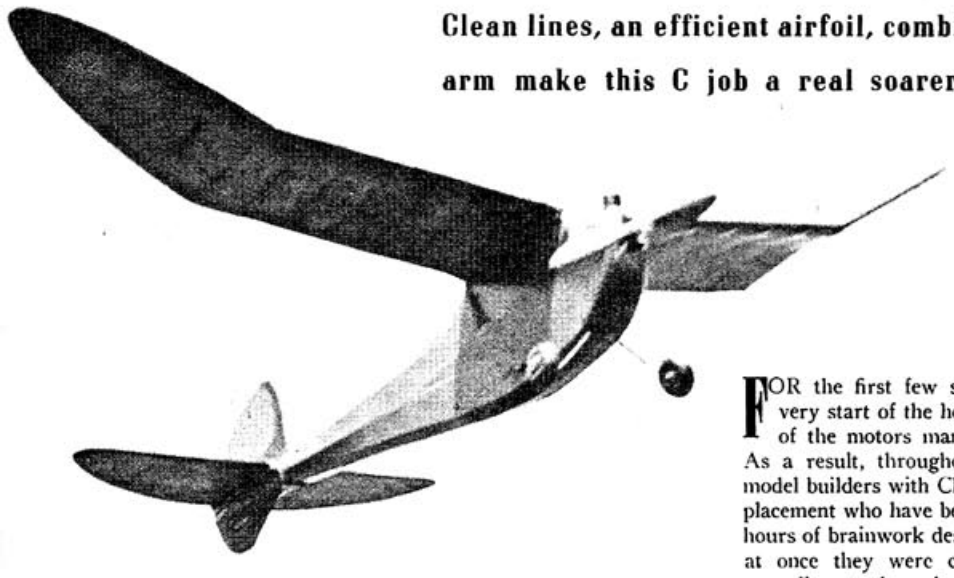
THE GLADIATOR

Clean lines, an efficient airfoil, combined with a long tail moment arm make this C job a real soarer. Averaged three minutes.



PLANS BY PAUL PLECAN

BY MAURICE SCHOENBRUN

The author test-glides the Gladiator. This design somewhat resembles the Rocketeer, another Schoenbrun design. Glide is phenomenal due, in part, to the long tail.

FOR the first few seasons of gas-model building, from the very start of the hobby up until the 1939 season, a majority of the motors manufactured were in the Class C bracket. As a result, throughout the country there are thousands of model builders with Class C motors of around .6-cubic-inch displacement who have been flabbergasted by the new rules. After hours of brainwork designing two-pound ships for these motors, at once they were compelled to build three-pound ships—according to the rules.

Take a good look at those rules again. In order to reach a minimum wing loading of eight ounces per square foot, one must use at least six square feet of area. Now that's a lotta wing. Therefore, the ship on which it is used must be of very clean design, and the airfoil must have high lift and a relatively low drag, so that the motor will not have to "strain" in pulling the ship up into the thermal territory.

We'll skip the long hours over the drawing board, and the brain fag brought about by our mental labors. Sufficient to say that we evolved the Gladiator, which meets all our requirements and which has surprised even us in performance.

The ship is of clean design. A turtleback fuselage with stringers, and additional stringers on side and bottom of the same, give a streamlining that reduces drag to a minimum. The wing has slightly less than the six square feet and has a thin airfoil to reduce the drag and aid the climb. The tail moment arm is a bit out of the ordinary, and in it lies the secret of the phenomenal performance. The added length of this lever will cut down the climb slightly, but the pancake glide more than compensates for the loss in climb. The Gladiator practically stands still after the motor has cut, much in contrast to many speed demons that haunt Class C today.

The ship, in early stages, was quite a problem as far as the position of the center of gravity was concerned. First models had the CG placed eighty-five percent behind the leading edge of the wing. In theory the lifting stabilizer of large area would keep the tail up, but to our sorrow we found that ¼-inch positive was needed in the stabilizer to obtain a good glide. Under power this adjustment caused the ship to dive rather horribly, so we immediately sought a cure. The CG was moved to the position indicated at present which is forty percent behind the leading edge, and immediate improvement was noted. The incidence was removed from the stabilizer and this improved the climb tremendously, and made the glide even flatter.

Directional stability is insured by the large rudder, which is necessary to bring the CLA (center of lateral area to you) back to its present position. Rudder, by the way, is extremely important not only for directional stability, but to aid in making flat turns.

After preliminary flights to make adjustments, the Gladiator began living up to expectations. Many witnesses will testify that the ship consistently turns in three-minute

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flights on a twenty-second motor run entirely without benefit of thermals. The surprising part of this performance is the fact that the motor (a Dennymite) has never been opened to more than half throttle. This conservation of power aids in making the ship a splendid all-weather performer, and its soaring qualities make it lift to the slightest riser.

You won't be disappointed in the Gladiator. It will surpass your wildest dreams, and we candidly believe it will turn in performances that will put your previous best ships to shame. So grab that piece of paper, drafting, scrap, or even a piece from the butcher's counter, and scale up the plans. Then start building for those grand flights that will be yours with the Gladiator.

The Gladiator has turned in some remarkably fine times in actual contest work. In four contests it *averaged* better than three minutes.

At the 1940 Nationals in Chicago, the Gladiator was flown on a twenty-second motor run in a test flight and was lost for the remainder of the day after thirty-five minutes in the air.

During the "Record Trials," conducted during the winter of 1940 by the Metropolitan Model Airplane Council, the Gladiator turned in a flight of 8:50. It took second in the annual gas-model meet of the Richmond Flying Club at Staten Island in August, averaging three minutes, third at the Trenton Gas Meet, averaging three and a half minutes, and has consistently scored in other club contests throughout the East. A similar ship, built by Carl Cecil of the Sky-Scrapers, was lost on a *two-hour* flight during September, although the motor run was but fifteen seconds.

To date the original Gladiator, which was built while the designer suffered a major illness, has had 161 flights, suffering almost no damage, despite landings in cornfields, lumber yards and stone quarries.

CONSTRUCTION

Too many articles describing the building process have made the beginner shy away from construction, but believe us, the construction of the Gladiator is as simple as the squarest box ever called a model. In the first place, note the heavy construction of the fuselage—all of which is $1/4$" square hard balsa. Both sides of the fuselage are the same, of course. To build them exactly the same in all respects the sides should be built one atop the other. Here's how:

Start with that long piece of $1/4$" square which is located on the thrust line and is known as the main longeron. Take two pieces of $1/4$" square, each one long enough to reach from the firewall to the tail. Place one piece on top of the other and pin them to the plan, first resting the plan upon a table top (preferably *not* mahogany). After this (or these) pieces have been pinned in place over the plan, do the same with the bottom longeron. The top longeron of the cabin is placed next. If your plans are drawn correctly, you will note that the front of the cabin is $1/4$" higher than the rear. After all three longerons are in place, cement in the pieces of $1/4$" square vertical braces beneath the cabin, behind the firewall (which has not yet been placed) and between the main and bottom longerons. The Warren truss bracing which extends from the rear of the cabin to the tail is formed of $1/4$" square soft or $1/8$ x $1/4$" hard pieces, and should then be cemented in place.

Oh, yes, cement all joints several times. Next install the motor bearers, which are $5/8$ x $1/4$" gumwood. (Pine, bass or even plywood may be used for these.) Be sure and cement these bearers thoroughly to the under side of the main longeron, which you will note extends to the very front of the plane, other longerons (those on the bottom) extending only to the firewall. When two sides of the fuselage are completed, cut the cross pieces as shown on the plan and form the fuselage proper. The fuselage *must* be $3^5/8$" wide or the ship will not make the cross-section rule. Cut the formers behind the cabin of $3/32$" sheet and cement them in place. When thoroughly dry, cement the stringers of $3/8$ x $1/8$" in place. These insert $1/4$" into the formers and protrude $1/8$".

When the fuselage is completely formed, cut the firewall of $1/8$" birch plywood and cement the landing gear in place before installing the firewall in the fuselage.

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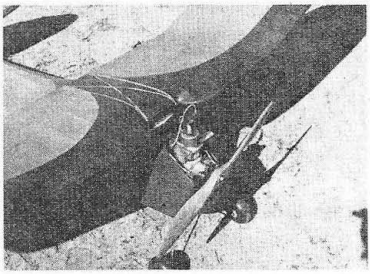
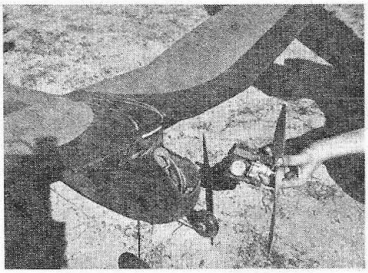
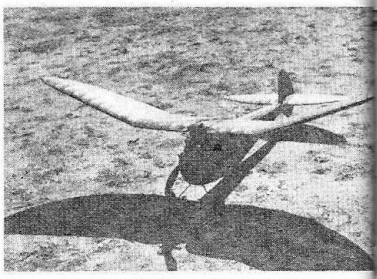


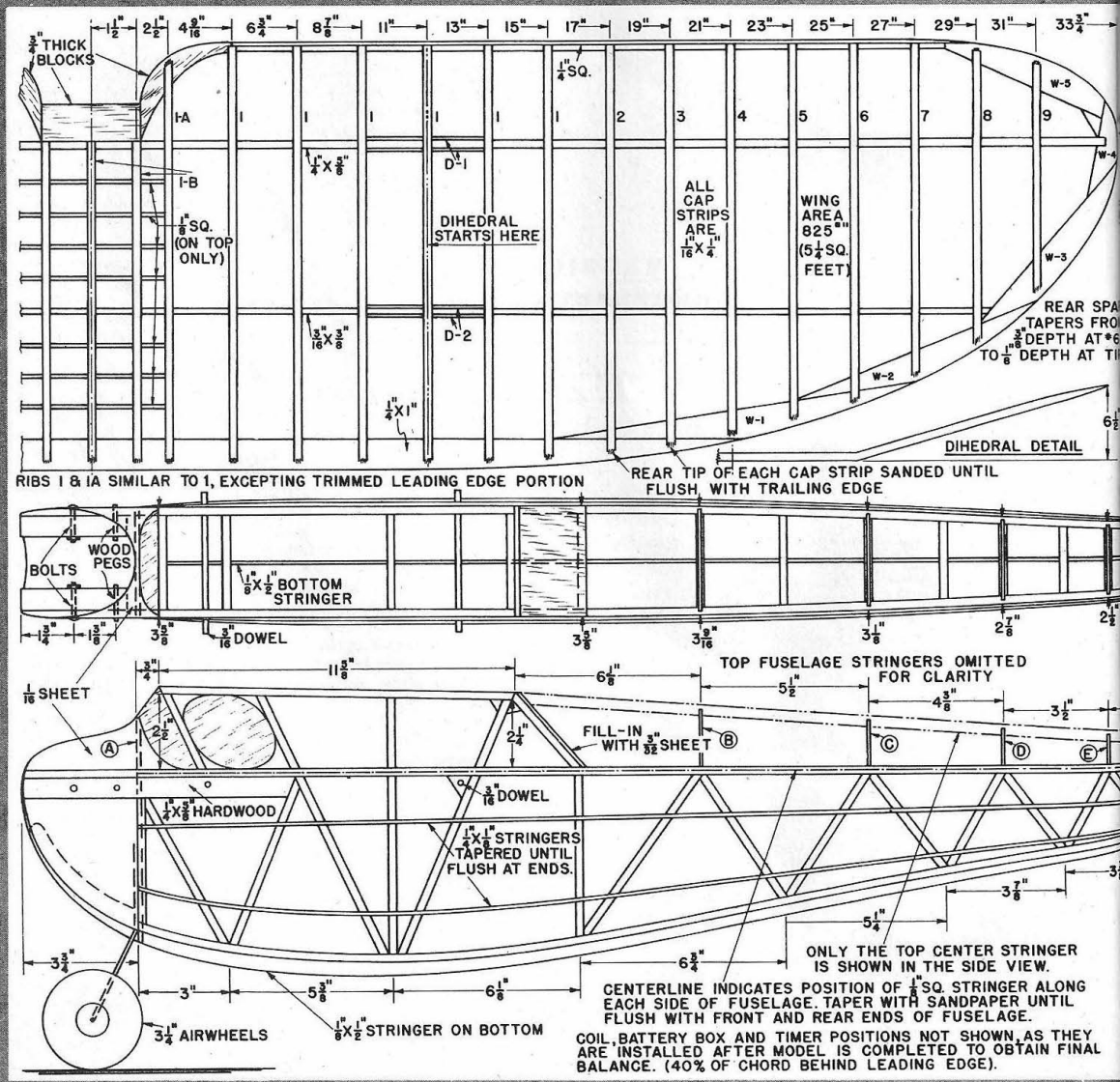
Dennymite is mounted on two bearers. Each bearer is bolted in position and is removable. Accessible, too.

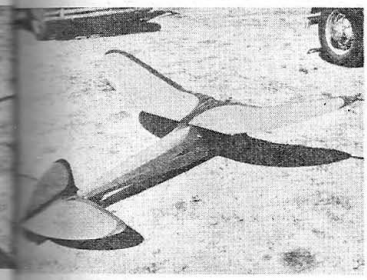


The front attachment is a bolt, rear a matchstick which breaks in a crash, allowing motor mounts to pivot.

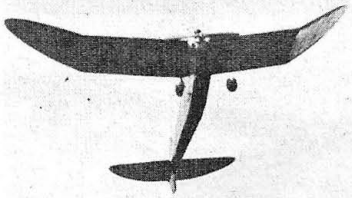


The wing and tail are held in position by rubber looped around dowels projecting from the fuselage sides.

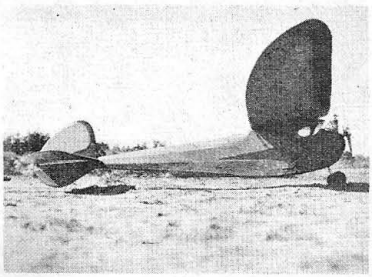




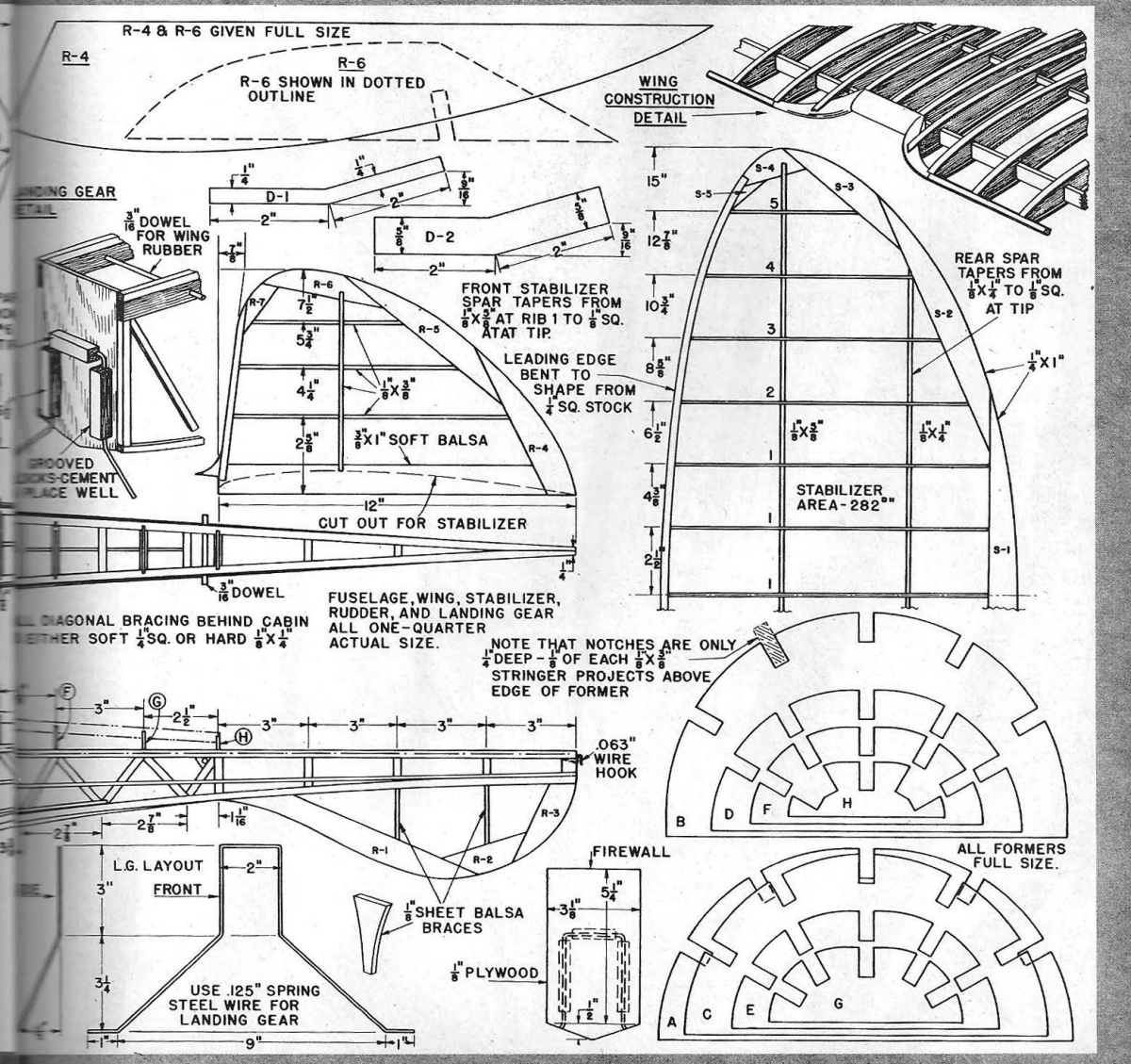
...interesting view showing the Gladiator's long ...uselage. Timer arm juts from fuselage beneath wing.



The Gladiator's glide is really sensational. Soared unofficially for 2 hours, 15 second motor run.



The cabin retains semblance of real airplane. The Gladiator is snappy-looking on ground or in air.



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