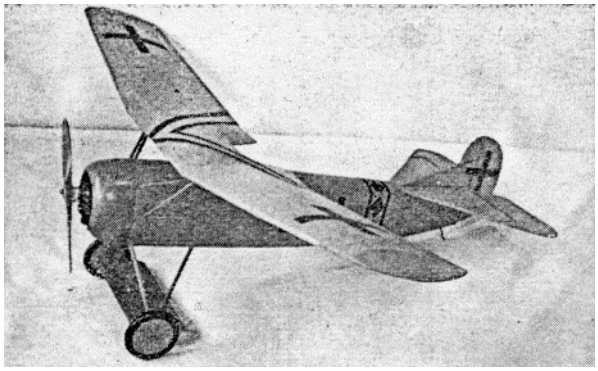
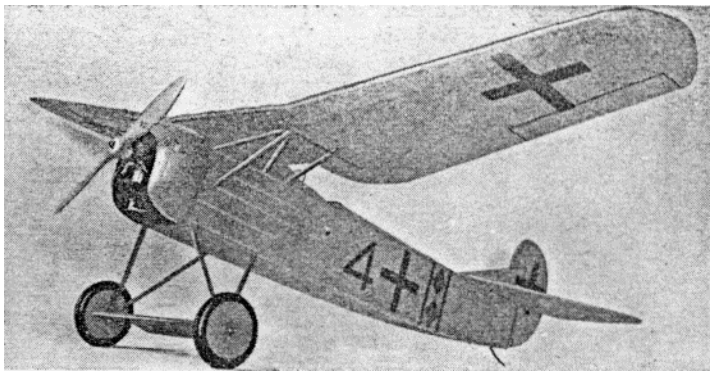


It is of contest type, though a scale model



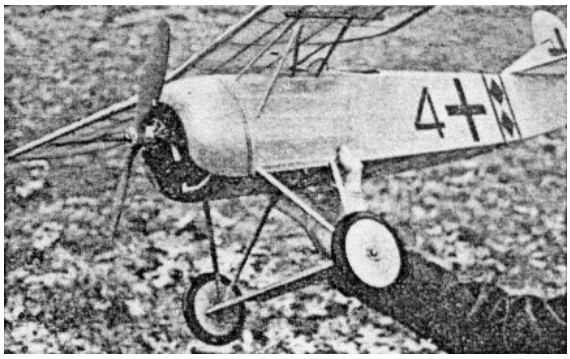
A perfect high-performing miniature of the full-scale plane

FOKKER D-8 Flies Again

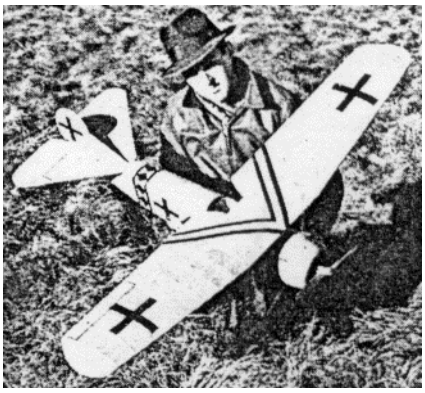
A Realistic Gas Model of a Famous World War Fighter That Performs Like a Contest Plane-

By EARL STAHL
PART 1

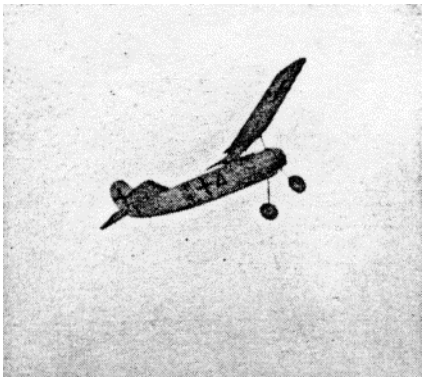
MAN June 1941



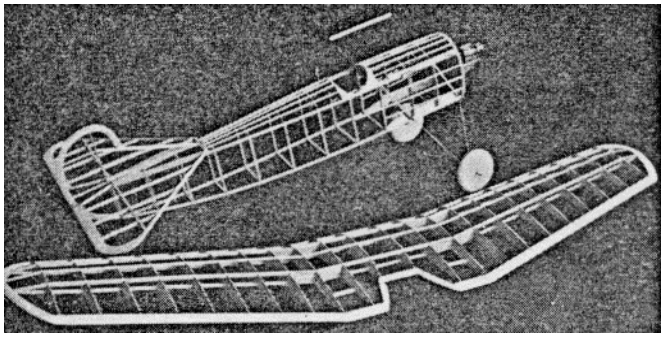
The engine is neatly cowled



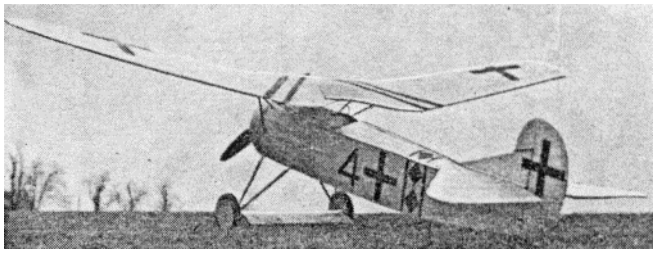
The author with completed model, ready for a flight



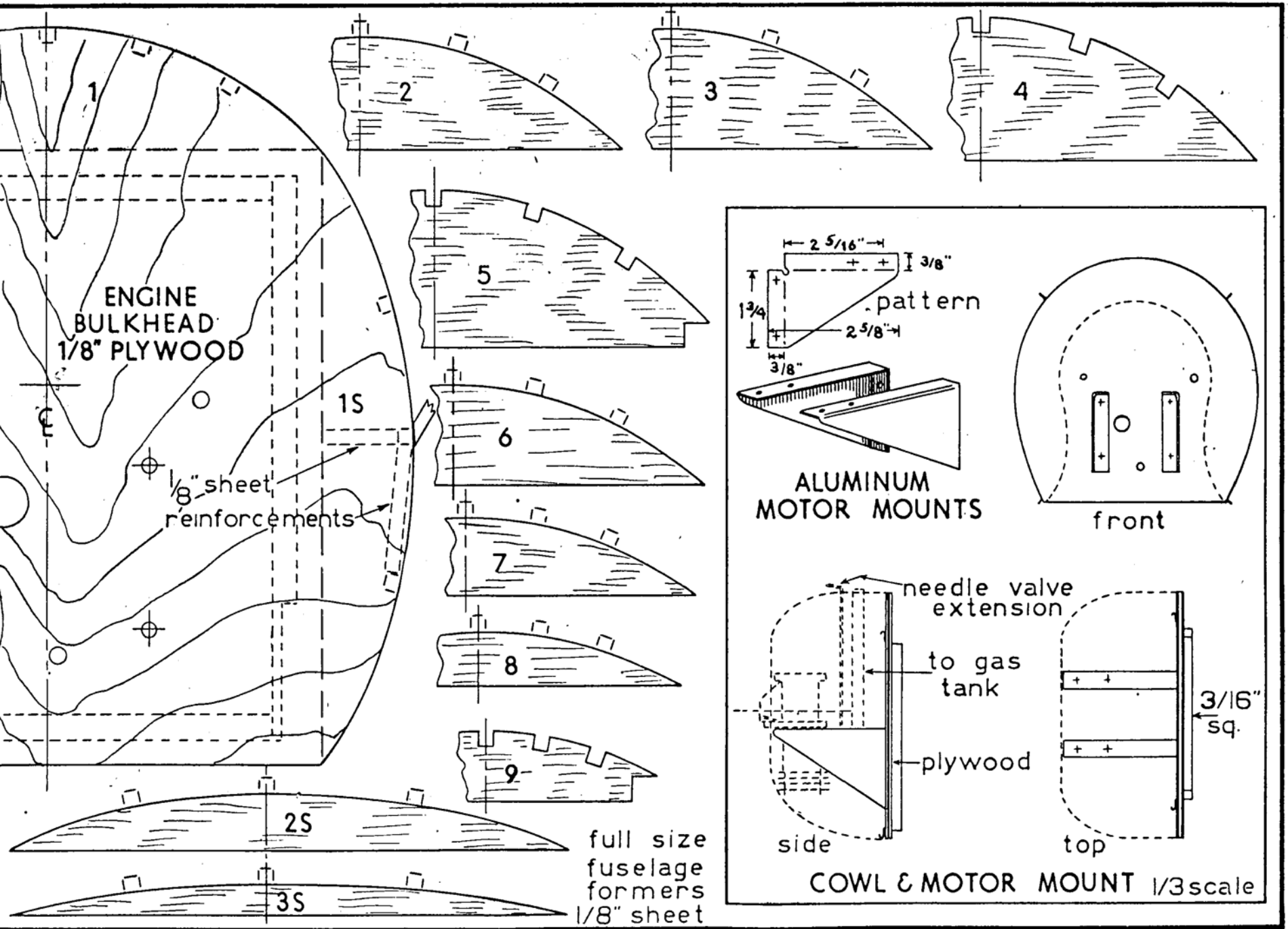
The climb is fast and steep

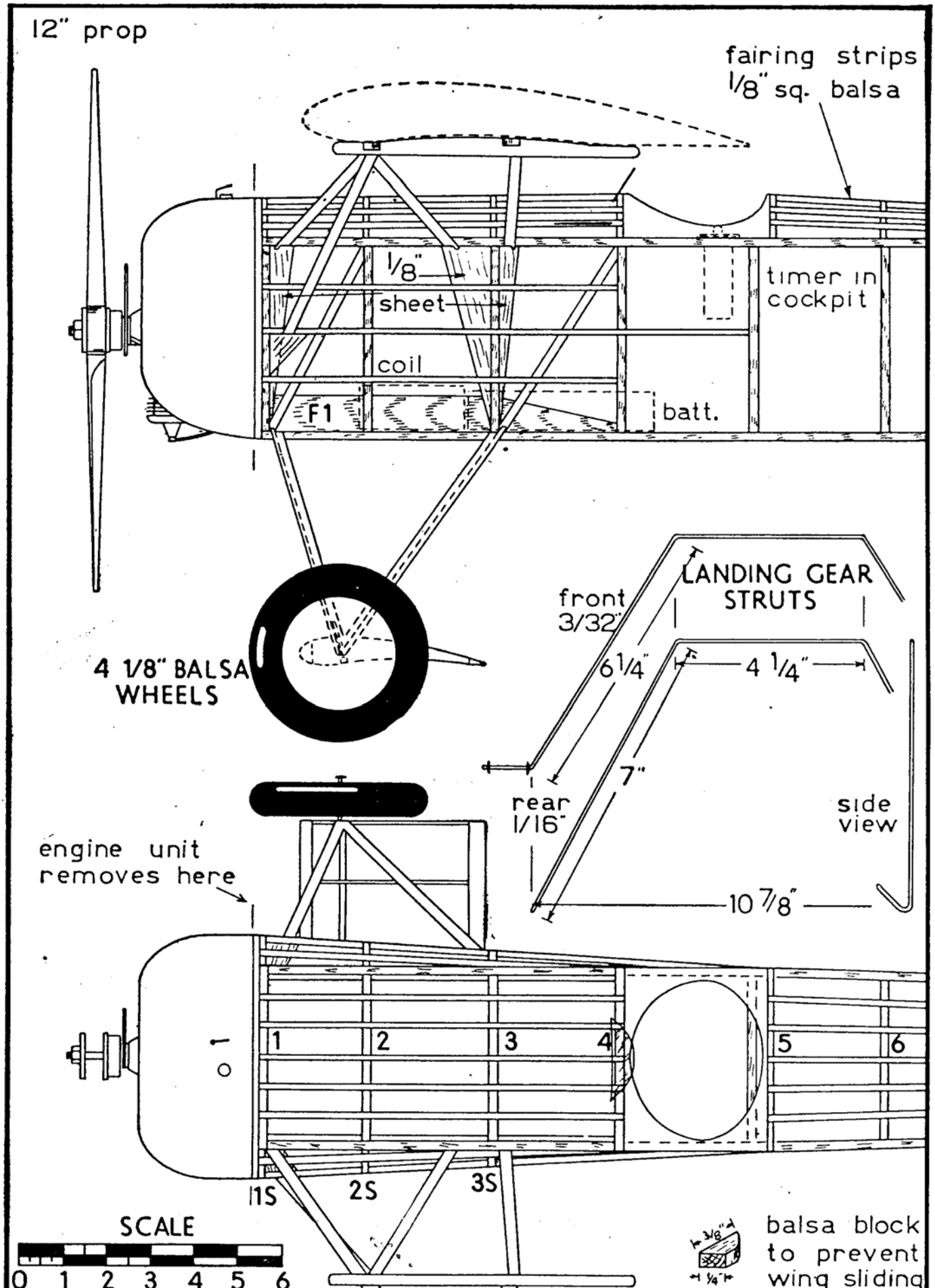


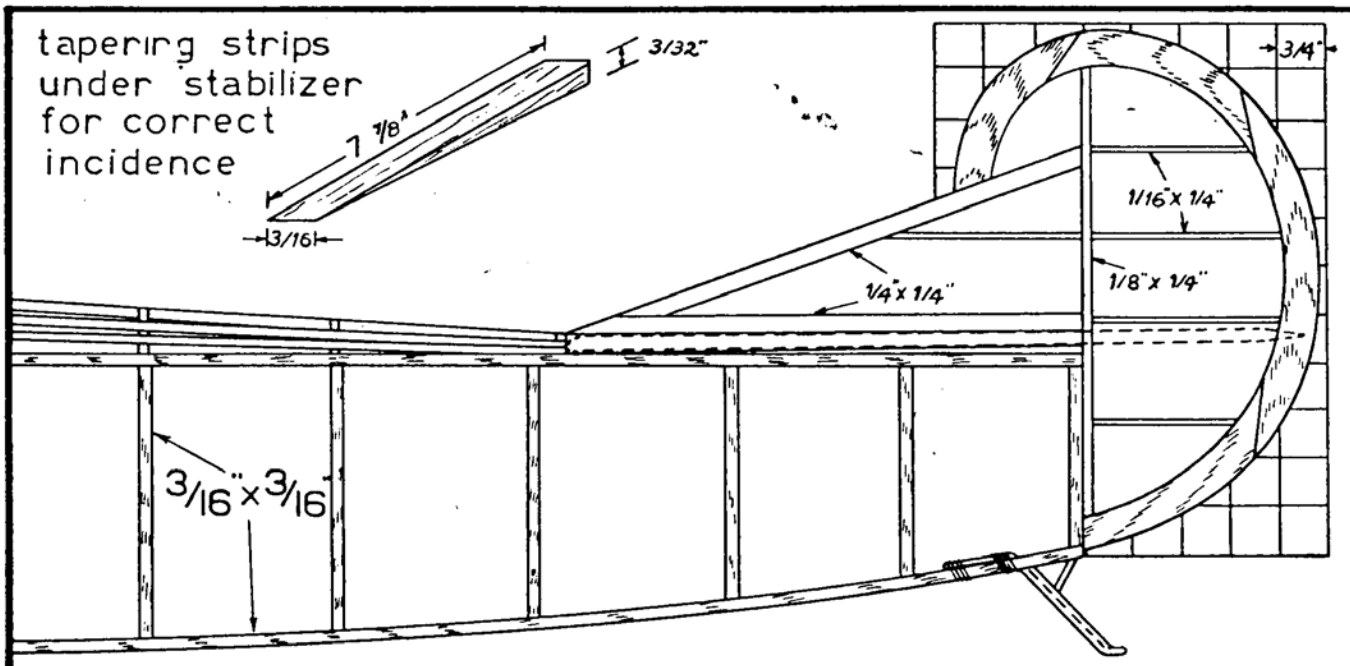
The uncovered framework shows strength and simplicity

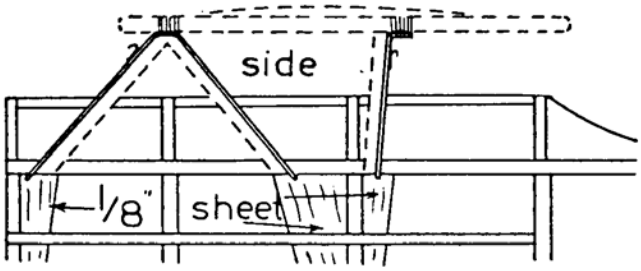


Carefully detailed, it closely resembles the full-scale plane

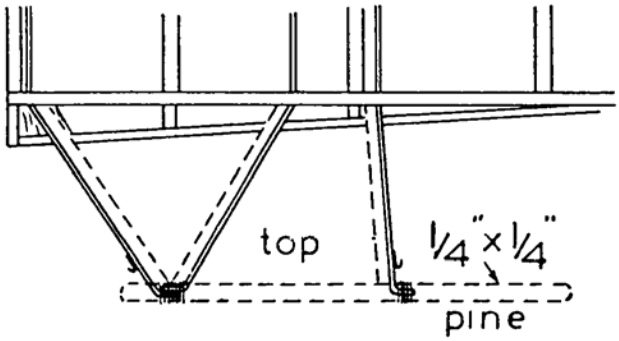

1
2
3
4
5
6
7
8
9
1S
2S
3S
ENGINE
BULKHEAD
1/8" PLYWOOD
1/8" sheet
reinforcements
full size
fuselage
formers
1/8" sheet
2 5/16"
3/8"
pattern
1 3/4
2 5/8"
3/8"
ALUMINUM
MOTOR MOUNTS
front
needle valve
extension
to gas
tank
plywood
3/16"
sq.
side
top
COWL & MOTOR MOUNT 1/3 scale

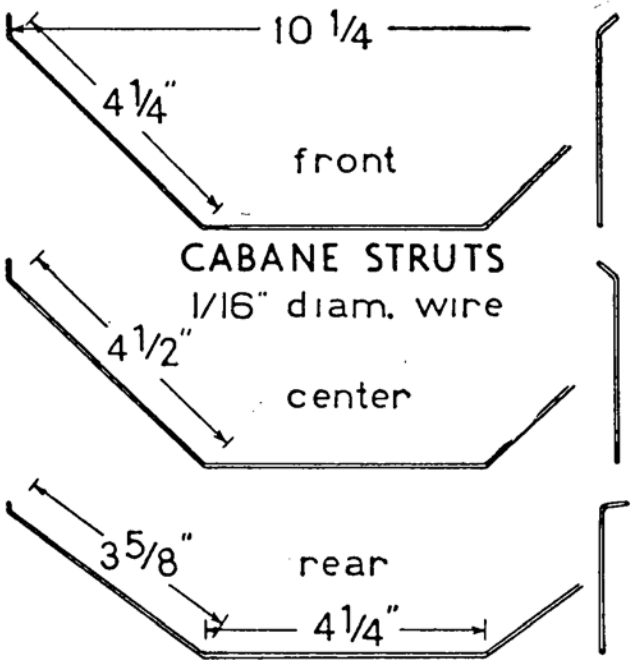

12" prop
fairing strips 1/8" sq. balsa
1/8" sheet
coil
F1
batt.
timer in cockpit
4 1/8" BALSA WHEELS
LANDING GEAR STRUTS
front 3/32"
6 1/4"
4 1/4"
7"
rear 1/16"
side view
10 7/8"
engine unit removes here
1
2
3
4
5
6
1S
2S
3S
SCALE
0 1 2 3 4 5 6
balsa block to prevent wing sliding



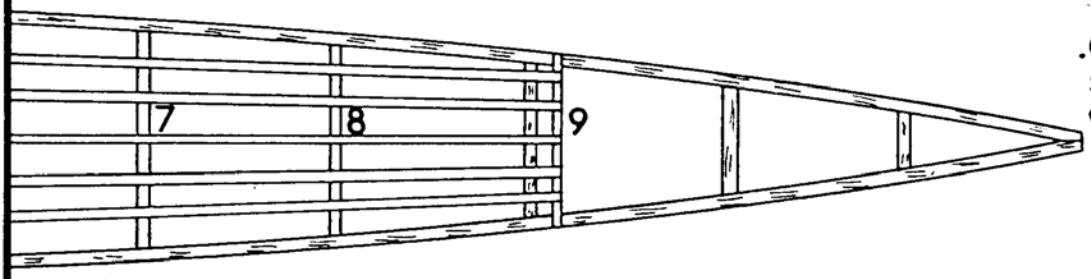


CABANE DETAIL

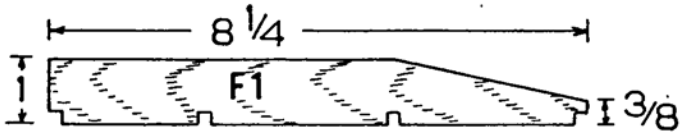




CABANE STRUTS
1/16" diam. wire

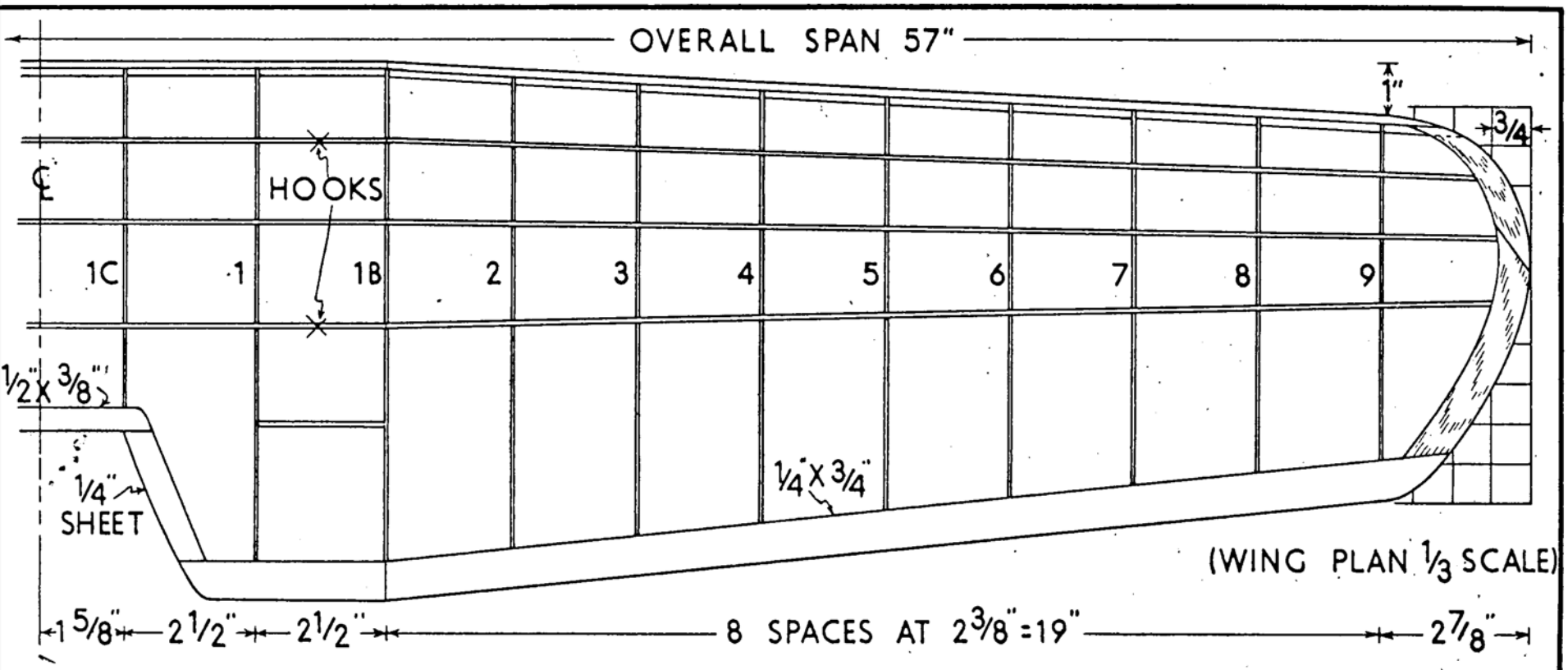


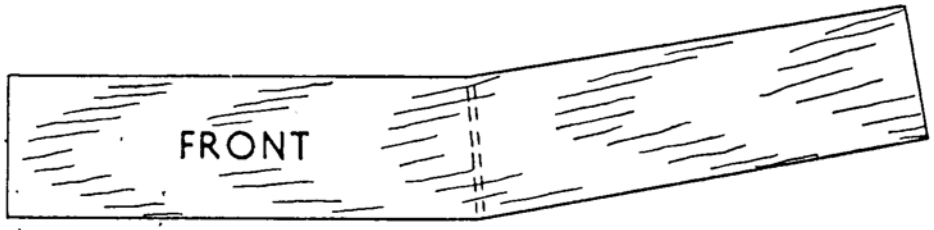
.040 wire hook soldered to cabane
4 req'd



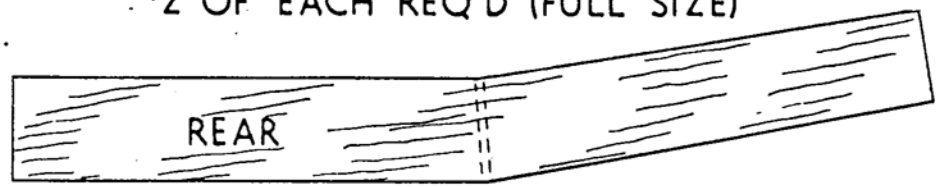
1/8" sheet 2 req'd

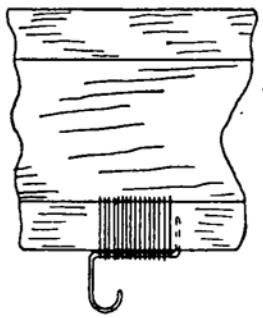
FOKKER D-8
BY EARL STAHL
SCALE 1/3"=1"



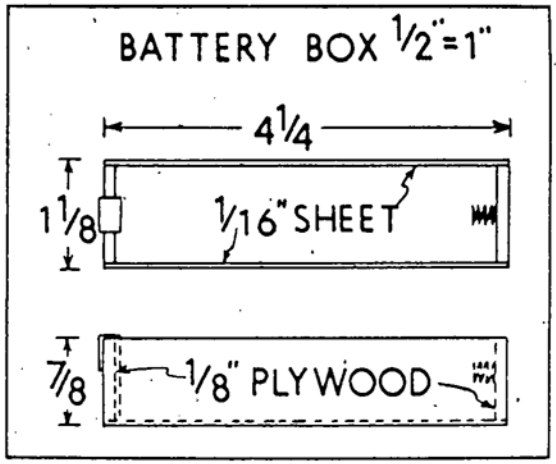


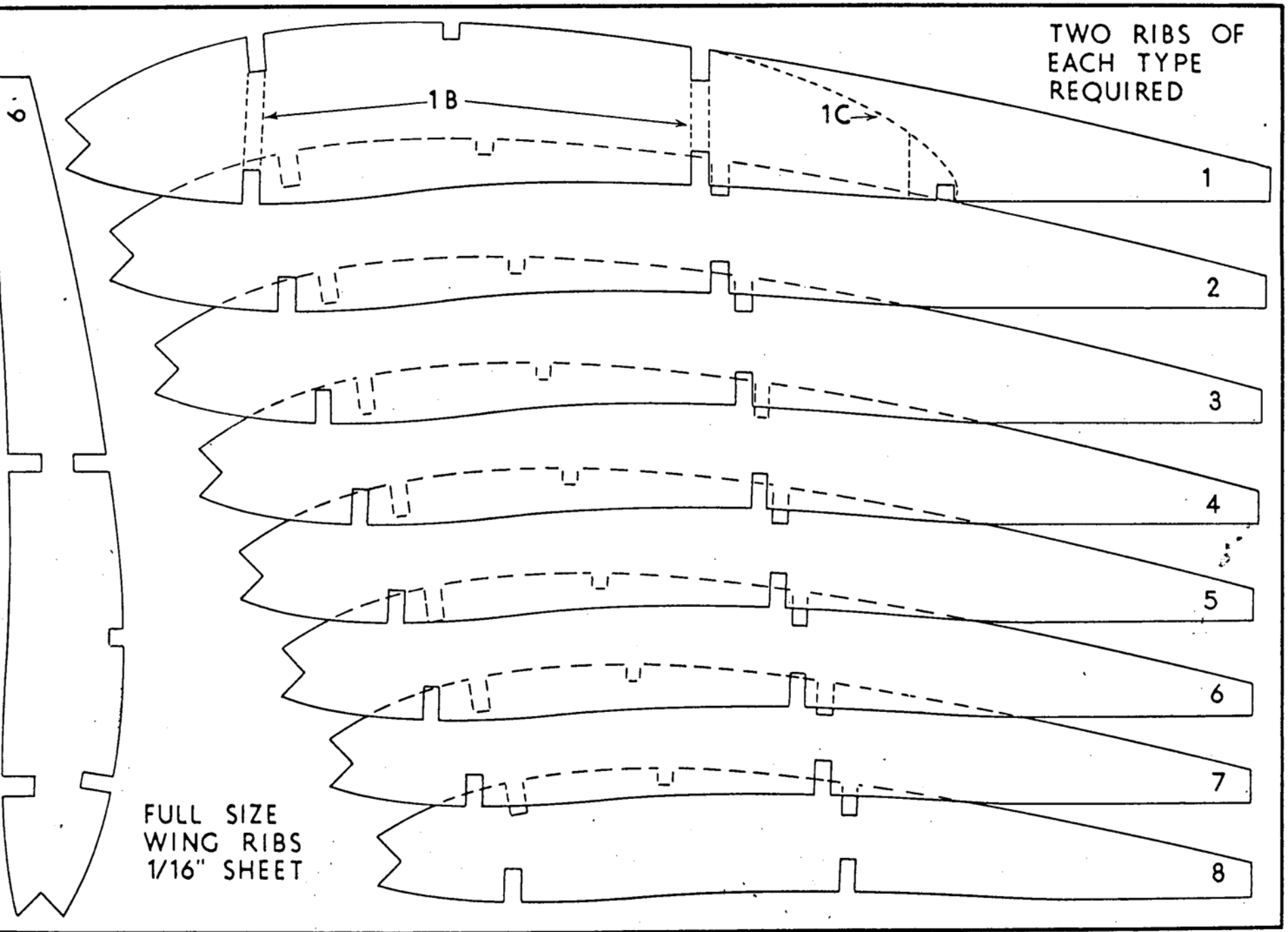
1/8" SHEET DIHEDRAL REINFORCEMENT
2 OF EACH REQ'D (FULL SIZE)

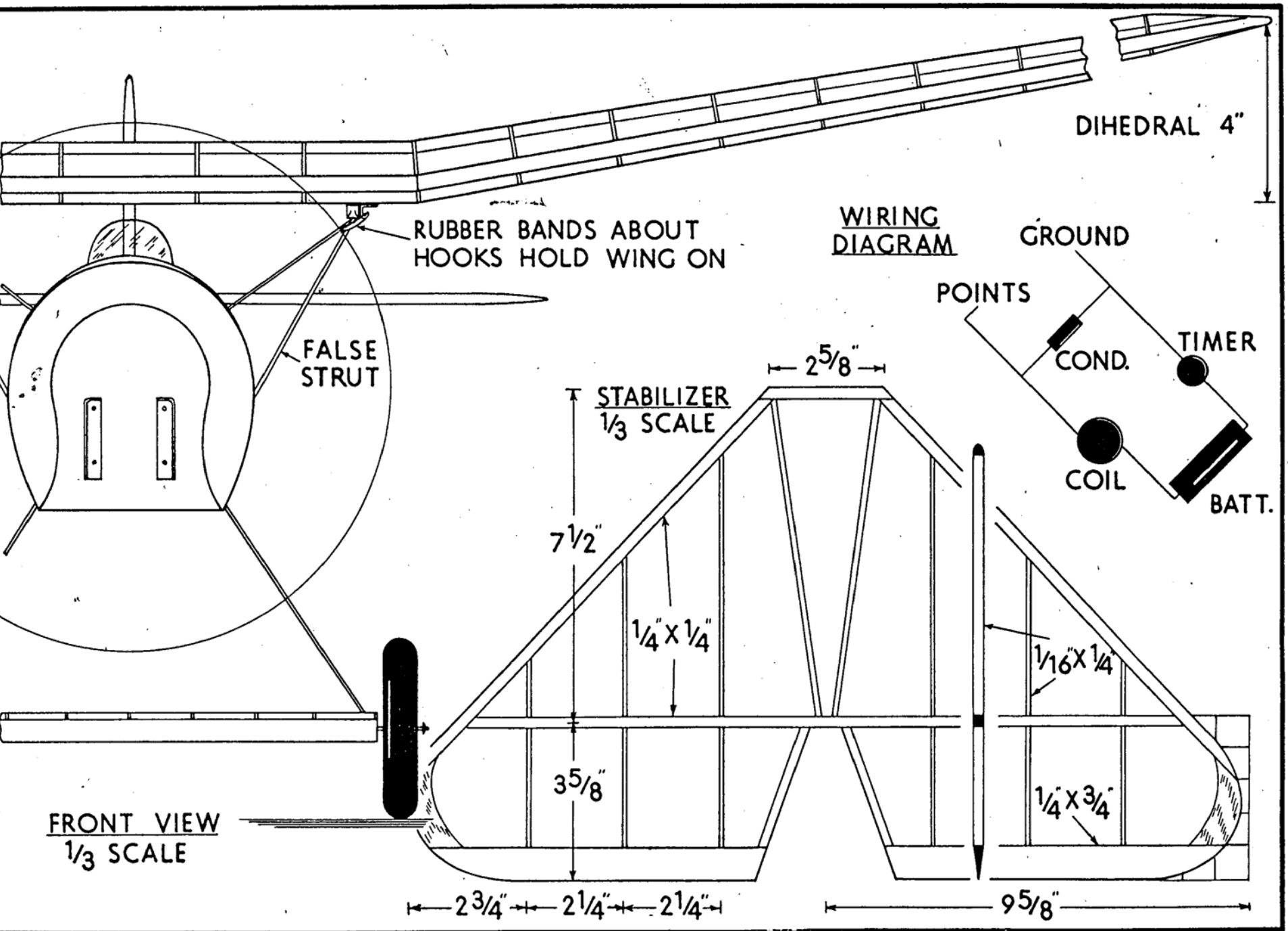




WING HOOK
.040 WIRE
(FULL SIZE)




TWO RIBS OF EACH TYPE REQUIRED
1B
1C
1
2
3
4
5
6
7
8
6"
FULL SIZE
WING RIBS
1/16" SHEET


DIHEDRAL 4"
RUBBER BANDS ABOUT HOOKS HOLD WING ON
FALSE STRUT
WIRING DIAGRAM
GROUND
POINTS
COND.
TIMER
COIL
BATT.
2 5/8"
STABILIZER 1/3 SCALE
7 1/2"
1/4" X 1/4"
1/16" X 1/4"
3 5/8"
1/4" X 3/4"
FRONT VIEW 1/3 SCALE
2 3/4"
2 1/4"
2 1/4"
9 5/8"

DURING the closing weeks of the first World War there appeared over the front lines a nimble little monoplane that is generally credited as being the finest fighter of its day. This was the famous Fokker D-8 of the German Imperial Air Force. Powered by a rotary Oberursel engine of 110 horsepower, the D-8 had a speed of 115 m.p.h. It climbed at a rate of 1,500 ft per min. and could ascend over four miles. In the ability to maneuver and dive it was unexcelled. So superior was the performance of this ship that it would have been a tremendous blow to tile Allied air forces had any, great number been completed before the war's end.

In selecting a design for a flying scale gas model one call scarcely find a better subject than the Fokker D-8; for here is a plane with aerodynamic proportions similar to the majority of contest models. A very short nose combined with a long tail moment arm, tail surfaces of proper proportions and a parasol wing of generous size, all contribute to the model's stability. In construction the D-8 is extremely simple and practical and anyone who has built rubber or gas models with success should experience little difficulty in duplicating it.

Our model Fokker D-8 was designed to fly successfully with any Class B engine; however even the smaller Class C power plants should prove satisfactory. The wing span is 57" and the weight with intermediate size batteries is 28 ounces. This makes the wing loading about eight and one-half ounces per sq. ft. An inverted Ohlsson "23" swinging a 12" propeller was used to power the original model.

How does it fly? Well, test flights were conducted high in the snow-covered mountains of Pennsylvania with the temperature uncomfortably below freezing. With the regular 20-second engine run, flights of one and one-half minutes were made, which is certainly not bad for a scale model. Entirely unassisted the little ship lifts from the runway after a short run and eases into a fast circling climb. Under power the circles are to the left and at the top of the climb it "rolls-out" into a flat, level glide to the right. Under more favorable flying conditions it should give an even better account of itself, since it attains enough altitude to take full advantage of rising currents.

Before construction can be started, it will be necessary to enlarge some of the plans to full size; with the exception of the full size fuselage formers and wing ribs most parts are shown one-third full scale. Obtain a large sheet of ordinary wrapping paper and "scale-up" the plans to actual size. A pair of draftsmen's dividers will simplify the task since it will only require "stepping-off" each dimension three times. When duplicating the side view of the fuselage, the top line of the upper longeron should be used as the reference line since it is straight. In duplicating curved parts such as the rudder, draw squares of the indicated size and then draw the curved line through the corresponding positions. Now for the actual construction.

Fuselage

The fuselage is of standard construction. Build two side frames using ROCK HARD 3/16" sq. balsa for the longerons and cross pieces. Build one side atop the other to insure that they will be identical. When the sides are dry, remove them from the plan and turn them up-side-down over the top view. Pin them the proper distance apart and cement cross pieces to place, being careful to keep the whole structure lined up evenly.

Fuselage formers come next. Make complete paper patterns of each and then cut them from 1/8" sheet balsa. Two each of formers 1S, 2S and 3S are required. Cement the formers to their respective places. The fairing strips are medium grade 1/8" sq. balsa. It will be noted that many of the formers lack notches so when this is the case, the fairings are cemented directly to the sides as shown. The cockpit is made of 1/16" sheet. Cement several sheets together so the stock will be wide enough and then cut out the center to the shape indicated. The cockpit piece is then fitted accurately into the space between formers No. 4 and No. 5 and cemented fast.

The tapering strips that give the stabilizer its correct incidence are shown on the plan. They are 3/16" wide and taper from 3/32" to zero. Two are required and they are glued to the fuselage with the 3/32" end at the rear.

Landing Gear

Landing gear struts are formed to the size and shape shown. 3/32" diameter music wire is used for the front strut while 1/16" diameter wire is used for the rear. A vise is very helpful for bending the wire but heavy pliers can be used if necessary. Bend the struts accurately and note how the rear one is bent to join with the front.

The struts are solidly attached to the fuselage structure-the spring of the wire being sufficient to absorb the shock of landings. Use strong thread or light twine for the purpose of binding the struts to the cross pieces and longerons, and then apply several coats of cement. The 3/16" sq. diagonal ones shown on the plan are cemented to place once the landing gear is attached. Join the two landing struts with solder. Two No. F-1 reinforcements are cut from extremely hard 1/8" sheet balsa; cut the several notches so they will fit accurately over the cross members of the fuselage and landing gear wires. Cement these to the bottom longerons and uprights to strengthen the fuselage.

Fairings on the landing gear struts are simply soft strips of 1/16" sheet balsa, attached to the wire by strips of tissue wrapped spirally around both. These should not be attached until the fuselage is covered, however.

Because of the unusual size and shape of the wheels it will be necessary to make each of them from three discs of very hard 1/4" sheet balsa that have been laminated together. If the builder has access to a lathe it will help, but the wheels can be shaped accurately with a sharp knife and some sandpaper. Bushings of some sort must be used to permit free and accurate turning. If the wheels are covered with silk they will be greatly strengthened.

Wing Mount

While construction of the wing mount is not difficult, it must be made with the greatest of accuracy. The three cabane struts are shown in detail and all are made from 1/16" diameter music wire. Make accurate full size sketches of each strut and then use them for patterns to aid in shaping.

Note the side view of each strut to determine how the ends are bent. Attach the front and center members to their respective positions on the fuselage; strong thread is used to attach them to the longerons. Ends are adjusted to meet accurately and then they are soldered together.

Attach the rear struts. Next select two pieces of 1/4" sq. white pine for the wing rests; neatly attach the pine pieces to the struts with thread wrappings. Once the wing rests are in place they should be checked for correct incidence. If the top of each pine strip is exactly parallel to the top fuselage longeron, it is correct; but if it is not, it must be removed and the proper adjustment made to make it exactly right. This is very important. Apply several coats of cement to all thread bindings and joints once the wing mount is properly aligned.

. As shown on the side plan, triangular shaped reinforcements are used to strengthen the upper longeron at the wing mount. Cut these gussets from medium grade 1/8" sheet balsa and then cement them to place at stations No. 1 and No. 3. To strengthen the fairing strips to which the false struts are later lightly attached, it will be necessary to glue triangular shaped 1/8" thick strengtheners to the back of the first bulkhead as shown on the pattern for the fuselage formers. After the wing is completed the tops of the wing rests are fitted with pieces of balsa strip so they will conform to the curvature of the wing's under surface. The cabane strut fairings, small blocks to prevent wing sliding, false struts, etc., are completed later.

Engine Unit

A removable engine unit is featured. Obtain a 6" x 6" piece of 1/8" birch plywood for the engine bulkhead; it should be free from warps. Half the full size bulkhead is shown on the plan. Use a jig saw to cut the piece to shape. As shown by broken lines on the plan, 3/16" sq. strips of balsa are fitted to the back so the bulkhead will fit snugly to the fuselage front.

Aluminum motor mounts are used. A pattern is given which will enable the builder to bend them from 1/32" sheet aluminum. Most of the model supply houses carry mounts that will prove satisfactory. These should, however, be modified so the front mounting hole will be 2-5/16" from the back.

Several of the mounting holes are shown on the engine bulkhead pattern. The position of these holes is correct for all inverted Ohlsson "23," but if you expect to use any other engine or mount the Ohlsson upright, the location of the various holes must be changed. The important thing to remember is to keep the line of thrust exactly where it is shown on the plan.

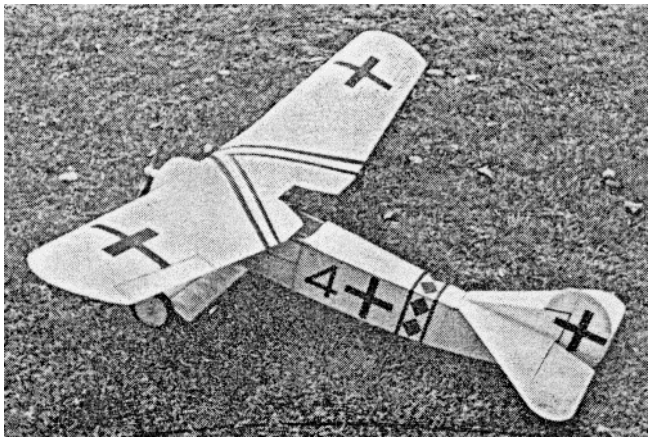
Because of the very short cowling it is necessary to mount the engine close to the fire wall. For this reason a hole must be made in the bulkhead into which the intake tube call be fitted. Naturally this makes it impossible to choke the engine as usual; on the original model we simply primed it through the exhaust port with an eye dropper and this method proved to be quite satisfactory. Depending on the engine used, it may be necessary to fit a piece of rubber tubing over the intake and then extend it out the fuselage side to facilitate operation.

With the exception of the first few glides and power flights, a cowling has been used at all times. The engine runs well within the cowl and it keeps the oil off the ship. Without it the model loses its snappy appearance and it seems to fly better when the cover is in place. An aluminum cowling is used on the plane shown in the photos and after many flights it remained undamaged and in excellent condition. This was made from a 5-1/2" diameter aluminum cowl as stocked by the model supply houses. The bottom was split and the metal was stretched enough to make it fit to the engine bulkhead. Then, using shears, the bottom edges were trimmed to shape as indicated.

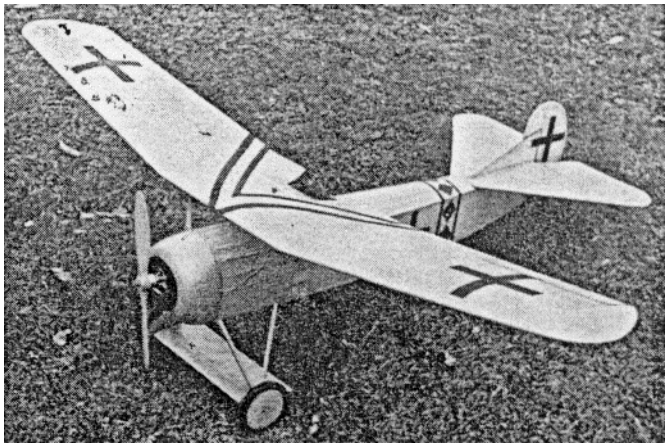
Those who desire to make their own cowling can build one from laminated balsa discs, or possibly a plastic cowl as described in an article in the September 1940 issue of MODEL AIRPLANE NFWS will appeal to the -builder.

Use of a cowling will naturally require that extensions be added to the needle valve, gas tank and possibly the spark control. Depending on the engine used, these items must be worked out to suit each individual case. Four small hooks bent from .040 music wire are cemented to the front of the engine bulkhead so rubber bands call be wrapped about them and the wing and landing gear struts to hold the engine unit in place.

The concluding installment for building the Fokker D-8 will be published next month.



Square fuselage and tail surfaces are easy to build



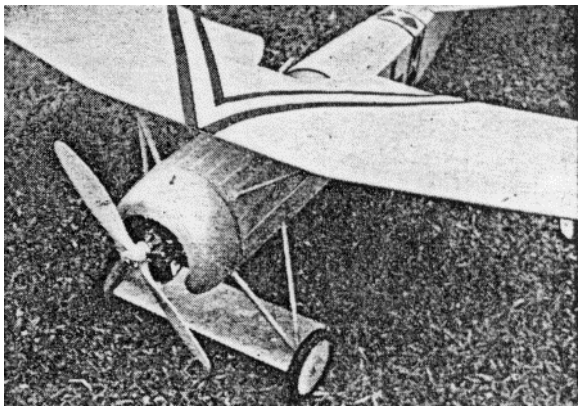
The most realistic model you will ever build

FOKKER D-8
Flies Again

A Realistic Gas Model of a Famous Fighter That Performs Like a Contest Plane

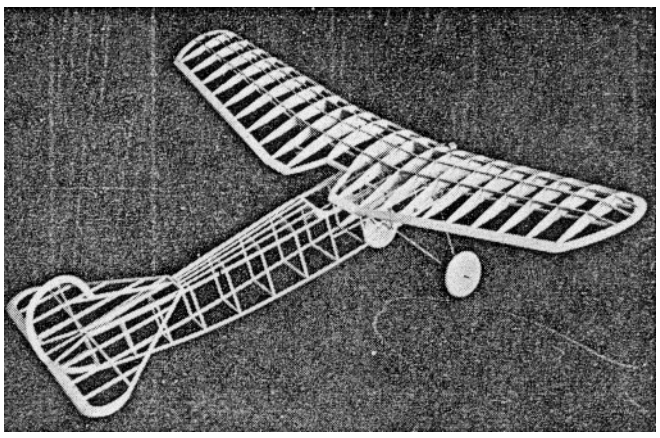
By EARL STAHL

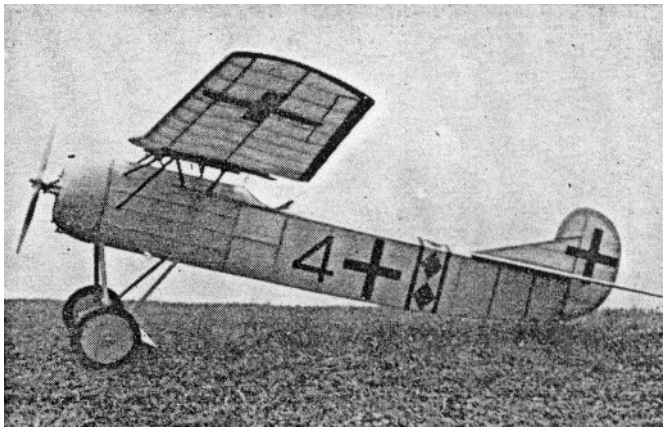
PART 2



Its interesting details give fine appearance

A steady exhibition or contest flier





The frame is light and carefully designed

On the field it looks like the full scale plane

IN THIS, the second and concluding part, plans and instructions for completing the flying scale Fokker D-8 are given. If you wish to begin construction of this realistic, fine flying model, we suggest you get a copy of last month's MODEL AIRPLANE NEWS and catch up with the job. For those who are ready to continue, the first step is to "scale-up" to actual size the various parts.

Wing

Begin constructing the wing by cutting the various ribs from 1/16" sheet balsa. Two of each type are required. Rib No. 1-B is identical to No. 1 except that the area between the spars is removed; No. 1-C has the trailing edge removed to extent indicated by the broken lines. Sand all ribs smooth and cut notches for spars with the exception of the 1/8" square upper spar; all others are 1/8" x 1/4".

Assemble the wing in three parts: Two outer panels and center section. Taper the 1/4" x 3/4" trailing edge pieces and pin them over the plan. Use pins or brads to hold ribs in place and then attach the 1/4" square leading edge. Select hard 1/8" x 1/4" stock for the spars but only cement lower ones to place. The tip pieces are cut from 1/4" sheet. When assembling the center section, it will be necessary to cut the curved pieces, where the wing is cut away, from 1/4" sheet. The short piece extending beyond the 1-C ribs is 1/2" x 3/8".

Before joining the three parts, the ends of the leading and trailing edges are cut to their exact length. Now pin the center section to the work bench or other level surface; then elevate the tips of the outer panels to the extent of 4". Accurately join the various members and cement thoroughly. Add upper spars and then cut dihedral reinforcements from very hard 1/8" sheet. Fit these accurately between the spars and ribs No. 1 and No. 2. The several parts of ribs 1-B are next cemented to place. Recement all joints for added strength. Cut and sand the leading edge and tips to final shape and go over the entire wing structure with fine sandpaper, to remove all roughness, so a neat covering job can be made.

Four wing hooks are bent to shape shown, from .040 wire. These are attached to the wing structure at a distance apart so they will fit snug against the outside of the wing rests. Hold hooks in place by sewing right through the dihedral reinforcement and then around the spars and hooks. Apply several coats of cement.

Tail Surfaces

Construction of the tail surfaces is so easy that very few instructions are required. The rudder plan is shown on the side view; enlarge both the stabilizer and rudder plan to full scale and assemble the parts directly over these plans. The rounded outlines of the rudder are cut from 1/4" sheet as are the stabilizer tips. Leading edges of each are 1/4" square and the ribs are 1/16" x 1/4" strips. Give all joints several applications of cement to help prevent warping and when dry, cut and sandpaper to finished shape.

Covering

Our model of the Fokker D-8 was covered with both silk and Silkspan. Silk is the finest covering material for gas planes because of its great strength. light weight and attractive appearance; the only draw-back is cost. Because the fuselage is subject to so much punishment, we covered this part with silk; the wing and tail surfaces. were covered with light Silkspan. Use thin cement for adhesive and cover the model in the conventional manner. When covering the undersurface of the wing, be careful to stick the covering to all of the spars and ribs to preserve the airfoil's shape. Shrink the covering with water and then apply one or two coats of clear dope.

The smaller details should be completed before the model is colored. As explained before, the cabane and landing gear struts are made streamline by strips of soft 1/16" x 3/16" balsa which are attached by spiral wrappings of tissue or silk strips. But before this is done, the four small hooks illustrated below the cabane strut details are soldered to the wing struts. The fourth strut on each side of the wing mount is a false strut, placed there for scale appearance only. Since this strut carries none of the stress, it should be in de from soft 3/32" x 1/4" cut streamline and then lightly cemented to place. The wing mount without this strut is sufficiently sturdy yet it is also flexible enough to absorb more punishment without damage, than a rigid mount.

After the model has been flown for sometime it may be necessary to repair or replace these two struts, but that is certainly easier than repairing the whole mount or even the wing. Four small blocks are cemented to the pine wingrests to keep the wing from sliding: use soft balsa so they will break off in the event of an accident and thus protect the wing from serious damage. Typical on all Fokker war planes was the small wing between the wheels. This can easily be reproduced but is not *recommended when flying the model since it would probably "trip it" every time it lands.

Color of the model shown in the photos is flaming red-orange; this is especially striking with black trim. If possible spray the colored dope on to the covered surfaces: thin the dope and apply two coats. Decorations can be painted on, using masking tape for a neat job, or they can be cut from black tissue and doped to place. Paint tires, tail skid, inside of cowl, etc., black.

Now let's put the parts together to see how she looks. Wheels are held to place by washers soldered to the axles-place a washer at both sides of the wheels so they will turn freely. The stabilizer is cemented to place over the incidence strips and rudder is cemented on next. Off-set the rudder a bit so the model will glide to the right. Check and recheck for cor-rect alignment.

Some builders may not like the idea of permanently attaching the tail surfaces and in this case it will be all right to make them removable, provided some method is devised to make adjustment secure. Bolt the engine mounts to the engine bulkhead with a 1/16" thick washer between the top of the mount and the bulkhead to give the engine the required amount of negative thrust. If a metal cowling is being used, it should be mounted, by small wood screws, to several small

balsa blocks, which are cemented to the firewall. The engine unit is held to the fuselage by four small rubber bands wrapped about the hooks on the cowling and about the front wing and landing gear struts. Set the wing on the pine rests and secure its position by wrapping small rubber bands around the hooks.

Well, there she is-attractive isn't it?

Ignition

To install the ignition system it will be necessary to remove the engine unit. Details of the battery box for intermediate size cells are given. Use the finest grade stranded wire available for wiring, and solder all connections. Broken lines on the side view show the approximate position of the various parts. On the test ship the coil was attached by adhesive tape to a piece of balsa 1/8" x 1" x 3", cemented to the right side of the fuselage structure. The tinier was mounted conveniently in the cockpit and the battery box was permanently attached to the left side of the fuselage just forward of the cockpit. Determine the batteries' correct position by changing them until the plane rests in a level position when held under the center wing spar. The condenser is attached to the engine mount. Now install fresh batteries and your Fokker D-8 is ready to fly.

Flying

First flight tests should be hand glides. Turn the propeller to horizontal and launch the plane at four or five feet of altitude. It should make a steady, smooth glide to the ground but, in the event it stalls or glides too steeply, the batteries will have to be shifted.

Once your D-8 glides well, start the engine and make it run as slowly as possible without danger of stopping. Set the timer for 12 to 15 seconds and hand launch. Observe the flight carefully, making necessary corrections before the next trial. Make all adjustments to favor the glide and then off-set the thrust line to make the power flight as desired. Right or left thrust will control the amount of circle while under power and if it has a tendency to mush or stall, increase the negative thrust a slight amount. While it was unnecessary on the test model, a small aluminum tab can be attached to the rudder to help adjust the circles. Good luck to you!