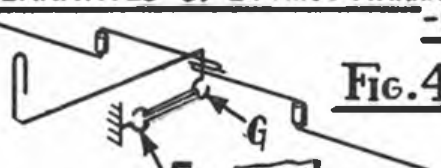


FIG.4

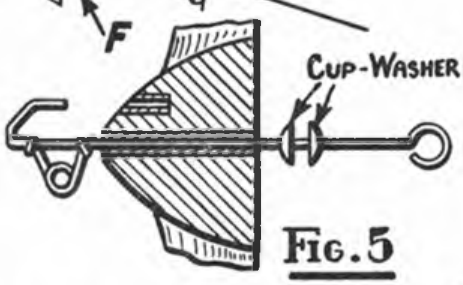
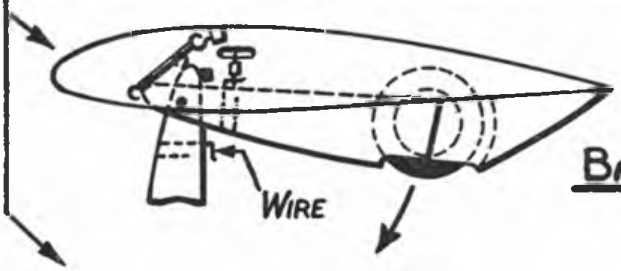
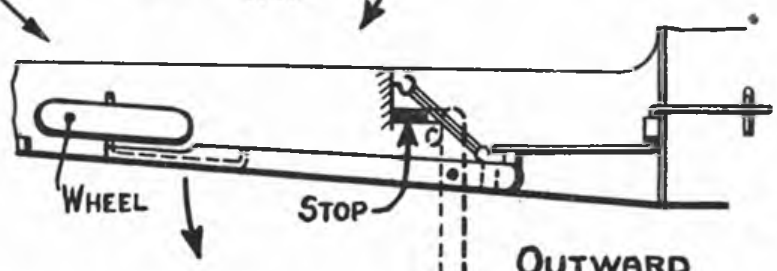


FIG.5

OTHER TYPES OF UNDERCART WHICH CAN BE OPERATED BY THE ABOVE MECHANISM.

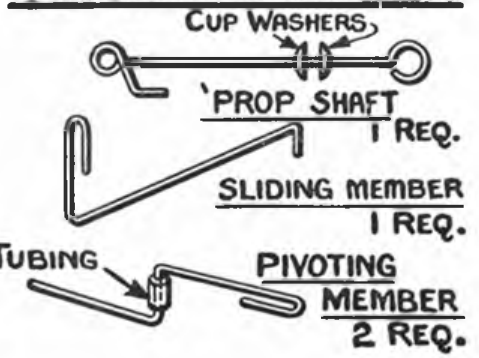


BACKWARD

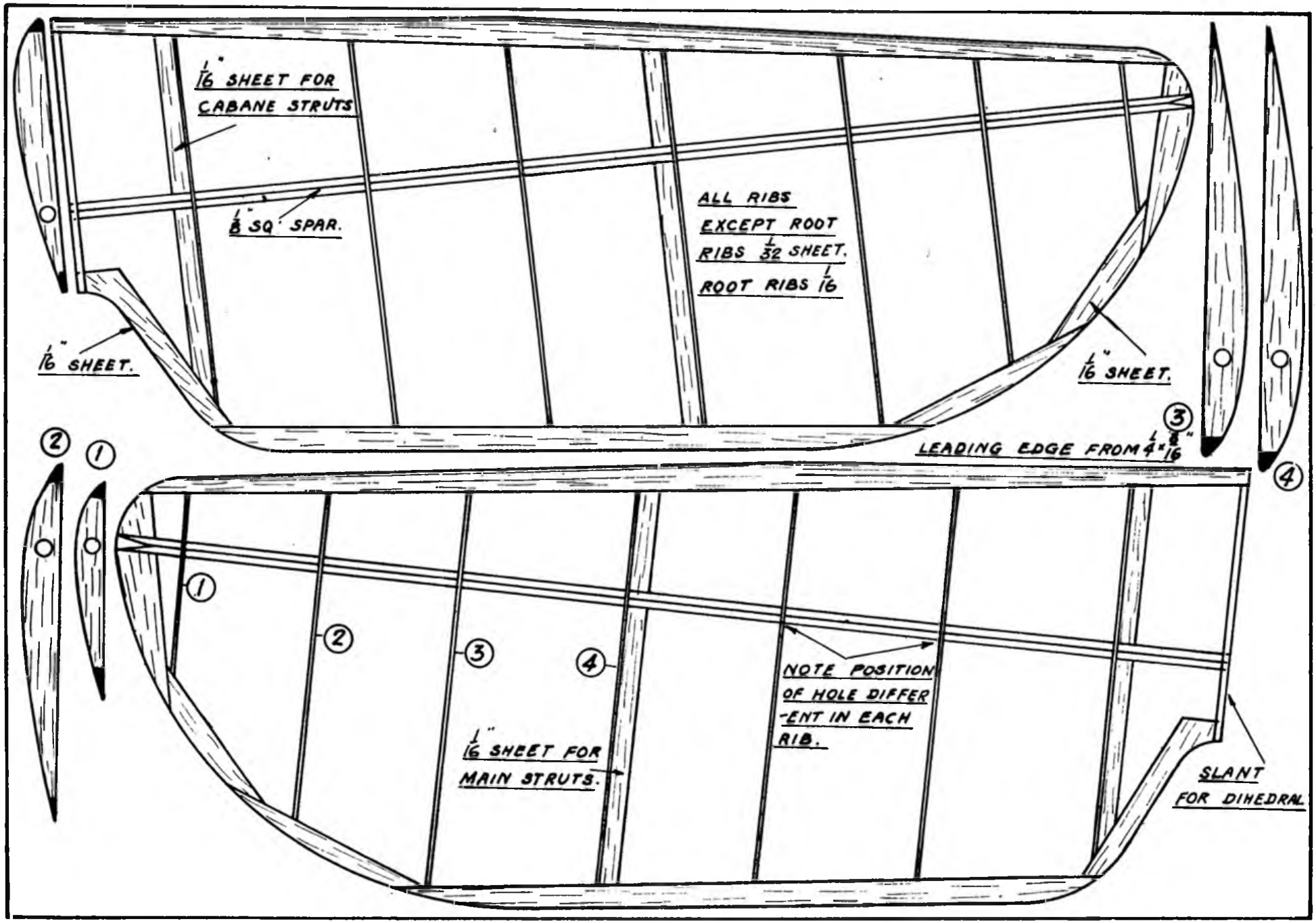


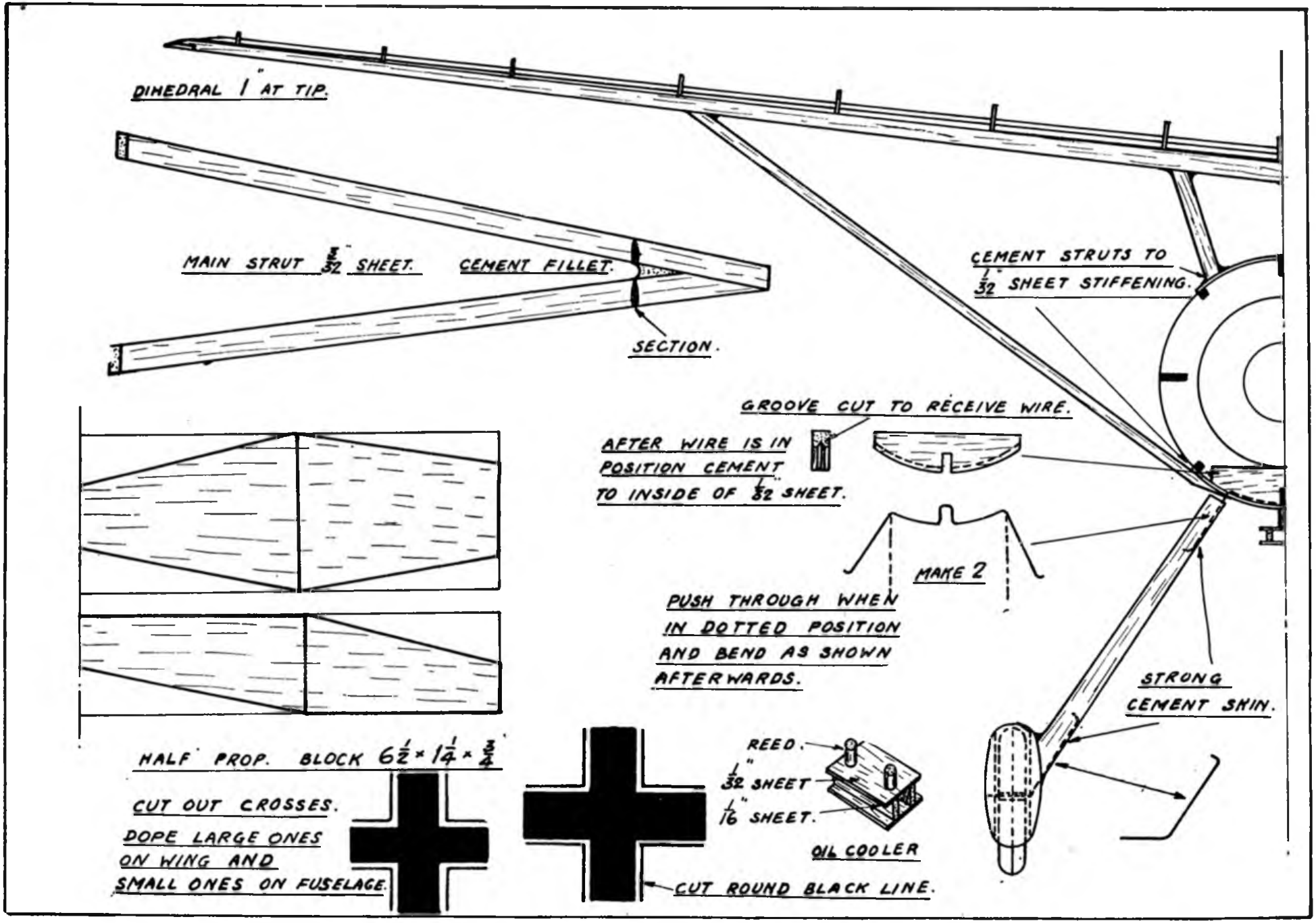
OUTWARD

COMPONENTS OF MECHANISM.



G.A.BAKER





MODEL AIRCRAFT

At left is shown one of the Empire flying boats, developped as a result of experiments made with a smaller 'plane—the "Scion Senior"—shown below. On the right is an experimental model of a giant flying boat built by the Saunders-Roe Company.

MODEL aircraft have been used in the aeroplane industry for wind tunnel testing purposes for many years, but owing to the somewhat erratic behaviour of flying model aircraft this latter type has been made little use of. Full size aircraft are not usually inherently stable like our models, and the guiding hand of the pilot is required to keep them on their course: If an aeroplane designer wished to predetermine the performance of a projected aeroplane by building a flying scale model he would, in order to make the model stable, have to make such modifications of tail areas, dihedral angle, etc., that it would eventually bear little resemblance to a full size machine, and would be useless for the purpose for which it was intended.

During recent years, however, aircraft have tended to become larger and, particularly among flying boat concerns, there has been an increasing demand for some means whereby to test the designers' theories before incorporating them in the prototype machine. One of the first aircraft firms to realise this necessity was Short Brothers, who had received an order from Imperial Airways for aircraft to replace the somewhat antiquated biplane type flying boats which were then being used on the Empire routes. As the order was somewhat urgent it was imperative to get the machine into production in the shortest possible period.

In flying boat design, the problems of making the machine stable on the water are almost as involved as those of making it stable in the air. To a certain point the general characteristics can be developed by means of wind tunnel and water tank testing, but as after making such tests the Short designers had still not been able to obtain sufficient knowledge to commence construction with a guarantee of immediate success, they conceived the idea of building a model of the machine, not a very small model, but one of about half the size which it was intended to make the flying boats.

Eventually this little 'plane was built, and it had a span of 55 feet. As the flying boats were to be powered with radial engines, the model was also fitted with radials, four Pobjoy Niagara 3s, each of which has an output of 95 h.p.

This model supplied all the remaining data required, so that it was possible to commence the construction of a large number of flying boats, the now famous Empire boats, before the first of the line had been launched.

The model, which was later marketed as a transport 'plane in its own right, with either landplane or float undercarriage, was christened The Short Scion Senior. From a photograph of the Scion Senior one can readily see that if the undercarriage were to be removed and wing tip floats added, the resemblance to the Empire flying boats would become very apparent.

Other flying boat concerns were not slow to realise the advantages gained by the building of such models, and the large American firm, Martin's, who had an order to build a large flying boat for the U.S. Navy, decided that it would be worth while for them also to construct a model, but chose a scale of one-quarter instead of one-half.

This little machine, which was called the Martin 162a, had accommodation for a pilot and observer, and by its use the Martin engineers were able to obtain sufficient information about the hull design and general construction that the full-size machine, an 18-ton patrol bomber, carrying a crew of seven, could be built with a minimum of difficulty.

The only radical difference between the full-size machine and the small model was in the inclusion of retractable wing floats instead of the fixed type. The gull-wing design and twin fins used on the model were all found successful

AS AN AID TO THE AERO-ENGINEER

By **H. McDOUGALL**

and were incorporated on the large machine, which was designated the Martin 162.

It is rather interesting to note that the Americans, who have, it must be admitted, gone very far in the development of radial engines, could not obtain radials small enough for the model in their own country, and had to take the somewhat unusual course of importing engines from England, and once again it was the ubiquitous Pobjoy that was found suitable. Indeed, this engine, which is a single row seven-cylindered radial, has played a key part in the development of these midget aircraft, and it is in itself an interesting piece of machinery. The airscrew drive is geared down, and the engine is fitted with a fixed pitch airscrew. As the overall diameter is only 26½ inches, it is probably the smallest radial engine in production in the world.

As well as the United States, France also decided that the scale model idea was worth a trial. The great Potez firm were intending to build a large flying boat for use on the trans-Atlantic run, and as it was proposed to make this a very large six-engined type, it was necessary to obtain as much data as possible before commencing construction of the machine.

The model which was then built was one of the most ambitious to date.

For the Potez 160, as it is called, a scale of one-third was chosen. Six 40 h.p. French Train engines supplied the power, and even in small scale the machine has a very imposing appearance.

Readers may possibly have seen a very interesting news-reel of this machine. With characteristic French photographic skill, the machine was filmed taking off the water against a background of trees, and as the camera was placed close to the water the 'plane was indistinguishable from a full-size aircraft until it came closer, when the pilot and observer were seen to practically fill the cabin. A six-engined two-seat aeroplane! So complete was this particular model that it incorporated such equipment as variable pitch airscrews and wing flaps.

Finally, there is the latest of this series of intriguing little aircraft, the new Saunders-Roe model. Unlike its immediate predecessor, the "Lerwick," this machine has four engines, once more the redoubtable Pobjoys, and is a really beautiful and imposing craft.

The span is 50 feet, and the model incorporates several up-to-date refinements, such as twin fins, dihedralled tail-plane and wing flaps. What size the production machine will be is a matter for conjecture, but if it keeps to the very fine aerodynamic lines of the model it should prove very successful.

So far as the writer is aware there have been no models built of landplanes. The reason for this is, of course, that in this country we have not made it general practice to build very large landplanes, and if the full-size machine is only to be of a moderate span there is little point in building a model. It is, nevertheless, rather surprising that our American friends, who are building some very large landplanes, have not more fully explored this avenue of research.

Nearly every aeroplane is, of course, a development of its immediate predecessor, and the ancestry of many types can be traced back as far as the last Great War.

Nevertheless, there are occasions when a large machine is developed directly from a small aircraft along similar lines to those just described. Such a case became apparent when the D.H. Albatross first appeared.

This was the first really large machine built by De Havillands for some time, and many people, on seeing its near-perfect aerodynamic form—for the Albatross is surely one of the finest examples of streamlining in existence—wondered how it had been possible to produce such a machine without extensive experience of this type of aircraft.

On looking back through the previous De Havilland aircraft, however, we do not have to go far before reaching the Comet, and although there does not appear at first sight to be much resemblance between this machine and the Albatross, on closer examination it becomes apparent that the Comet is in many respects a small scale model of the more recent machine.

In particular the most ingenious fairing of the engines into the wings of the Albatross is accomplished in much the same manner as in the Comet, except that whereas only 22 per cent of the engine frontal area was buried in the wing of the Comet, this had been improved to 55 per cent in the Albatross.

To we aero-modellers it is good to note that aircraft designers are interesting themselves in models, even though they are somewhat out of our sphere in the matter of size. Who knows—perhaps one day we will be called in to assist our more highly-qualified compatriots in solving their own peculiar problems, for there is no doubt that those who reign in high places are coming to realise more and more that the aero-modelling fraternity have a much more comprehensive knowledge of aerodynamics than they have been credited with.

THE SOUTH AFRICAN WAKEFIELD AND

By A. W. YARDLEY
and
V. C. GRACIE

Connolly's model leaving on its winning flight in the South South African Wakefield Championships.

THE 1940 South African Nationals and Wakefield Finals were held this year during April at Bloemfontein, in the Orange Free State, under the control of the S.A. Model Aeronautical Association, to which all clubs in South Africa are affiliated. This year the finalists were the guests of the Publicity Department of the Bloemfontein Municipality, and a total of 24 contestants assembled, and spent a very enjoyable four days in the " Centre City " of South Africa. Johannesburg (Transvaal) sent the largest contingent, numbering ten, and Pretoria (Transvaal), Durban and Pietermaritzburg (Natal) and Cape Town (Cape) all sent teams. The keenness of aero-modellers in South Africa can be judged when the distance contestants had to travel is considered. The Transvaal flyers had a journey of 300 miles, Durban 500 miles, and the Cape representatives 750 miles. Each team appointed a captain, who, under the leadership of veteran aero-modeller V. C. Gracie, of Cape Town, collaborated to run the events in a manner which pleased both competitors and spectators.

The weather was just the sort that aero-modellers always hope for, hot sunny days with occasional gentle breezes. This same hot sun, however, played havoc with rubber motors, and several ships were wrecked from this cause. The Municipal Aerodrome was placed at our disposal and proved a really ideal ground most suitable to our requirements.

The Junior Rubber Model event was first completed, and Wieholm, of Pretoria, proved a decisive winner by gaining the two first places with well-designed and perfectly trimmed models.

The Wakefield Finals were hotly contested, and Dalgety, the holder of the South African Wakefield Trophy for the last three years, was present to defend his title. He was unlucky to be put out early in the contest with a wrecked fuselage, due to a motor breaking when wound nearly to capacity. His beautifully streamlined model was flying perfectly in earlier trials, and his bad luck was deplored by all his team mates and rivals. Spargo, of Durban, who was much fancied, forgot that " spot of downthrust," and on his third flight his ship took off like a hurricane, and crashed under full power like a Messerschmitt! Becker, of Maritzburg, had trouble with his propeller shaft, and Yardley, of Johannesburg, turned up the winner after three consistent flights.

The Nationals Senior Rubber Contest provided many thrills—and a very close finish. Many fine models came forward for this event, and both single and double-bladed propellers were in favour. Several ships had single leg retracting undercarts that worked perfectly, and great strides have been made recently in this country in these two directions. Connolly, of Johannesburg, turned out the winner, and it was certainly a well-deserved and popular result. (His fine workmanship had already been seen in action in America, as he sent a model over to last year's Wakefield Finals, which was flown by proxy). The standard of flying was excellent, and Connolly and Yardley both turned in flights of 2¾ minutes.

In the sailplane contest J. Elliott's (Cape Town) machine, flown proxy by Van Schoor, was the winner with 79·5 seconds, after clocking in a first flight of 3 minutes 1 second.

The National Gas Model event was run under new rulings devised by the Cape Town Club to eliminate the possibility of " lucky " flights taking the cup, and we strongly recommend this type of contest to other clubs as well worth trying. Flight 1 earned points for take-off, stability, landing, originality of design and workmanship. Flight 2 was run under Bowden rules—a flight of not less than 40 and not more than 60 seconds; and Flight 3 was duration with 30 seconds maximum engine run.

The first place winners in the three National events were awarded beautiful silver trophies, donated by the Ford Company of South Africa, who did much to promote the movement in this country by sponsoring the national events at Port Elizabeth in 1938 and 1939. All the competitions were run off the first three days of the meeting, and the last day was organised to show the public of Bloemfontein that models really do fly, and the biggest crowd ever to assemble at the aerodrome thoroughly appreciated our efforts. The Bloemfontein Gliding Club brought out their two gliders, and African Air Transport came along with three D.H. Moths to give demonstrations of aerobatics and formation flying. Good organisation and a rapid continuity of events helped to make the afternoon an outstanding success. The meeting finished off with the presentation of trophies by the Mayor of Bloemfontein, who extended a very cordial invitation to competitors to come again next year.

South African Championship Results.

JUNIOR DURATION.

Weihahn, G. (Pretoria)	...	...	Average 114·5	sec.
Weihahn, G. (Pretoria)	...	...	,, 87·4	,,
Newman, G. (Pretoria)	...	...	,, 75·58	,,
Beyer, T. (Cape Town)	...	...	,, 73·00	,,

NATIONAL MODEL CHAMPIONSHIPS

SENIOR DURATION.

Connolly, P. A. (Johannesburg)	... Average	114·05 sec.
Yardley, A. W. (Johannesburg)	... ,,	113·00 ,,
Van Schoor, J. D. (Cape Town)	... ,,	99·00 ,,
Bertels, M. J. (Pretoria)	... ... ,,	98·5 ,,

OPEN PETROL POWERED.

Davies, L. W. (Johannesburg)	... ...	220·775 points.
Wannenberg, E. (Cape Town)	... ...	184·733 ,,
Tunmer, L. F. (Durban)	... ...	141·12 ,,

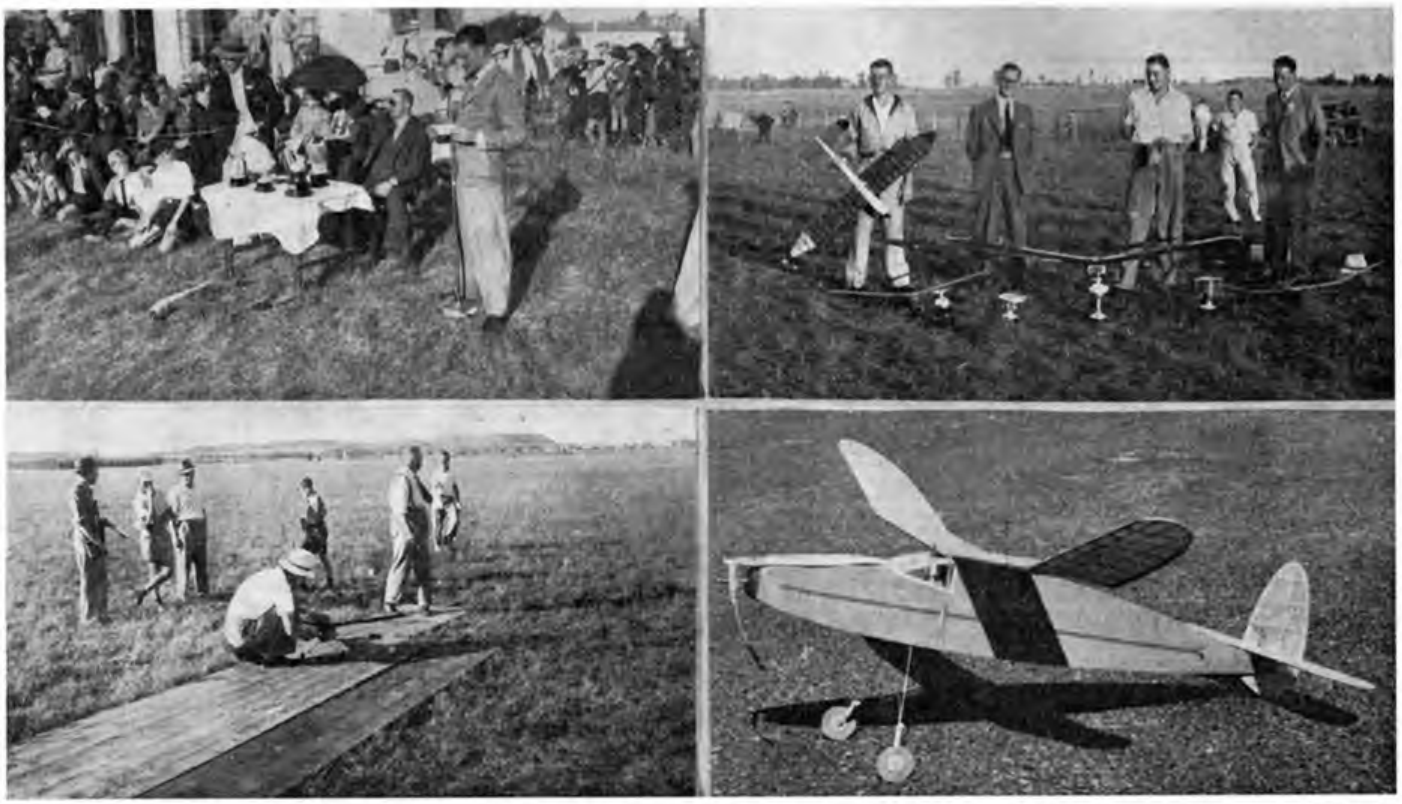
Possible points, 275.

SAILPLANE.

Elliott, J. (Cape Town)	... ... Average	79·43 sec.
Connolly, P. A. (Johannesburg)	... ,,	58·5 ,,
Bertels, M. J. (Pretoria)	... ... ,,	54·5 ,,

S.A. WAKEFIELD CHAMPIONSHIPS.

Yardley, A. W. (Johannesburg)	... Average	61·5 sec.
Becker, E. E. (Natal)	... ... ,,	44·3 ,,
Spargo, L. (Natal)	... ... ,,	27·416 ,,



(Top left) The Contest Directors do their stuff! Mr. Gracie, in charge of the Model Section, is seen to the left of the umbrella feeling to see if his return ticket is still safe!
(Top right) Gentlemen—the winners, Van Schoor (proxy for Elliott), Yardley and Davies.
(Bottom left) Tuning up for the "Gas" event. Just take a look at that field. Makes your mouth water, doesn't it?
(Bottom right) Yardley's Wakefield winner, a modified Korda.

S.M.A.E. REPORT

Notes on an Emergency Committee Meeting of the S.M.A.E. held at the Grafton Hotel, Tottenham Court Road, on Sunday, June 2nd, 1940.

Mr. A. F. Houlberg was in the chair

The minutes of the previous Emergency Committee Meeting were read, confirmed and signed.

A letter was read from Captain J. Laurance Pritchard. the Secretary of the Royal Aeronautical Society, in which he emphasized the necessity of model aircraft. The Committee decided, with Captain Pritchard's sanction, to publish this letter.

A letter was read from the Ulster Club, who have allowed their affiliation to lapse, requesting that they be allowed to enter the Gutteridge Trophy Competition. They desired permission to fly this competition, using their own timekeepers. The committee refused their request.

The question of the storage of the S.M.A.E. cups was considered, and Mr. Cosh and Mr. Hawkins had made enquiries for the removal of the cups to a safer place of storage. The committee decided that this should be done.

A letter was read from the Thames Valley Club regarding their prize in last year's National Competition. Mr. Hawkins stated that he had written this club about the prize and had received no reply. He had held on to the prize money until he received application for it.

The Rye Aero-Modellers' Club, with 25 members, and the Offerton M.A.C., with 17 members, were affiliated.

The following clubs were reaffiliated.

Bath.	High Wycombe M.A.C.
Chelmsford.	Leicester.
Egham & Dist.	Southampton & Dist.
Edgware.	Southport & Dist.
Furness M.A.S.	Wembley.
Hayes & Dist. M.A.C.	Woking.

The West Sussex Club were accepted provisionally.

Mr. Cosh had received quotations for the celluloid discs which will be attached to the arm band signifying official S.M.A.E. timekeepers. The committee decided to order one thousand of these armlets; the price will be fixed as soon as the actual cost is known.

Mr. J. C. Smith, Competition Secretary, brought to the notice of the committee several discrepancies in the timekeepers' sheets relating to the Gamage Cup. Seven clubs who had competed in the competition had not answered the postcard sent out some months ago asking for details of timekeepers. On the result sheets from other clubs it appeared that timekeepers had timed their own models, whereas actually other timekeepers had been present, but had failed to sign the result sheets. These queries had of necessity held up the results of the competition.

In order to give the clubs guidance in organising and running S.M.A.E. competitions, particularly those clubs who had recently changed their officials, it was decided to issue instructions which will be published in the Press. Mr. J. C. Smith, Competition Secretary, undertook this work

The Committee decided to issue pads as soon as possible for the use of timekeepers. These pads will be in duplicate form, and will contain the general competition rules.

An application from the Shorts' Club asking for permission to use their new ground for flying petrol models was granted.

The following records were passed :—

(*Continued on page* 457).

AIR DEFENCE CADET CORPS NOTES

By

DUTY PILOT

Members of No. 85 (Southgate) Squadron with some of their models.

HERE are the full rules for the competition to be held on August 11th for the "Air Cadet Challenge Cup," kindly presented by the proprietors of THE AERO-MODELLER.

1. That each team shall consist of six members chosen by the Squadrons as they think fit, either by earlier competition or by general selection of the leaders.
2. The competition shall take place on August 11th, 1940.
3. All models shall take off the ground (or take off a board) under their own power.
4. Each competitor shall be allowed three flights. One misflight of less than five seconds to be allowed.
5. Flights of models to be timed from time of release to time of return to earth, or passing out of sight (as per S.M.A.E. rules).
6. The times of the three flights of each of the six members, i.e. 18 times, shall be totalled, and the team gaining the highest aggregate total shall be awarded the trophy.

Any points not dealt with by the above rules will be decided in conformity with the S.M.A.E. rules for competitions.

This is a decentralised competition, and wherever possible it is hoped that entrants' models will be timed by S.M.A.E. timekeepers. Squadron Leaders should communicate with the local S.M.A.E. club as soon as possible, so that arrangements can be made with the officials for the timing of their members' models.

The "Air Cadet" was designed by that well-known aeromodeller, Mr. C. A. Rippon, and a large plan, showing all parts in full size, together with a six-page set of instructions, may be obtained from the offices of THE AERO-MODELLER, Allen House, Newarke Street, Leicester, price 1s. 3d. post free. Three enterprising advertisers in THE AERO-MODELLER have put up a kit of parts, which may be obtained from any of them, price 14s., post free. The firms, with their addresses, are :—

Atlanta Aero Model Co., Atlanta Mills, Dixon Lane Road, Leeds 12.

Cloud (Model) Aircraft, 304 High Street, Dorking, Surrey.

Premier Aeromodel Supplies, 2a Hornsey Rise, London, N.19.

In addition to the flying contest for this model, details of which have already been announced, Mr. C. A. Rippon, of the S.M.A.E., has suggested that there should be a Construction and Finish Competition, and the suggestion has been approved. Following are the conditions :—

(1) One model from each squadron's actual flying team shall be sent in to headquarters for judging for construction and finish.

(2) The model submitted must be to the specification laid down in the April issue of THE AERO-MODELLER, i.e. "The Air Cadet," designed by C. A. Rippon for A.D.C.C. squadrons.

(3) The models shall be judged by a panel of three judges : Mr. C. A. Rippon, Mr. D. A. Russell (managing editor of THE AERO-MODELLER), and Squadron-Leader C. F. Gordon, secretary of the Air Defence Cadet Corps.

(4) Each model sent in shall be packed in a strong wooden box, carriage paid each way.

(5) The competition will take place after the flying contest for THE AERO-MODELLER Trophy, so that squadrons may clean up their models and pick their representative.

(6) Models must be sent to Air Defence Cadet Corps Headquarters, Kinnaird House, 1a Pall Mall East, London, S.W.1, by September 15th, 1940.

THE "CYGNET" — *A Beginner's Simple 'Plane*

THE "Cygnet" is a beginner's simple 'plane, being easy to build and even easier to fly if it is constructed in accordance with instructions; yet it will be a good design upon which further improvements or rather experiments may be made. Furthermore, the appearance of the model is enhanced by its simple lines and lack of unorthodox trimmings.

Fuselage.

A full-size plan should be drawn of this and the two sides built on it in the usual manner, and then being joined by the cross-members.

All longerons and struts are of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa. $\frac{1}{16}$ in. sheet balsa is cemented in the first bay for strengthening purposes, and two pieces of $\frac{1}{16}$ in. sheet balsa are also cemented in the bays indicated, and pierced to take the motor peg, which is a piece of birch dowel or split cane $\frac{1}{8}$ in. in diameter.

Main-plane.

The leading edge is of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa, and the wing is made up of $\frac{1}{32}$ in. sheet balsa ribs on two spars of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa and a $\frac{3}{32}$ in. × $\frac{1}{4}$ in. balsa trailing edge. The centre section is covered with $\frac{1}{32}$ in. sheet balsa top and bottom, and four small pins are cemented in to take the rubber bands for fixing the wing. Wing tips are made of thin reed cane bound and cemented to the leading and trailing edges. The dihedral is 1 in. at the tips.

Tail-plane.

This is of the lifting type. The elevator is built of $\frac{1}{32}$ in. sheet balsa ribs on a $\frac{1}{32}$ in. × $\frac{3}{16}$ in. spar, with a leading edge of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa and a $\frac{3}{32}$ in. × $\frac{1}{4}$ in. trailing edge. The rudder is formed by two $\frac{1}{32}$ in. sheet balsa ribs cemented to a leading and trailing edge of $\frac{3}{32}$ in. × $\frac{3}{32}$ in. balsa. The bottom of the rudder is made of a piece of $\frac{3}{32}$ in. sheet balsa, $\frac{1}{4}$ in. wide and carved to fit over the centre section of the elevator. It is secured on to the elevator by cement (after covering).

Undercarriage.

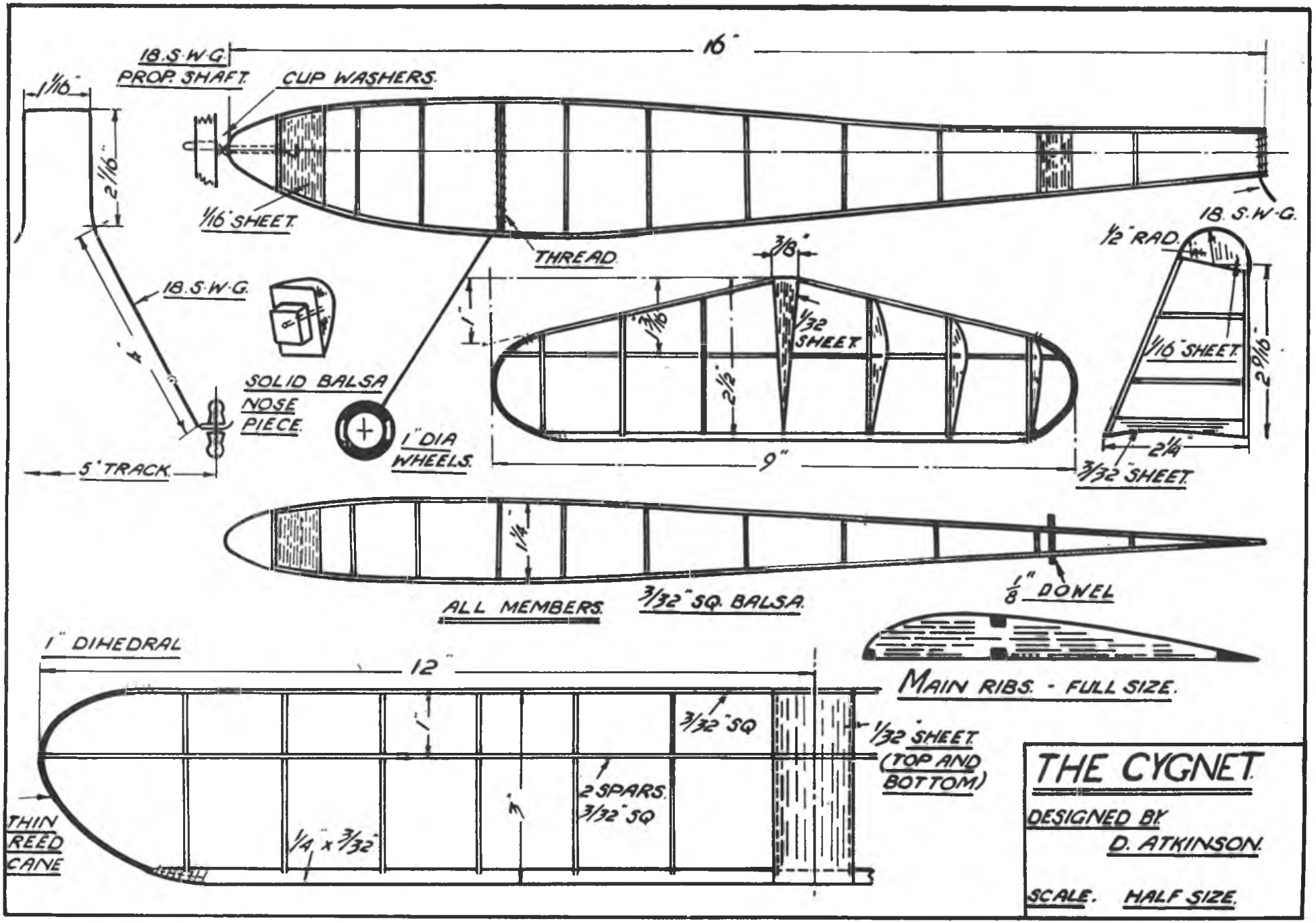
This is simply a piece of 18 s.w.g. piano wire, bent, bound and cemented to the cross-struts of the fuselage where indicated. The length of each leg is 4 in. (to centre of wheel). 1 in. diameter wheels are used.

Nose-block.

The nose-block is carved from a piece of block balsa $1\frac{1}{8}$ in. × $\frac{7}{8}$ in. × $\frac{7}{8}$ in., and is drilled to take an 18 s.w.g. brass bush. The propeller shaft is of 18 s.w.g. piano wire and an 8 in. "Paulownia" type propeller is used. A free-wheel may be fitted if so desired.

Flying.

A motor of four strands of $\frac{3}{16}$ in. flat rubber is recommended—2 in. longer than the distance between motor peg and hook, and up to 500 turns may be given in safety on a lubricated motor. The model should have a fast climb an a flat glide.



A six-foot wing span F.A.I. glider, built by Mr. R. Bowyer, of the Hornchurch M.A.C.

SOME of you chaps are more trouble to me than all my money! Following the "Gamage" Cup contest, I had a word with Mr. J. C. Smith, Competition Secretary of the S.M.A.E., who informs me that an extraordinarily large number of incorrectly compiled entry forms were received by him from various clubs, and I promised to stress one or two of the main essentials that must be complied with when making out the result sheets for your individual clubs. My remarks here, naturally, are directed mostly to the competition secretaries of the clubs, but it is up to all ordinary members and other officials to see that these requirements are carried out, as otherwise the whole club is going to suffer.

Firstly, all the details asked for *must be given*, such as name of club, ground, date, etc.

One common fault applying to the result sheets of the "Gamage" Cup were that the signatures of only two timekeepers were appended, and one of them was also shown in the list as a competitor. It is obvious, of course, what has happened, the competition secretary failed to get the signatures of some timekeepers to the sheet before they left the ground. Now, obviously, the officials cannot accept the individual entry of the competition secretary under these conditions, as, according to the list submitted, he must have timed his own flight, which, of course, is entirely out of the question. Whilst the explanation is quite simple, you must realise that it places a lot of extra work on the shoulders of the S.M.A.E. Competition Secretary, who, goodness knows, has plenty to do without having to chase up little queries which can be so easily avoided. Again, it must be pointed out that the result sheet must be used during the competition and not made up from another list afterwards. I am afraid some sheets I have seen at various times were too obviously written up when the compiler had a nicely placed desk and a comfortable chair for carrying out his duties. This is only a minor point, but rules are rules and must be adhered to.

Finally—and a very important point this—the rules state that all entries must be received not later than the first post on the Tuesday morning following the competition. Now in this year's "Gamage" Cup two clubs were two days late and one club three days late in sending in their entries, and the officials had no option but to cancel them from the list. This is very unfortunate, and a step the officials themselves were very unwilling to take, but in fairness to the large majority of clubs who abide by the rules laid down, they had no other recourse.

I would say to you club competition secretaries that you were elected to do the job, and to be late in forwarding such details, leading to the elimination of your club's entries, is rather hard on the rest of the chaps.

Actually, the three clubs in this instance made no difference to the individual winners, but you must realise that these clubs lose all score for the "Plugge" Cup in this round. So buck your ideas up. Competition lists, rules, etc., are there to be read and obeyed, and surely it is not much of a job to keep *au fait* with your particular job. Believe me, I would not like to be in the shoes of some competition secretaries at the moment.

Well, we've started the season off well, with the "Gamage" Cup event. The response exceeded my expectations, and I think of all those who might have thought that the present conditions had put the kibosh on such events. Good weather was experienced generally, though the usual high wind was in evidence in most places.

Halifax again start the season well at the head of the "Plugge" Cup list, and I am glad to see a Scottish club well up the line this time. Of course, it is too early yet to say much on the Championship aspect, but I think we shall have a wider distribution of interest this year than formerly. And there were some die-hards who decried the institution of decentralised competitions. Proof of the pudding is in the eating!

"GAMAGE" CUP RESULTS.

		Total time.	Individual Champ. Pts.
1.	Courtney, A. A. (Oxford) ...	717·4 sec.	206
2.	Peckett, D. (Halifax) ...	700·0 ,,	205
3.	Tindall, A. (Lancs)	613·5 ,,	204
4.	Houlberg, A. F. (Oxford) ...	534·75 ,,	203
5.	Murray, W. (Fife)	489·5 ,,	202
6.	Branch (Hayes)	480·0 ,,	201

(212 competitors).

"PLUGGE" CUP LIST.

Halifax	595	points
Fife	586	,,
Oxford	568	,,
Southport	564	,,
T.M.A.C.	533	,,
Ashton	529	,,
Hackney	527	,,
Lancashire	518	,,
West Sussex	513	,,
Hayes	511	,,
Thames Valley	508	,,
Luton	506	,,

(46 clubs competed).

One more item before getting down to individual reports, and that is in connection with the N.G.A. enrolment forms which are contained in this issue. Under the present circumstances it is more essential than ever that everybody flying model aeroplanes should be fully covered against any third-party claims that might arise, and, after all, 6d. a year on your modelling expenses is a mere flea-bite against the benefits derived from just filling up the little form and taking the trouble to post it with the necessary fees; so get

it done all those of you who are still among the great uninsured.

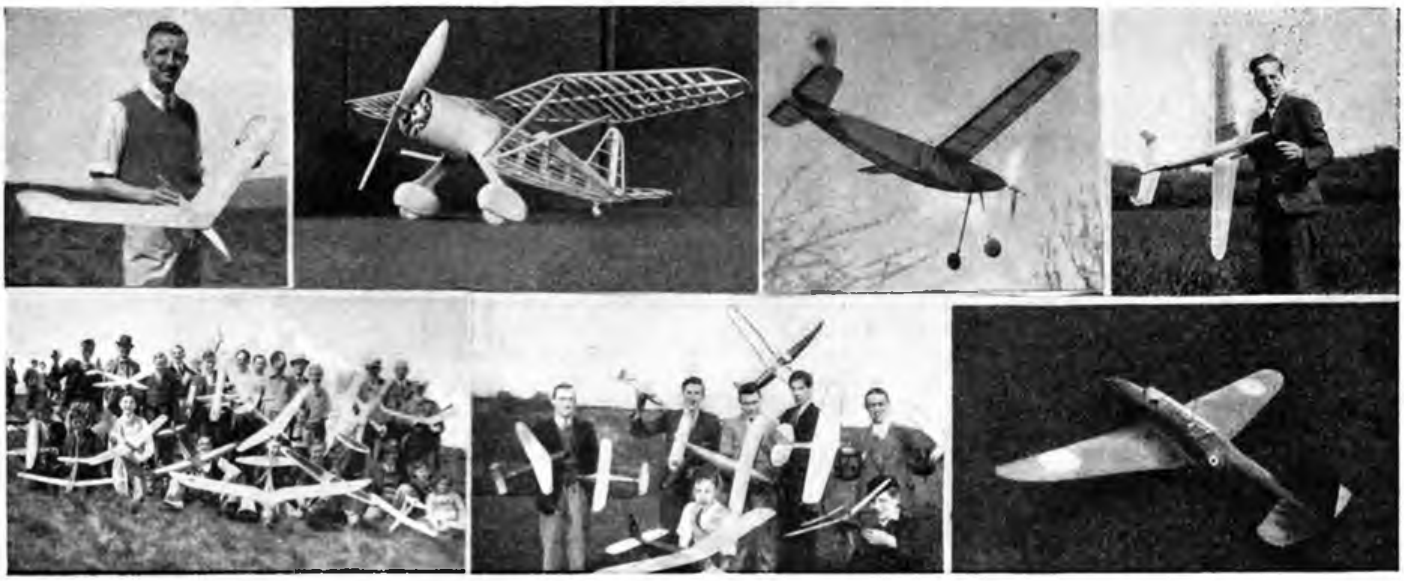
The IRISH JUNIOR AVIATION CLUB look as though they are going to be unlucky as regards English contestants for their annual meeting on July 21st. This should be a very interesting event, but I am afraid the latest restrictions on travel to Ireland look like preventing the support they may have received from the English enthusiasts. Still, better luck another time, and we wish them the best of luck.

At the special request of the BEVERLEY AND D.M.A.C. we held up space this month to include a report of their open rally, held on June 2nd. This must have been a very successful affair indeed, and was blessed with ideal weather for aero-modellers; hot sun and hardly any wind made things just perfect, and the results certainly bear out these statements. Thermals galore were in evidence, and there must have been some really hefty ones about in the Wakefield Class event, which developed into a first-class struggle between Len Stott, of Halifax, and Dickey Skinner, of Beverley. These two people were running level until the last flights, and then the fun started. Stott's machine took off, and, flying in tight circles, grabbed altitude at a terrific rate, and it was evident that it had hooked on to a very strong thermal; the model eventually disappeared into a cloud, after being timed for 15 min. 19 sec. Meanwhile Skinner released his model, and it was soon chasing Stott's into the blue. However, luckily or unluckily, whichever way you care to take it, he did not get quite the same altitude as Stott, but his machine kept in sight for a time of 31 min. 31 sec., only two minutes short of Bob Copland's previous world record. (This, of course, creates a new record for the British Isles.) A gliding event was followed by an over 30 in. wing span contest, which Skinner again pulled off, one flight alone being 8 min. 30 sec. Gray and Ellwell lost their models after flights of 5 min. and 3 min. 58 sec. respectively. Other models were lost in the under 30 in. span competition, while earlier in the day T. Edwards raised the club catapult-launch glider record to 3 min. 15 sec.

Final results were:

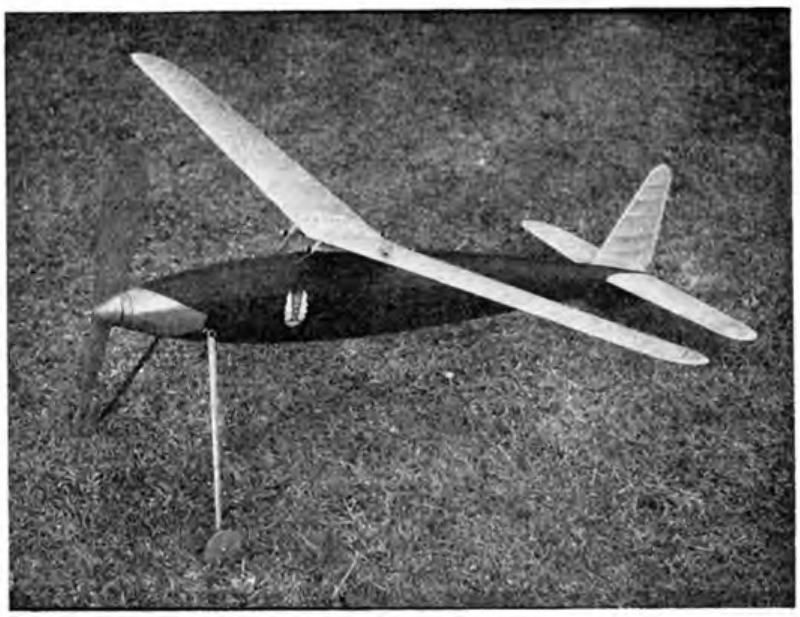
WAKEFIELD CLASS.	R.O.G.	
1. R. Skinner (B.M.A.C.)	...	2,198·0 sec.
2. L. Stott (H.M.A.C.)	...	1,280·0 ,,
UNDER 30 IN. SPAN.	H.L.	
1. D. Holdsworth (B.M.A.C.)	...	380·0 sec.
2. E. Constable (B.M.A.C.)	...	309·0 ,,
OVER 30 IN. SPAN.	H.L.	
1. R. Skinner (B.M.A.C.)	...	727·5 sec.
2. R. Gray (B.M.A.C.) ...	...	416·0 ,,
GLIDERS. (Peg launched 100 ft. line).		Av. of three.
1. R. T. Ragg ...	...	37·0 sec.
2. R. T. Ragg ...	...	36·6 ,,

C. Lot, of READING AND D.M.A.C., won a recent contest, his machine employing a single-bladed folding propeller, blade width of 3 in. I am told this article actually folded without either breaking the fuselage or falling off!



1. *R. F. L. Gosling with his tailless glider that recently broke the record with a flight of 52 seconds.*
2. *How's this for a first attempt at aero-modelling? Congratulations to K. N. Yeldham, of Hawkhurst.*
3. *Model by P. S. Hedgehurst, of the Speldhurst club.*
4. *Mr. B. C. Sparkes, of the Reading Club, with a Wakefield model.*
5. *Bradford club members don't seem to mind if it snows!*
6. *Group of Batley and D.M.A.C. members and models.*
7. *A 54 in. span "Fairey Battle," built by J. Ansell, of Wolverton.*

The CLYDE MODEL DOCKYARD TROPHY for Scotland Competition will take place this year on July 7th, and, owing to difficulties attendant on travelling facilities, it will be a decentralised event, in three areas—Glasgow, Edinburgh and Dundee. Intending competitors can fly at their most suitable ground, and full particulars can be obtained from the following: For Glasgow—J. M. Tennant, 17 Park Drive, Rutherglen. Edinburgh—L. Middleton, 18 Craigmont Gardens, Edinburgh. Dundee—W. N. Gild, 18 Kenilworth Avenue, Tey Bank, Dundee. Unfortunately we were not able to give earlier publicity to this, but I hope all you Scottish enthusiasts will turn up and give the organisers real support for the work they have put into this meeting.



A " Flying Minutes," built by Mr. A. F. Houlberg, of the Oxford Club. Holder of the club record with a time of 7 min. 5 sec.

I see that the FIFE CLUB have already shown their mettle in the " Gamage " Cup event, and what one Scottish club has done I am certain the rest of you can do.

I have a letter this month from a chappie at SINGAPORE who would be glad of pen pals amongst fellow aero-modellers. Anybody who would care to write should address to: S. C. Kwa, 186 Pasier Panjang Road, Singapore.

Mr. W. Preston, of BARNES AND D.M.A.S., had a bit of bad luck when his new specification model, on its first flight, caught a riser and said good-bye after 7 min. 27 sec. Unfortunately, Mr. Preston had not put his name and address on it, so it looks as though it's good-bye for ever! This club complains that many unattached modellers are using the flying ground in Richmond Park, which, of course, is not objected to, but what is annoying is the amount of litter these people leave about, and the fact that they trespass on parts of the park where model flying is not allowed. I have had to complain about this sort of thing before, and would be pleased if any of these people who make use of other clubs' grounds would just co-operate in keeping the thing eligible for everybody.

Mr. A. Smith, of HARROW M.A.C., won a gliding event with an average time of 61·6 sec., while Mr. H. Hills averaged 71·6 with a rubber-driven model to win a recent competition held in this club. Mr. Joe Young made an R.O.G. light-weight record of 7 min. 38 sec., out of sight, his model being equipped with a single-bladed folding propeller. It is surprising how many people are now using this type of propeller, and I think I shall really have to make one myself and see if I can get more than 15 sec. out of my 10 ft. " Never-Was." Messrs. Young and Gent both lost their models in the " Gamage " Cup event, the latter chap putting up the best time in the club, and collecting the " David Goldhill " Cup in consequence.

The model lost by D. Andrew, of the SHEFFIELD AIR LEAGUE SOCIETY (mentioned in a previous issue of Club News) has been recovered from the top of a works about eight miles away. Records seem to be quite the thing in this club, as Peter Hobbs made a flight of 9 min. 10 sec. to break the club record. Actually, a chap who was on the road at the time was able to keep this model in sight for 17 min.

Club records certainly seem to have been all the rage at the moment, which, of course, is accounted for by the exceptional weather we have been enjoying recently. Mr. C. H. Taylor, of BUSHEY PARK M.F.A.C., put up a time of 8 min. 57 sec. out of sight, but the model was followed for 48 min. and then lost in the clouds.

BLACKHEATH M.F.C. chaps have been consistently losing models and breaking records, and I understand they are having some difficulty owing to Blackheath having been well and truly " dug for victory." Messrs. Hinckley and Farnham are experimenting with an idea for paper fuselages owing to the shortage of balsa. I consider this a real national service!

Messrs. Parker, Kirkheed, and Bingham, of the ULSTER M.A.C., have won free entries and expenses for the " Gutteridge " Trophy by placing top three in a Wakfield rules event. Bingham and A. Taylor have been fighting a duel with gliders for some time now, the former raising the previous record of 67 sec. to 99 sec. at 9 p.m. Taylor walloped him three-quarters of an hour later by putting up a time of 3 min. 25 sec. Now who says that thermals only abound at lunch-time; but anyway, who'd think of contacting a riser at 9.45 in the evening?

The NOTTINGHAM D.M.A.C. held a glider event as their first contest for the year, using a winch launch of 150 ft. of line. J. Stanley won the event with an average time of 28·4 sec., following this, after the contest had finished, with a time of 4 min. 27 sec.

(Left) Not bad for a third model, eh! A one-inch scale model " Lysander," built by H. L. Welsh, of Clapton.
(Middle) Need you ask? Halifaxites " smile for the birdie."
(Right) A free-lance design built by H. J. Buddle, of Walthamstow, of 24 in. span. This model is a solid model, with all controls working, the whole model being covered with small aluminium sheets. A really nice spot of work.

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A high-wing cabin petrol-engined Monoplane suitable for most types of engine of from 9 c.c. to 14 c.c. Two large drawings.

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(By Dr. Ing. F. Piatelli)

Clever reproduction of the well-known English Sailplane. Drawing 40" × 27"

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(By K. L. Stothers)

All balsa, mid-wing Glider, holder of club records. (Wing in two halves for easy transport.)

Span, 5' Price 1/3 post free.

The "WESTLAND LYSANDER"

(By Howard Boys)

A finely designed, large flying scale model of one of the most popular types in this class of model. Drawing 41" × 40"

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The "AIRSPEED ENVOY"

(By H. J. Towner)

A beautiful flying replica of the twin-engined low-wing Monoplane, designed by a recognised expert in this class, and containing many interesting features. Drawing 40" × 29"

Span, 52" Price 3/6 post free.

The "MILES KESTREL"

(By H. J. Towner)

A triple-geared replica of the popular low-wing Monoplane, this is one of the finest flying scale models yet built. Drawing 40" × 27"

Span, 39" Price 3/6 post free.

** The "COPLAND'S WAKEFIELD MODEL"

(By R. Copland, world record holder)

Bob Copland, long famed for his designs and flying of the high class contest type of model, has designed this machine on the latest aeronautical practice. Of super streamline, shoulder wing category, this model embodies the best ideas yet produced. Span, 44" Price 1/3 post free.

**The "De H. MOTH MINOR"

(By G. W. Day)

A simply constructed replica of the new De Havilland training machine. Strong yet light construction makes a useful flying model, with an average performance of 45 seconds. Drawing 30" × 22" Span, 35" Price 2/- post free.

* THE ** "SUPERMARINE SPITFIRE"

An all balsa miniature of the well-known British Fighter 'plane. Flights of from 30 to 35 seconds.

Span, 15" Price 1/3 post free.

* THE **"MESSERSCHMITT M.E.109"

Flying scale model of the much publicised German Fighter machine. Drawing 30" × 22"

Span, 19½" Price 1/3 post free.

*** "The "HEINKEL He 112"

Another German Fighter type model, featuring detachable wings. Average performance 35 secs. Drawing 23" × 18" Span, 18½" Price 1/3 post free.

"VIPER II"

(By C. Rupert Moore)

A well-designed semi-scale model, containing many practical and unusual features, combined with a high flight performance. Two drawings

36" × 30" Span, 48" Price 6/- post free.

** The "AIR CADET"

(By C. A. Rippon)

An advanced design, yet suitable for the beginner in aero-modelling, this model has proved exceptionally successful, and possessed of super performance abilities. Strong enough for all purposes, yet with the duration of a streamliner.

Span, 38" Price 1/3 post free.

** "TOOTS II"

(By R. A. Cherry)

Cabin type, high-wing Monoplane of semi-scale appearance. Winner o many contests, and has made many flights of over two minutes.

Span, 26" Price 2/- post free.

The "1940 GAMAGE CUP WINNER"

(By A. F. Houlberg, A.M.I.Ae.E.)

Winner of the first main competition of the 1940 season, with a total time for three flights of 717.4 seconds. Consistency, coupled with sound design by a well-known aero-modeller, makes this an asset to any collection of contest models. Drawing 30" × 40". Span, 44" Price 3/6 post free.

**The "SPARROWHAWK"

(By J. Van Hattum, A.F.R.Ae.S.)

A good design for the beginner, this model is designed by a well-known Dutch aero-modeller, famed for his many successful designs and instructive writings on aero-modelling.

Span, 30" Price 1/3 post free.

The "PTERODACTYL"

(By S. E. Capps)

An unusual type of model for those who like something out of the ordinary.

Span, 60" Price 2/- post free.

The "J.B.3"

(By J. Bezemer)

A high-wing cabin type Monoplane suitable for the beginner.

Span, 36" Price 2/- post free.

"A BABY R.O.G. MICROFILM INDOOR MODEL"

(By J. S. Isenberg, Canada)

Can be flown in an ordinary lounge or small hall, for flights of two minutes and longer.

Span, 13" Price 1/6 post free.

The "FIREFLY"

(Canadian Stick Model Record Holder)

(By F. J. Rogerson)

A high performance "Class C" model, with stick type fuselage. Holder of the Canadian record with a time of 20 min. 26 sec. (Unofficially timed 28 min. 13 sec.) Simple construction with super performance.

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(Note : All items marked * include a copy of "The Aero-Modeller," containing a full description of models. Items marked ** complete with fully-detailed building instructions.)

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(All previous lists cancelled). ***(Dealers write for trade terms).***

1. *J. Packs, of the Harborough Club, demonstrates a hand launch.*
2. *Nice spot of modelling by H. J. R. Pope, of Hampstead. Model is a 21 ft. span Gloster Gauntlet.*
3. *An interesting Twin Fuselage Wakefield model, built by W. Harrow, of the Peterborough Club.*
4. *Mr. Maxwell, of the Glasgow M.A.C., poses nicely while his model buzzes off for a date with the fairies!*
5. *How's this for a nice job executed under difficulties? C. Bonsor, of Bradford, built this model while lying in bed—and this is only one of many similar machines built under the same circumstances.*
6. *A 2¼ oz. "Spitfire," built by A. J. Groom, of the Luton and D.M.A.C.*
7. *A 36 in. span "Brown B.3 Racer," constructed by Mr. Proven, of the Lancashire M.A.S. Average duration is 40 seconds.*

The OXFORD M.F.C. seem to have taken on a lease of new enthusiasm, and their successes in the recent "Gamage" Cup event have well paid their efforts. Mr. Houlberg, chairman of the S.M.A.E., has raised the club record to 7 min. 6 sec. with a "Flying Minutes," and high durations are pretty general now. It was with a Houlberg designed model that Courtney won the "Gamage" Cup.

BRADFORD M.A.C. have been very active throughout the winter months, and many new models were on show at the first meeting of the year. The "Cripps" Cup for H.L. gliding was won by E. Beanland with a time of 78·8 sec. average, followed by G. A. Adcock, 56·4 sec., and T. M. Hart, 51 sec. R. F. L. Gosling won a knock-out competition with his tailless glider, with which he holds the British tailless H.L. glider record with a time of 52 sec. A mass-launched glider event was won by K. Race, whose machine clocked over 2 min. from a H.L. (Photo of Gosling and his record-holding glider printed elsewhere).

Just across the way from the Bradford boys, the HALIFAX M.A.C. have again been up to their tricks. (You will note they are off to a good start again in the "Plugge" Cup). Their spring contest was won by Len Stott with a total for two flights of 762·5 sec., followed by N. Lees with 655·5 sec., and H. Hirst, 216·5 sec. Lees lost his machine on his last flight! D. Peckett, who placed second on the "Gamage" Cup, made a best time of 5 min. 57·5 sec. and totalled 700 sec. (And to think I have been trying for years to get a minute! I must be using garter elastic).

I am told that a meeting of the North-Eastern Area was held recently, and many items of interest discussed and adopted. Other clubs wishing to associate themselves should get in touch with the secretary, Mr. L. Stott, 146 Spring Hall Lane, Halifax.

M. H. G. MacLucas, of the WESTON-SUPER-MARE M.A.C., put up their best time in the "Gamage" Cup, his time being 147·2 sec., while S. Voules leads in the "Voules" Trophy with 115·1 points. I understand he has a 4 ft. span "Taylor Cub," and look forward to hearing of performance details. (Incidentally, our Editor asks if anyone can give the address of Messrs. H. E. Barnes and A. Daventry, of this district, as he wishes to reply to a letter they sent—but gave no address! Gercher!).

High spot of the month from the WEST SUSSEX M.A.S. is the raising of the club H.L. record to 26 min. 45·6 sec.—just following a new figure of 11 min. 32·5 sec. by F. Gates. R. Warring is the present holder, and he again topped the club list in the "Gamage" event with a time of 110 sec. average. Two ladies showed the chaps up, Miss Culbridge averaging 89 sec. and Miss Offord averaging 86 sec.—the letter setting up a new ladies' record of 89.4 sec.

"Chuck" gliders have found supporters among the boys of the EDGWARE M.A.C., J. Wallis having set a time of 80 sec. I presume they use the solid balsa types seen in American papers. Mr. Carling won a competition with an average time of 170 sec., followed by Mr. Hiles, 160 sec. Membership is steadily increasing.

Winners of the first competition of the year in the SOUTHPORT AND D.M.A.C. were Messrs. Catterick, 226·5 sec., Halsall 216·5 sec., and Ashcroft 209·3 sec. Mr. Hart put up the best club time in the "Gamage" with a total of 427·25 sec., with Halsall, 404·5 sec., and Crusham, 263 sec., backing him up. Two new club records were set up in this event. Southport were placed fourth in the "Plugge" Cup list.

Copland has been trying to better his British record at the Albert Hall recently, and has been twice around the 15 minute mark, with Yellowly near with 12½ minutes. Mr. Bell won the "Old Timers" event with an aggregate of 284·2 sec.—and also made the best flight of the month, together with S. Collins, their machines disappearing into the blue after about 9 minutes.

"Despite my remarks," the PORTSMOUTH AND D.M.A.S. have sent in another report this month. Thenks! All pals again now? Mr. R. Harris won a recent "free for all" event with a time of 4 min. 2·5 sec., thus winning a handsome silver cup. A. Gadd was second and Mr. Carroll third. Mr. Day has since raised the club record to

2 minutes. (By the way, Portsmouth, I miss the point of the " new record." Let's hear more from you—I hate being in the dark).

An enjoyable inter-club meeting was held by the WIRRAL M.A.S. and the Mersey M.F.C., the former winning with a total score of 766·9 points against the Mersey 463·1. Mr. B. Thomas put up the best time of the day with 104 sec. A new club-house has been obtained at the river end of St. Paul's Road, Birkenhead, and any prospective members are welcome there on Friday evenings from 7.30 p.m.

We don't hear much about weight-lifting competitions these days, but the WARWICKSHIRE M.A.C. tried it out recently, when models had to carry 50 per cent of the unladen weight of the model. Mr. Wilson won with a time of 32·3 sec., which I claim is pretty good going. Mr. Sharp won a nominated time event with an error of only ·2 sec. Close enough?

Harrowing tales of the " Damage " Cup come from the CHEAM M.A.C.—and elsewhere, of course!—where P. Kelsey made the best time of 315·5 sec. Entertaining the Stoneleigh Club, the Cheam boys were victorious by 35 points to 20. Notable record is the new R.O.G. light-weight by F. Briggs, of 3 min. 47·5 sec. (Yes—I do mean his model, you mugs!)

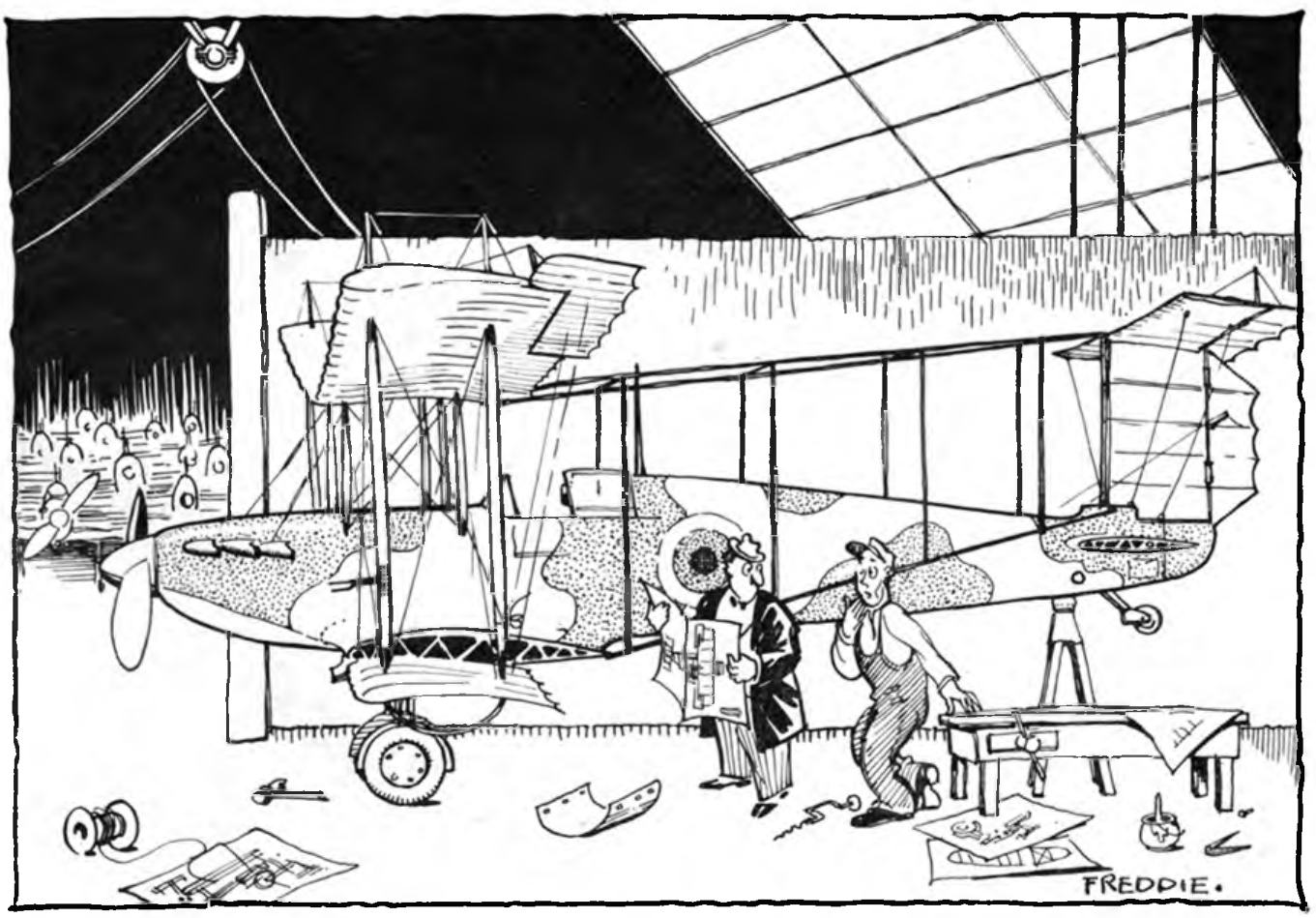
Messrs. Mawby and Gilbert, of the EALING AND D.M.F.C., now hold five British indoor records between them (see list in S.M.A.E. report), and it just shows you it can be done by a little application to things.

G. Bedford won the " nearest to 210 sec." event of the BATLEY AND D.M.A.C. with a total of 212·6 sec., which is getting near the mark, I'm thinking—and F. Burnell won the " under 100 sq. in. " class with a time of 147·8 sec. The spell of fine weather has brought about many fine flights, the best being by Hinchcliffe, with a time of 10 min. 49·1 sec.

The SALISBURY AND D.M.E.S. wish to make it known that their club-room at the rear of the " Engineers' Arms Hotel," South Western Street, is open to all who may happen to be stationed in the district. Good work, chaps. K. Scamell now holds the H.L. biplane figure for the club with 77 sec., while J. Lailey raised the R.O.G. figure to 3 min. 7 sec.

Another inter-club meeting staged by the SPELDHURST (Kent) M.A.C. was highly successful, and was won by Speldhurst with an average time of 75 sec., Anderida following with 64 sec. C. W. Quinnel won the Wifield Class with a time of 42·5 sec., and A. Turley the H.L. affair with a 150 second average.

LEEDS M.F.C. have now obtained use of a 58-acre field, which, though a bit out in the wilds, is much better for petrol models, which are well patronised by the members. A fine trophy has been presented to the club by Capt. Anderton, M.C., and an ambitious programme winds up with a " free beer and sandwiches " affair—which all sounds very sweet and tasty to yours truly. The club record now stands to the credit of the competition secretary with a time of 3 min. 55 sec.



ARE YOU *SURE* THAT YOU ARE WORKING TO THE RIGHT PLANS?

Exhibition staged by the Market Harborough club. Note D. A. Russell's monster "Lysander" to right rear.

The GLASGOW M.A.C., which obtained permission to fly decentralised events on Saturdays, owing to religious opposition, etc., in their district against Sunday flying, clicked for the same conditions as the Sunday fliers in the " Gamage " event, e.g. hot and windy. J. Maxwell made the best time with a total of 285 sec., raising the club record to 127 sec. W. Annaud won the first competition of the year with a time of 92·6 sec. average.

H. Quinn won the R.O.G. event of the PETERBOROUGH M.A.C. with an aggregate of 232·5 sec., S. Venn following with the time of 199 sec. The latter clocked 5 min. 50 sec. with a slab-sider Wakefield recently.

I hear that E. W. Evans, of the NORTHAMPTON M.A.C., has an 8 ft. glider under construction—and I await news of this job from the bench of an expert. A. Goodman lost his six-footer in a thermal, and had it returned from over 10 miles away. Naice huntin', Sir!

Talk about flying—listen to the ILFORD AERO-MODELLERS' list. 5 min. 26 sec. o.o.s. by D. Elmes. T. Heckles's sailplane did 6 min. 46 sec. (new record), Smee does 30 min. with a heavy-weight—another new record, and F. Smith lost his heavy-weight after 11 min. 16 sec. Whew!

K. Howland, of the WESTLAND (Essex) M.A.C. won a competition with a time of 4 min. 26·6 sec. aggregate, and holds the club record with the time of 131 sec.

J. E. Eifflander, winning a competition with his glider time of 2 min. 3 sec., interest has boosted in this type in the MACCLESFIELD M.A.S. Mr. Turner says he has found a good deal of fascination in these models, " once it leaves the tow-line at a good height, but if the glider circles nicely it will not tow, and if it will tow it won't circle. So what!" All I can advise is—try an automatic rudder, and see how that does the trick.

Don't know what all you Clubites will say, but I am asked by R. Gosney, of 142 Guildford Road, Portsmouth, to ask all " lone wolves " to contact him to join " The Condors." " In this way persons who may not wish to join an ordinary aero club, and thus maintain complete independence," may exchange ideas, etc. Well, well. In spite of having no use for the club movement, I am asked to treat this as a club matter so that those interested may get in touch with the " controlling body " in Portsmouth. I leave this for your own comments!

I have news from the HORNCHURCH M.A.C. of the doings of Mr. Bowyer, whose glider forms the heading photo

to the columns this month. This job shows fine workmanship, and I am told its first trials produced flights of over 1½ minutes in poor weather. Since then he has secured the club record with a flight of 7 min. 33 sec., following with an unofficial flip of 8 min. 13 sec. Great hopes are laid on this chap, as he has secured flights of over 7 minutes with his Wakefield model—so look out for some new names when the " high spot " is run again.

THE CLUBMAN.

S.M.A.E. REPORT.—*Continued from page* 446.

D. Gilbert. Indoor fuselage hand-launched, 4 min. 55 sec.
R. W. M. Mackenzie. Indoor stick tractor R.O.G., 8 min. 48·2 sec.
L. B. Mawby. Indoor biplane hand-launched, 1 min. 37·4 sec.
L. B. Mawby. Indoor biplane R.O.G., 57·1 sec.
D. Gilbert. Indoor fuselage R.O.G., 4 min. 33 sec.
D. Gilbert. Indoor fuselage hand-launched, 6 min. 44 sec.
L. B. Mawby. Indoor rotorplane R.O.G., 33·2 sec.
R. F. L. Gosling. Tail-less glider outdoor hand-launched, 52 sec.

The meeting closed at 7 p.m. with a vote of thanks to the chair.

H. YORK, *Hon. Press Secretary*.

SOLUTIONS TO THE QUESTIONS ASKED ON PAGE 438.

Give yourself five points for each correct answer.

1. (*b*).
2. (*c*).
3. (*b*).
4. (*a*).
5. (*c*).
6. (*a*).
7. (*a*).
8. (*c*).
9. (*b*).
10. (*b*).

ANALYSIS.

40-50. Excellent.
30-40. Fair.
0-30. *Try flying* models!

Small Traders' Announcements

The charge for these insertions is 5/- each prepaid for a minimum of 30 words, extra words charged at rate of 2d. per word.

BLACKPOOL.—The Sports Shop, Palladium Buildings, Waterloo Road. All Model Supplies. Joy, Studiette, Cloud, 'Drome, Kits, Balsa, Cements, Dopes; Grand Flying Scale kits at 1s. 6d., including postage. Latest models, solids, durations. Remember "The Sports Shop."

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Appendix - Links to the plans

An 8ft span high wing petrol plane by D.A. Russell
Construction details.
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Henschel SR by D. March
Rubber scale. Construction details. Free plan union page added.
https://www.hippocketaeronautics.com/hpa_plans/det ...
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The Cygnet by D. Atkinson
A beginners 'simple' rubber model. Half scale plan
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