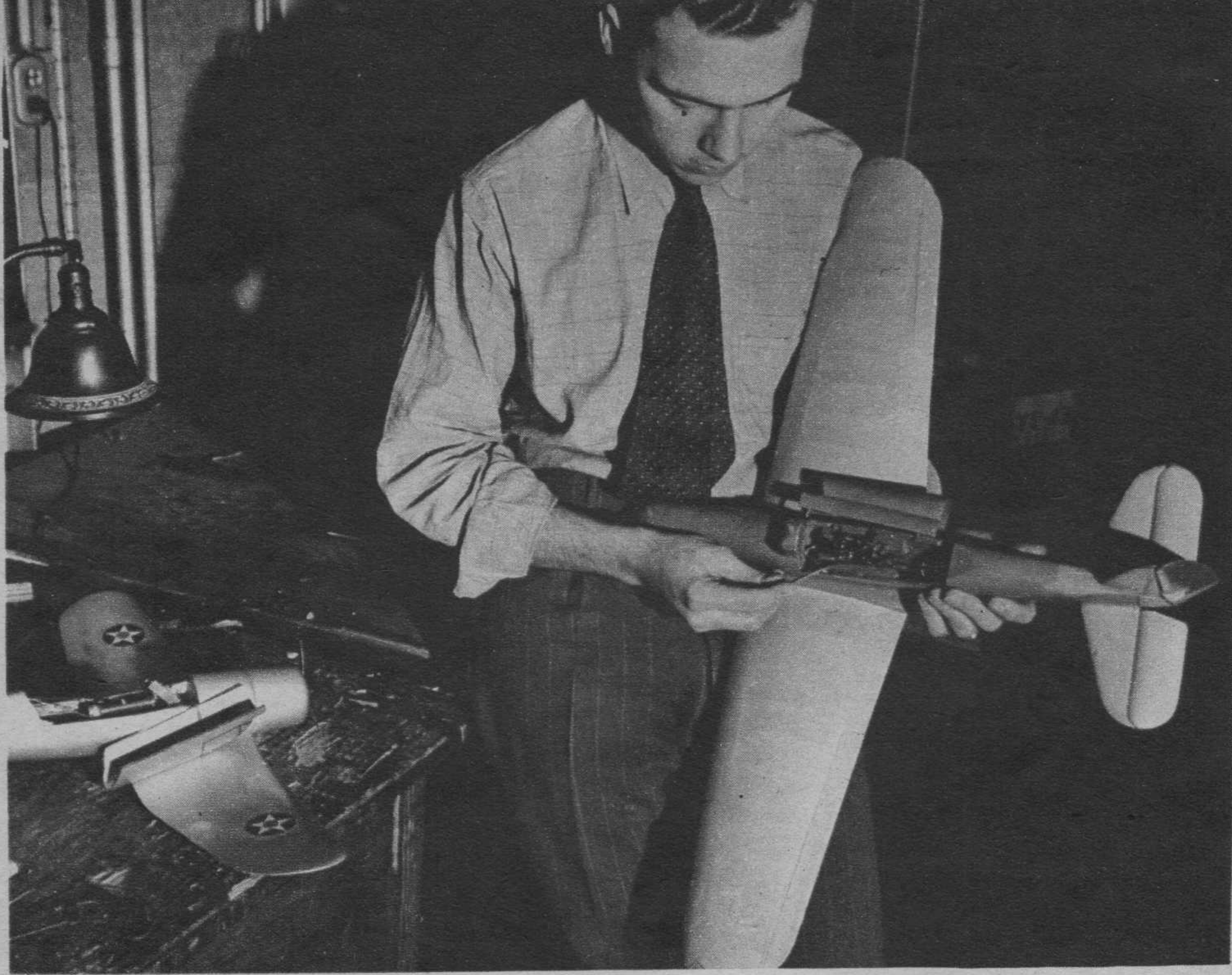




In free-spin tunnel model whirls in vertical air blast. Mechanism inside works rudder to recover. Spin characteristics and recovery are studied.



Jack Johnson holds model, shown left; reveals hollow interior and rudder-actuating mechanism. Models are precision-built to close tolerances. Even c. g. is in scale position.

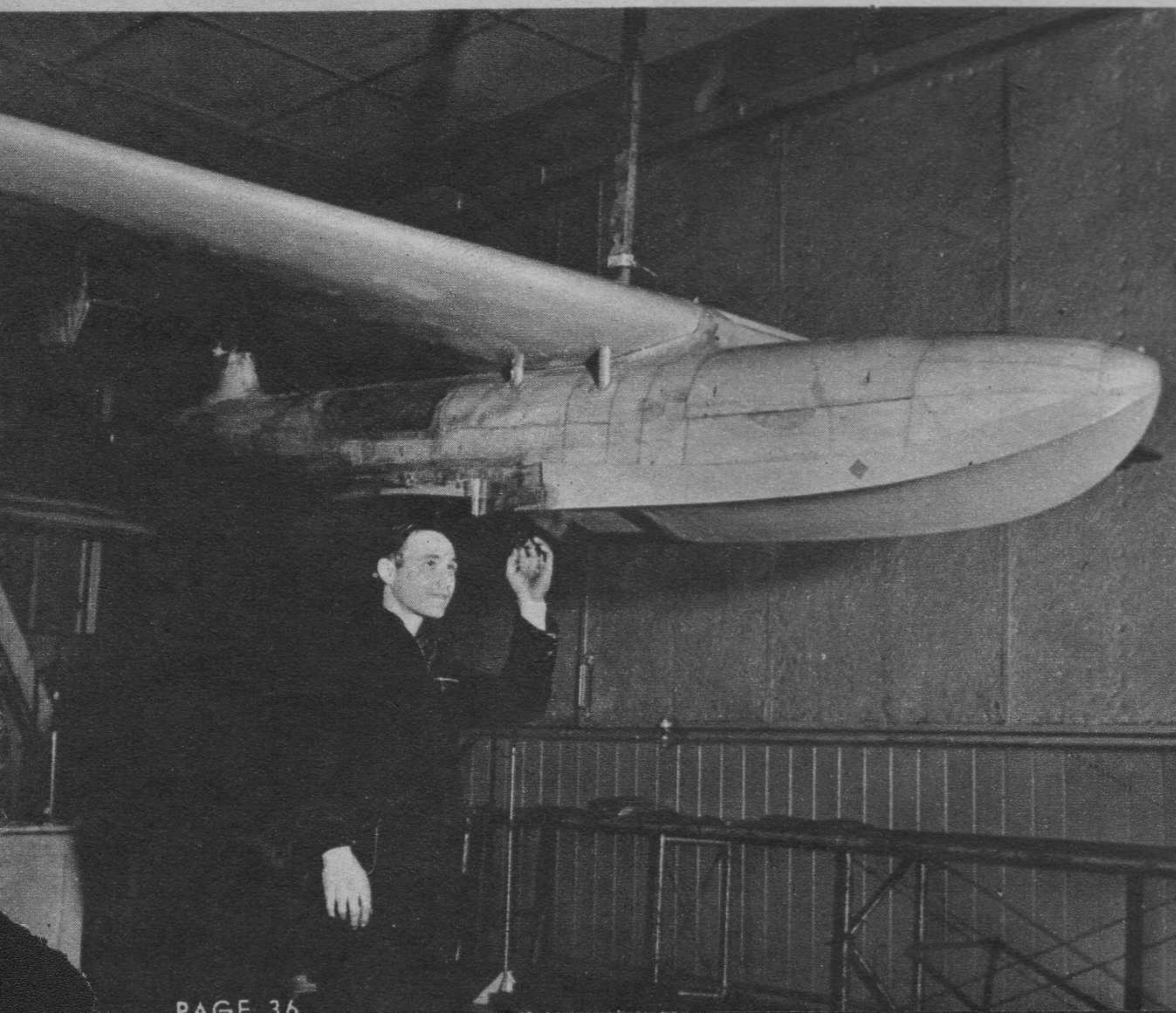
## MODEL CAREER MEN

In the National Advisory Committee for Aeronautics laboratories at Langley Field, Va., more than 200 model airplane builders hold down civil service jobs as "under aircraft model makers," building and testing scale models of new and future designs of military airplanes. The N. A. C. A. finds them of high value in air research because they know theory of flight and the practical details of airplane construction. The experience they gained on the contest field contributes now to the evolution of better fighting planes for Uncle Sam. The model builders who made good at N. A. C. A. are just one instance of the hobby becoming a career. Other cases will follow from month to month.



Va. Gas Model Association, local club, acquired outstanding builders through

Huge flying-boat models and hulls are attached to a special electric trolley and "towed" at high speed in test basin. Camera on trolley records all.



Bob Crawford, facing camera, and Frank Wolak weigh in navy Vought-Sikorsky XF4U-1 model for free-spin tunnel. This particular model has both rudder and elevator controls.







Andy Veryzer with an electrically driven P-35. Model is used in free-flight tunnel (right). Electromagnets activated by impulses sent through a trailing hair wire work the controls.

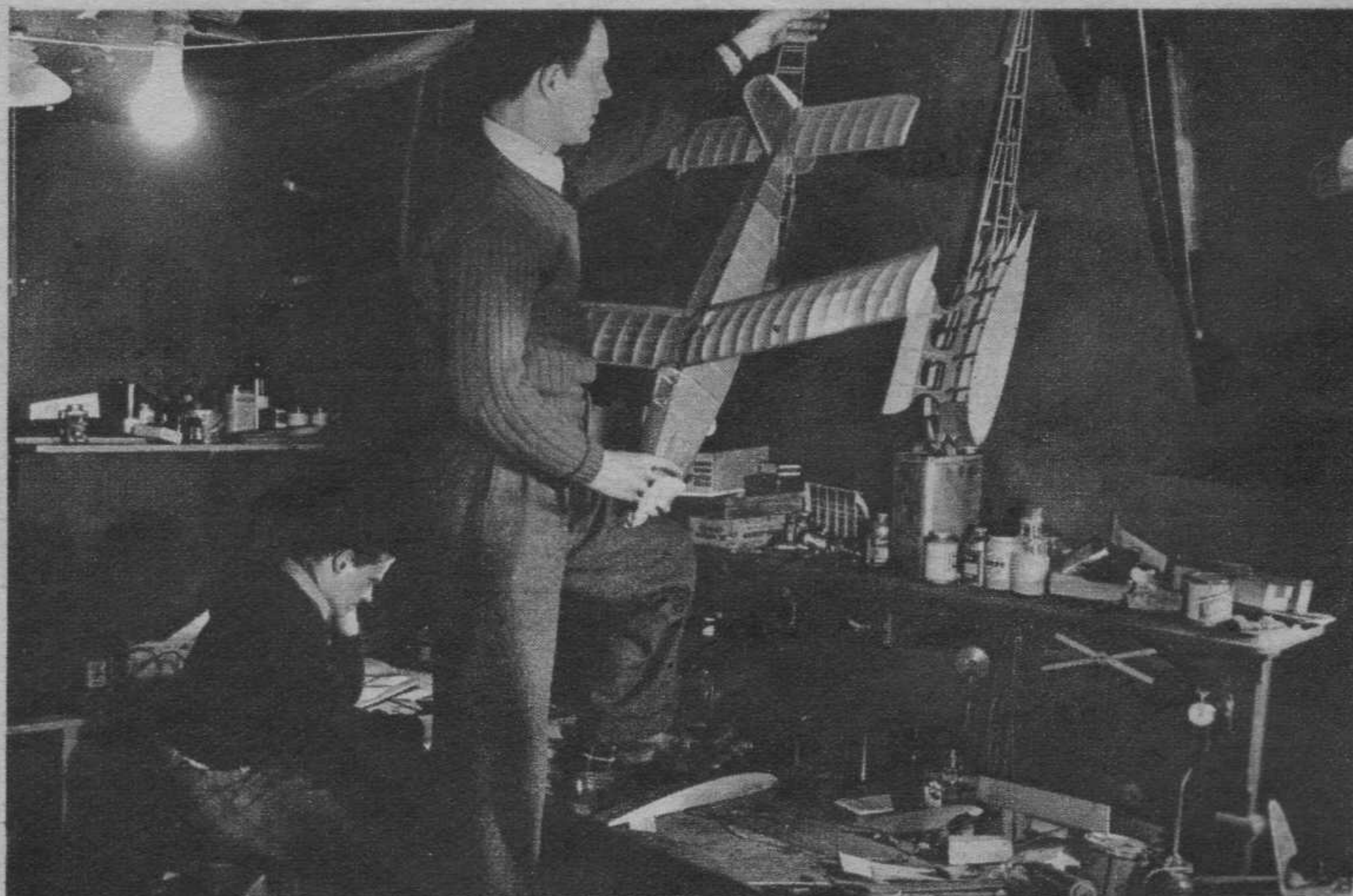


Derwood Derring readies a Brewster dive bomber for free-flight test. "Pilot" controls model from cockpit in tunnel floor. Tunnel tilts to check glide angle.



N. A. C. A. Dick Everett, Caldwell Johnson, Hewitt Phillips, Herb Weiss are well-known.

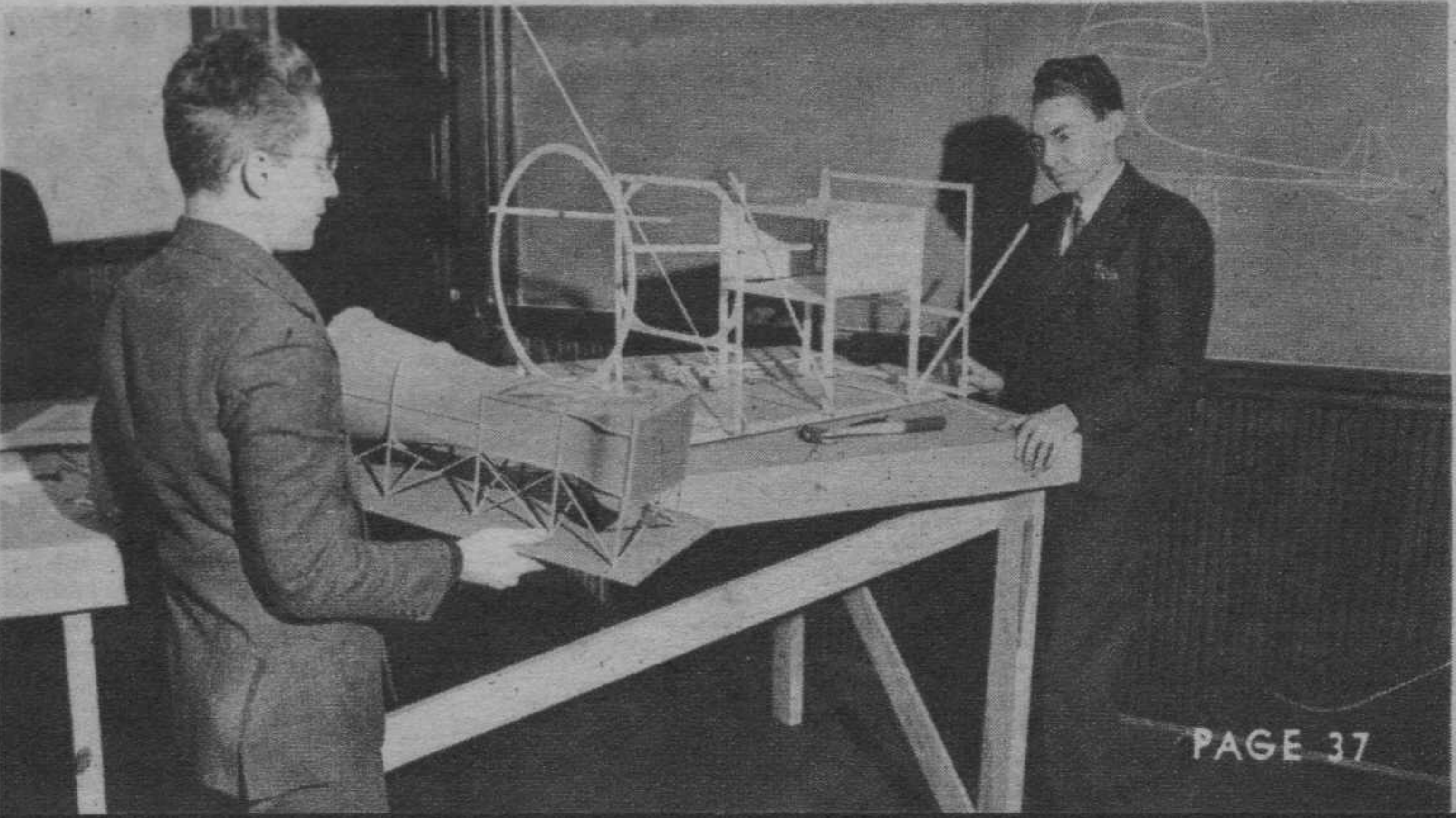
Ted Schnider, left, and Derwood Derring team to scoop out the two balsa-wood halves of a new test model. Langley test pilot once flew free-flight model in tunnel, cracked it up.



Something in common. At Langley modelers gang and room together wherever possible. Barck, top, and John Tribble have home-made bunks.



Herb Weiss, left, Hewitt Phillips, right, with models of wind tunnel designed by Phillips for Virginia Gas Model Association. Shop is old school.



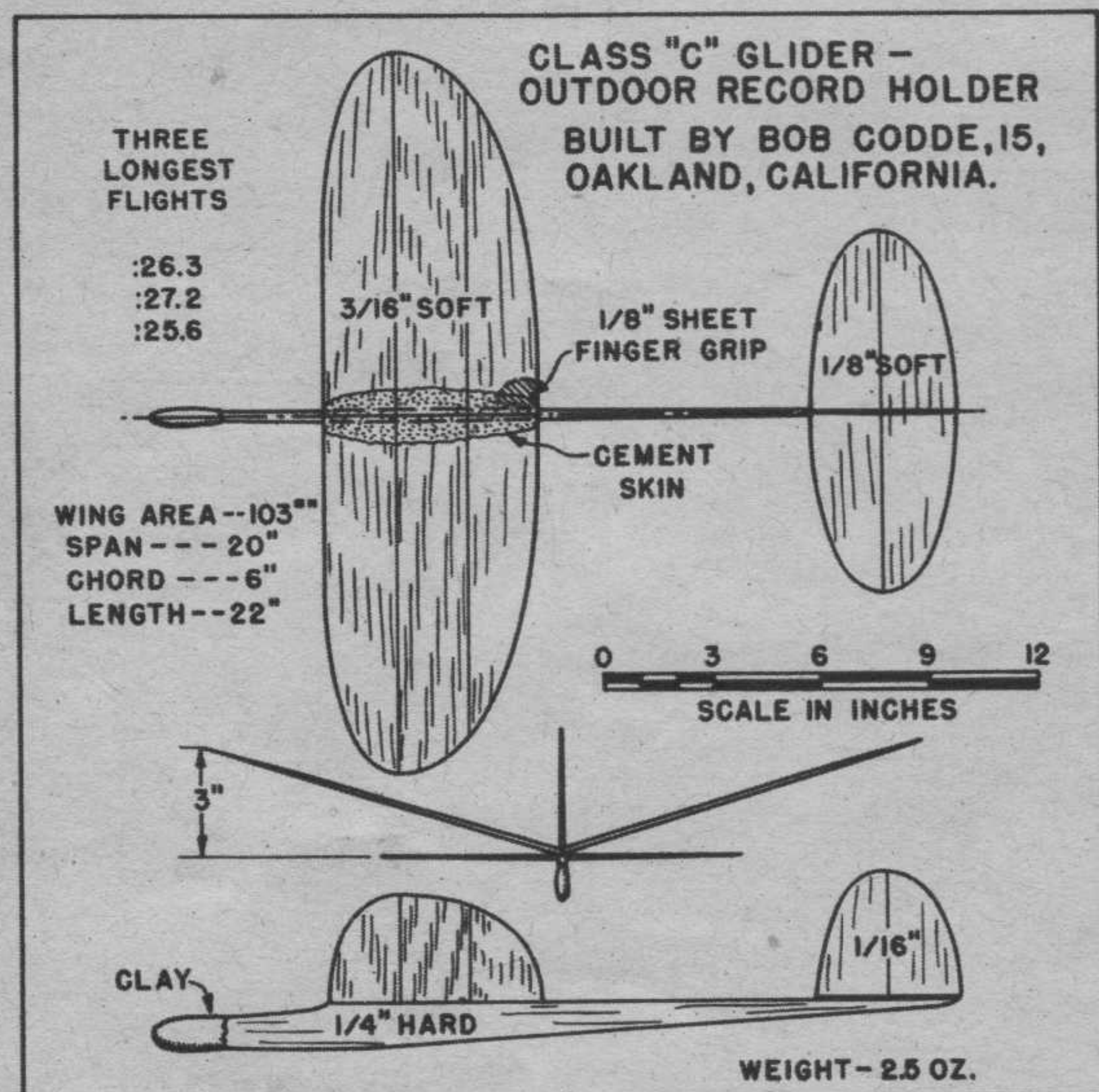


# DOWN THE RUNWAY



Official aeromodeling news compiled by the Academy of Model Aeronautics. Latest additions of sanctioned contests.

CONDUCTED BY AL LEWIS, • EXECUTIVE DIRECTOR



A FEW last-minute notes on the approaching national meet may be in order. (Of course by now you're thoroughly familiar with the details, including the mileage from your front door to the Hotel Sherman in Chicago, competition headquarters.) Arrangements for the battle are reaching new highs. For the first time this year an exhibition of radio-control event entries will be held in the Sherman, thus giving everyone a chance to see the r. c. models during the cool of the evening. Before, one had to take time off from contest flying in order to see these ships, and spectator crowds were so great that policing sometimes prevented a good gander at the radio craft. Another "exhibition" all 'n' sundry are cordially invited to is a meeting of the Contest Board of the A. M. A. The grand ballroom of the Sherman has been set aside for this memorable event. Come prepared to talk on your pet peeve and make suggestions for bigger and better rules if you want. Be sure to have your ideas in typewritten form so you can turn them over to the board after your "speech."

The entire exhibition hall of the Sherman has been turned over to a model and educational exhibit which will feature special displays by aviation schools, air lines and model concerns. The workshop this (Turn to page 57)



## 1940 MOFFETT ELIMINATIONS WINNER

HERE are plans for a ship that is just a bit different from the conventional design of fuselage models. It features an eighteen-inch two-bladed folding prop which gives it a motor run of about 1:15. The ship was flown in competition for the first time in Chicago. Here it proved to be a winner by making two out-of-sight flights, the original model being lost on the last flight. Longest flight was 6:35. Total time for three flights being 834.1 seconds.

### CONSTRUCTION

Begin by making full-size layout of fuselage for which full-size dimensions are given. Cover this with wax paper. Longerons are then pinned on the working drawing and all uprights and diagonals are cemented in place. Note that pins are not put through the wood but along the edges. Both sides are made at once, one on top of the other. Let cement set overnight. Sand outer edges of sides while stuck together. This will produce two sides identically the same. Separate sides with thin razor blade.

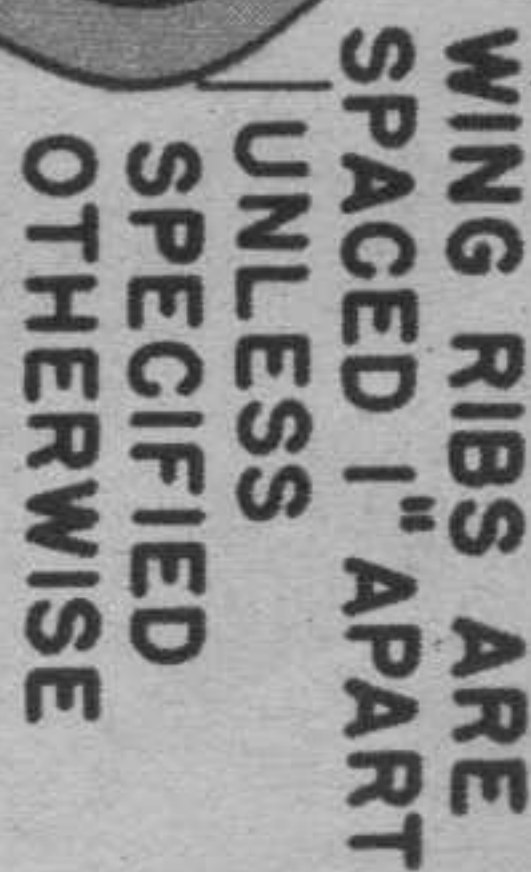
In joining the two sides, start at the widest point and gradually work toward the ends. Use chart for obtaining dimensions of cross pieces. Dimensions in chart are given for overall width. Subtract a quarter-inch from these given dimensions for actual lengths of cross pieces. Use small rubber bands to help hold sides together while cementing cross pieces in place. Check alignment of fuselage as work progresses by placing fuselage, top side down, on a flat surface and with a square held perpendicular to the thrust line against top longeron measure distance between square and bottom longeron. This distance should be (Turn to page 64)

BY BOB REICH

The Nationals were its first competition. Made two out-of-sight flights. The best time was 6:35.







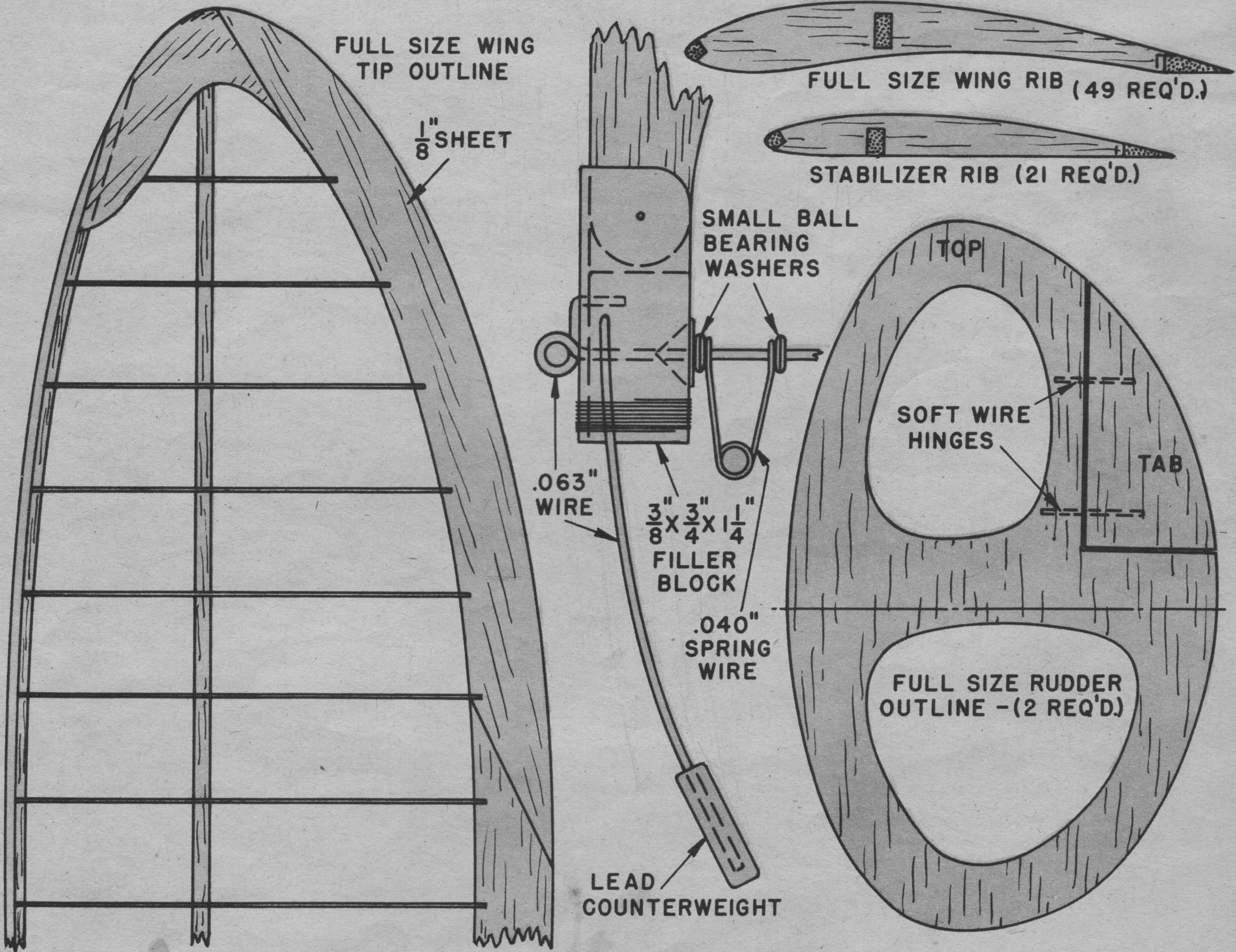
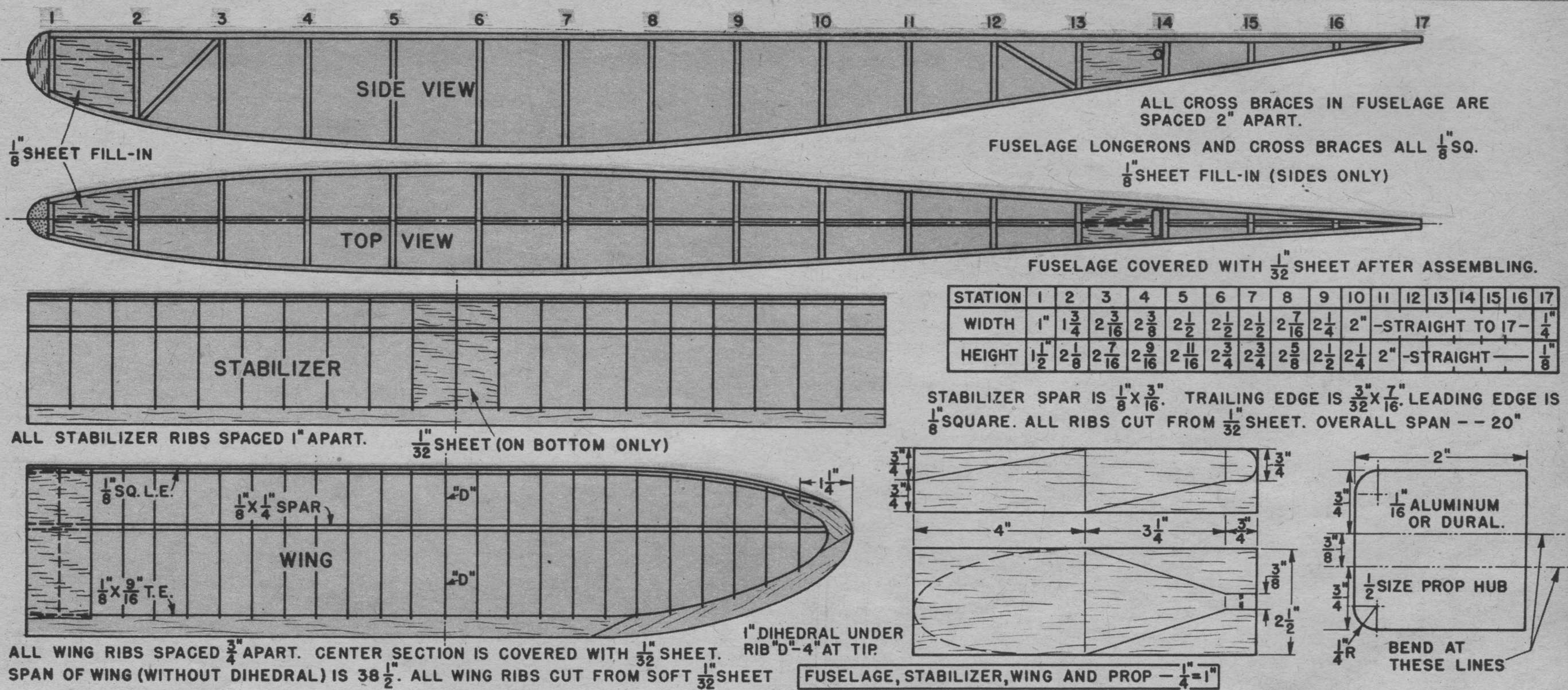
## FUSELAGE SIZES



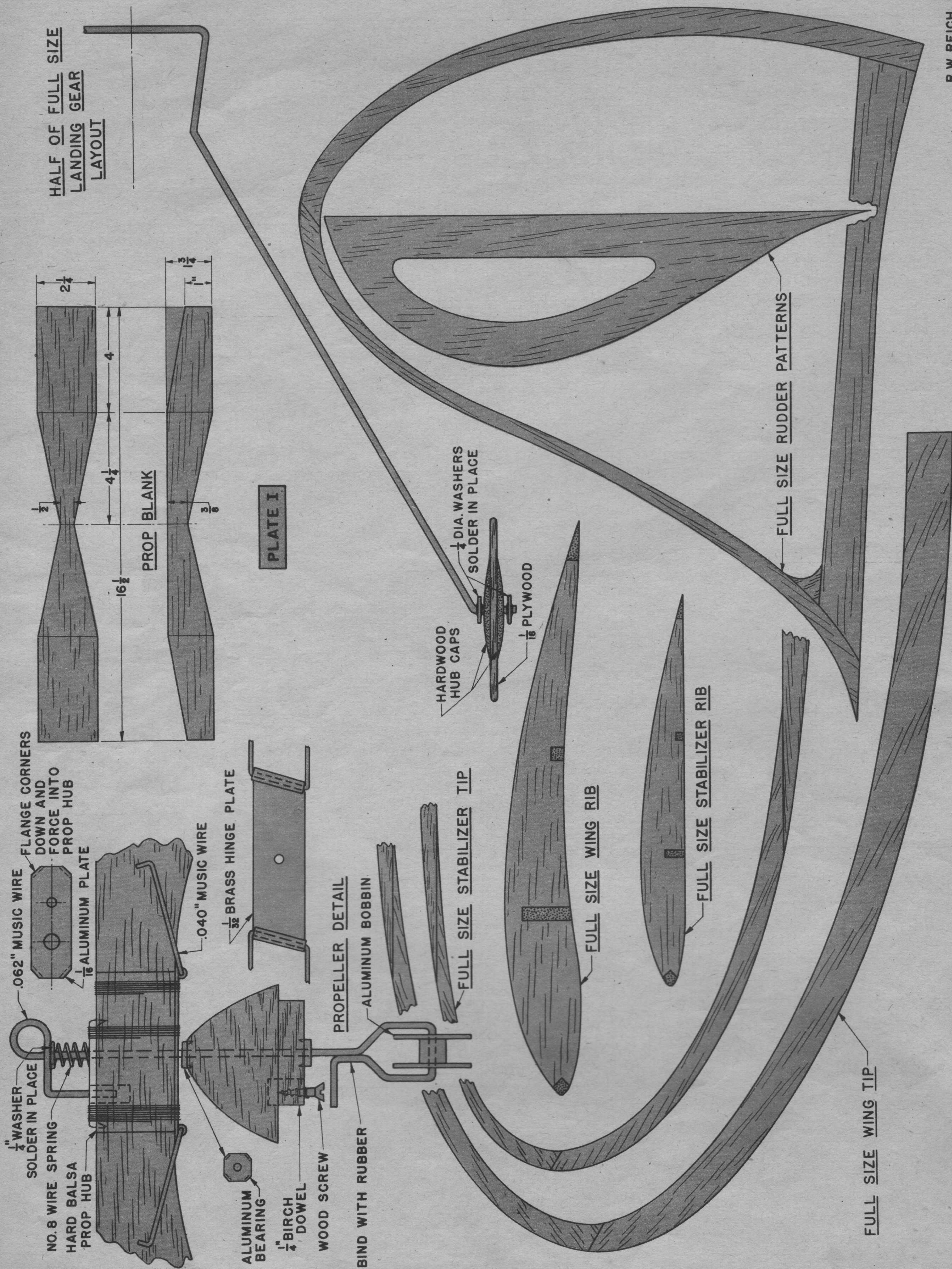


# RECORD STICK

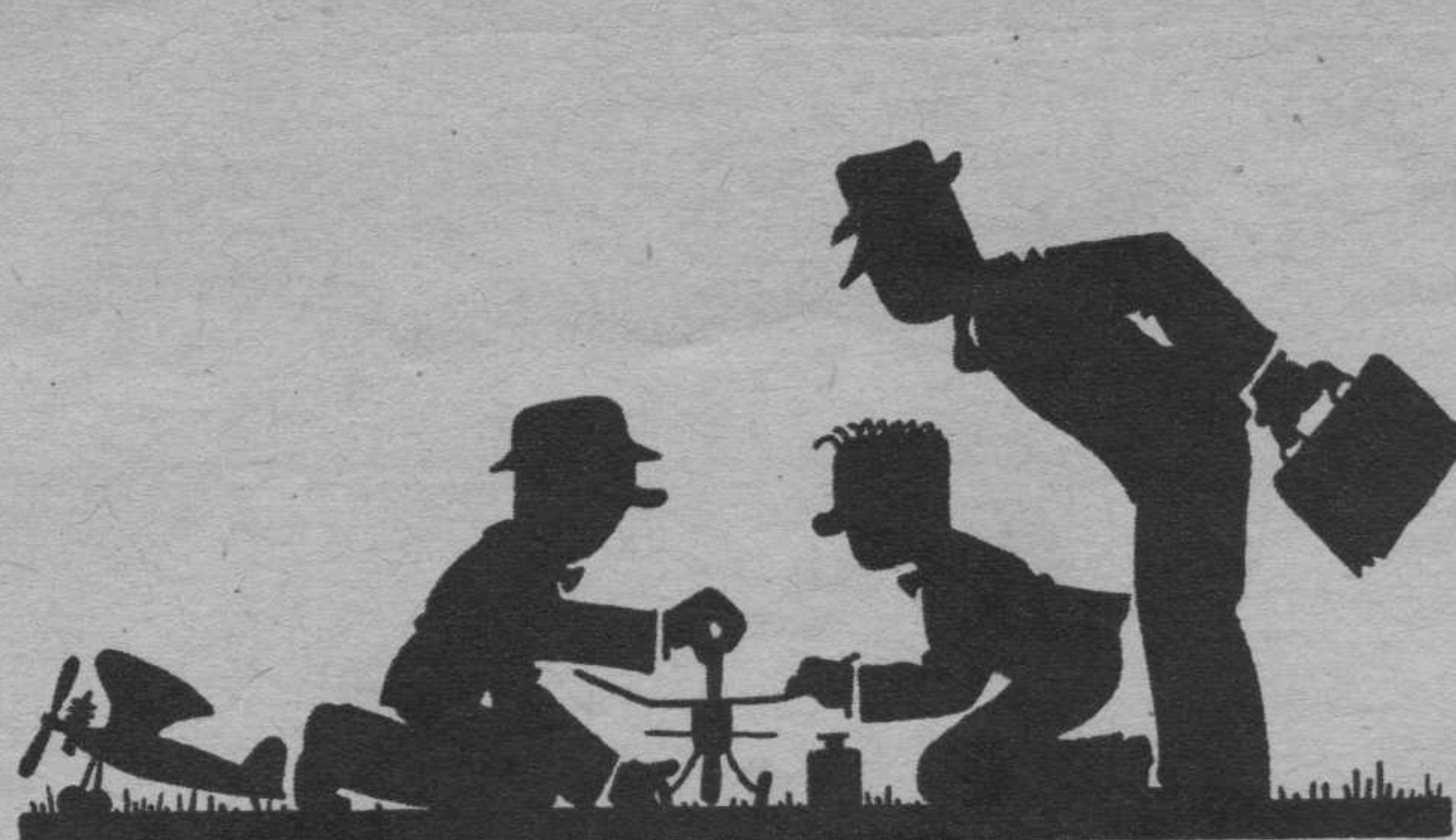
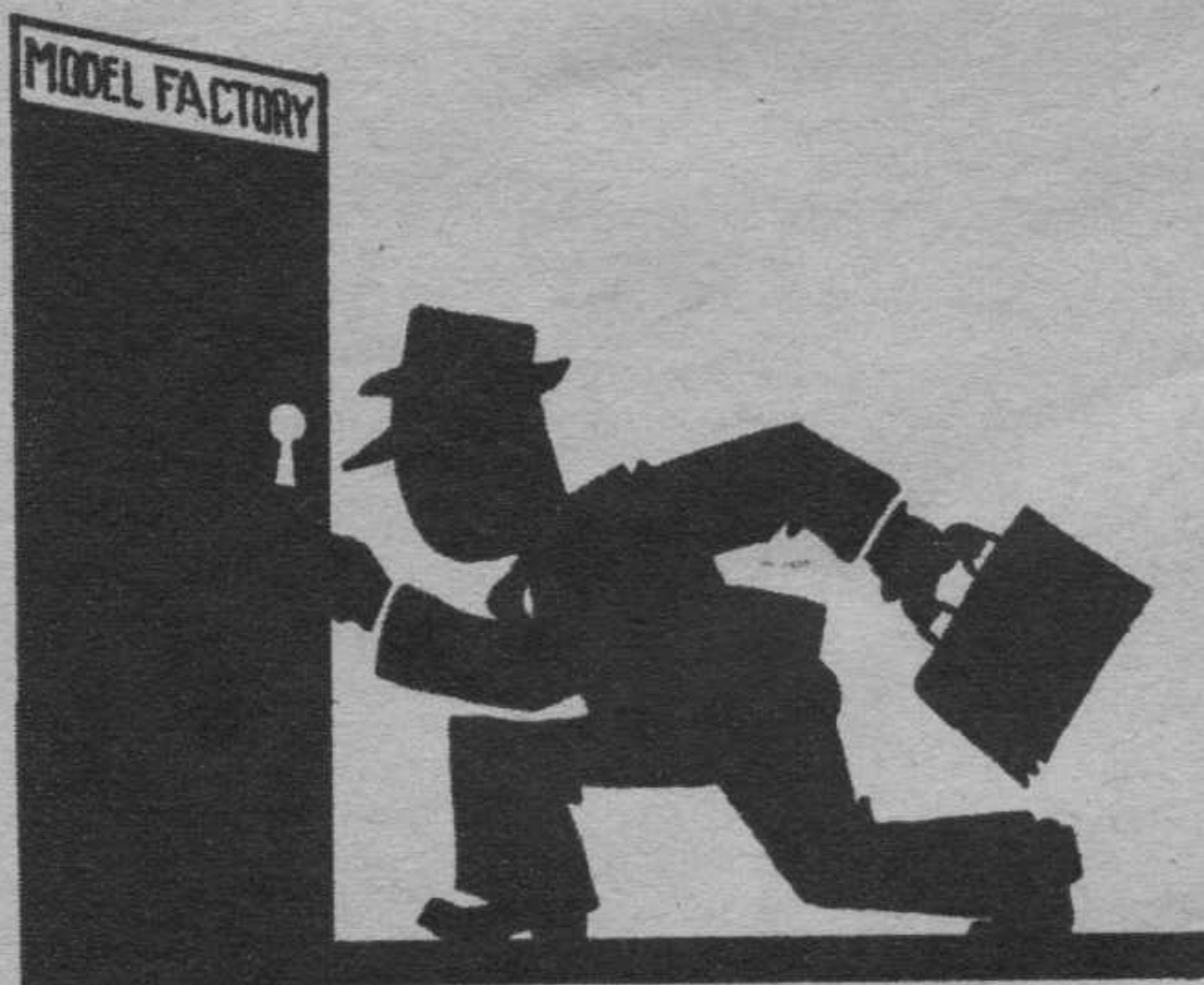
BY ED SWENTON











M. B. Spotts, retailer and distributor.

## LET'S SEE SPOTTS

NOT all the model houses in the United States were built on the "happy-fun" formula, and the firm of M. B. Spotts in Philadelphia is one that was founded and developed through hard work and foresight. When Ben Spotts organized his concern some eight years ago, his assets were worth approximately five lean dollars. Today that same firm carries a stock of \$12,000 worth of merchandise.

Fundamentally Ben realized that modelers want what they want when they want it. Instead of waiting several weeks for their merchandise, they became accustomed to "putting Spotts on the spot," and generally that gentleman produced, gaining the reputation of having one of the largest and most varied stocks of modeling supplies in the East. Gradually the business was extended to the wholesale field, and today the firm of (Turn to page 53)



Philadelphia shop has \$12,000 stock

# "DON'T QUOTE ME!"

Talk of the trade as overheard in factory, field, store.

CLIFFORD WILLAMS ROGERS, president of the Model Industry Association, has presented before the Office of Production Management the model industry's gravest problem—material shortage. While Mr. Rogers was favorably received, the priorities committee has given no decision as yet. Letters from army, navy, aviation and educational authorities as to the value of model aircraft building and flying as a basis for aeronautical education and training, which would help matters greatly, are now being sought for presentation to O. P. M.

Sure, the editor gets complaints. Here's a letter he showed us:

GENTLEMEN:

You will hear from my lawyers in the morning! I am thoroughly convinced that you are some sort of conspirators in a wholesale theft, in which your Arrow plans are crossed with a homing pigeon. I, for one, built one, and on the sixth flight (20-second run) it snagged one of our Indiana thermals. We chased it for five miles and then it went out of sight straight up.

I don't mind the plane so much, but when it made off with my brand-new Forster 29—I hold you personally responsible.

Please print lousier planes in the future.

Disgustedly,

BILL WILLIS

The Willis Shop

3816 North Illinois St.

Indianapolis, Ind.

Righer Manufacturing Co., makers of the Dennymite engines, are not accepting any more orders. Due to lack of materials they will make only parts necessary for repair or replacement of already existing Dennymites on the market. Righer has for some time been resisting tempting orders for defense work—seems the temptation got too great!

"We don't have thermals for sale," explains E. T. Pachasa of Cleveland. We said he did last month. So all you dimwits visioning shortcuts

to trophies better figure on winning your contest the hard way. A thermal is a rising column of air due to a high adiabatic lapse rate, see?

We just read an interesting pamphlet called "The Story of Revoil 404." It seems a regular 4 to 1 mixture of S. A. E. 70 oil and gas is too heavy, clogs the engine, cuts r. p. m., is dirtier and harder starting. Revoil is about as heavy as S. A. E. 40 but according to tests of a 4 to 1 mixture, it proved to have five times the film strength of regular gas and oil. Strobotac tests of a Brown D, Dennymite, Hi-Speed and an Ohlsson 23 showed respective increases in r. p. m. of 7%, 18%, 5% and 4½%. But don't take our word for it. Dealers, write on your letterhead to Beebe Products, Box 841, Rockford, Ill.

The Model Industry Association has completed plans for a model exposition at the Hotel Morrison during the Nationals in Chicago. Manufacturers will have exhibits, and the many interesting exhibits and demonstrations should not be missed by anyone attending the meet. An all-air show will be held by the contest management at the Sherman as usual.

Model Associates Corp. have opened a Chicago office and warehouse at 549 W. Washington Blvd. The two well-known "Dicks," Mair and Watters, are connected with this company. . . . Hobby Distributing Co., Inc., of Chicago, formerly operated by R. L. Weber, previously Megow's Midwestern representative, is now under the supervision of F.

Munson. It is rumored in Chicago that Fred Megow is backing the company. Don't be surprised to find Weber opening a swelligant hobby shop in the Windy City. (Russ Weber is now with West Town Hobby (Turn to page 53)



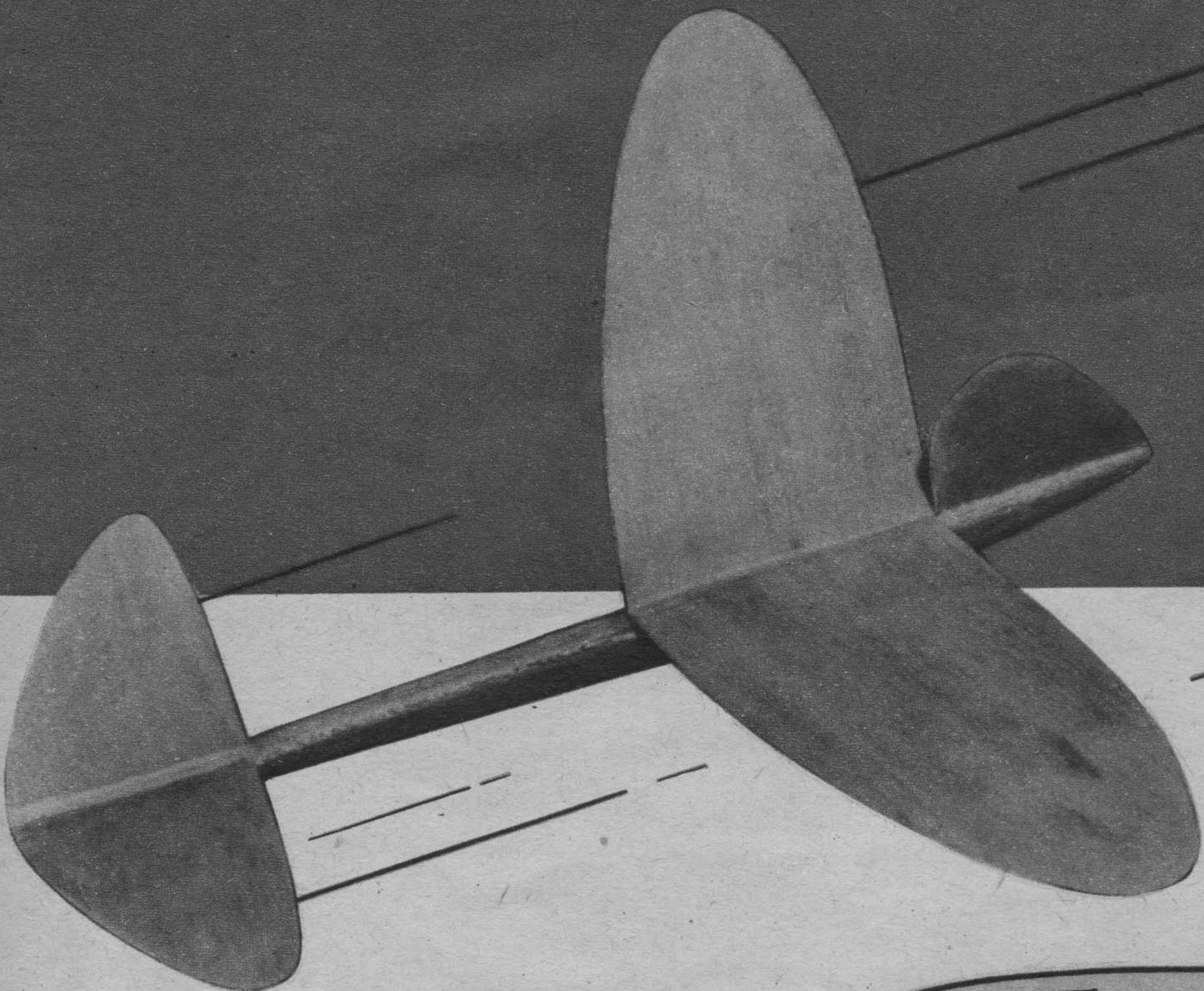
BY THE TRAVELING SALESMAN



## F-8





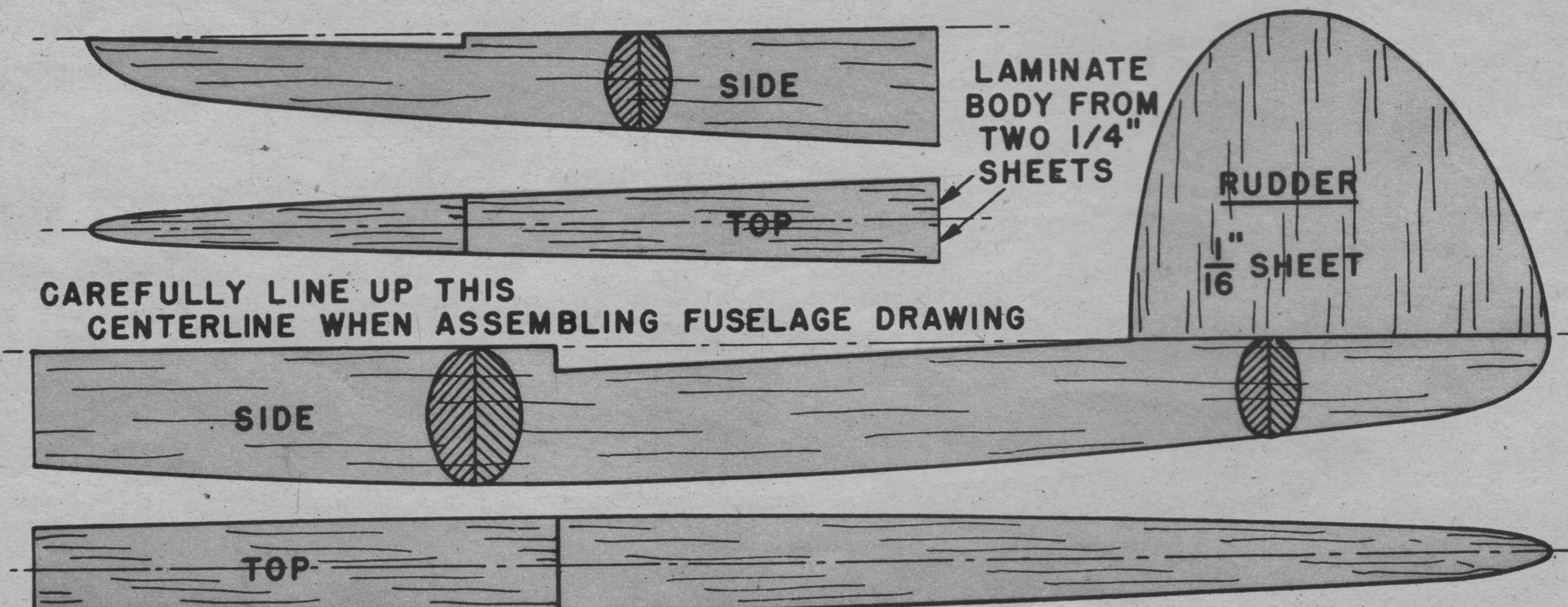
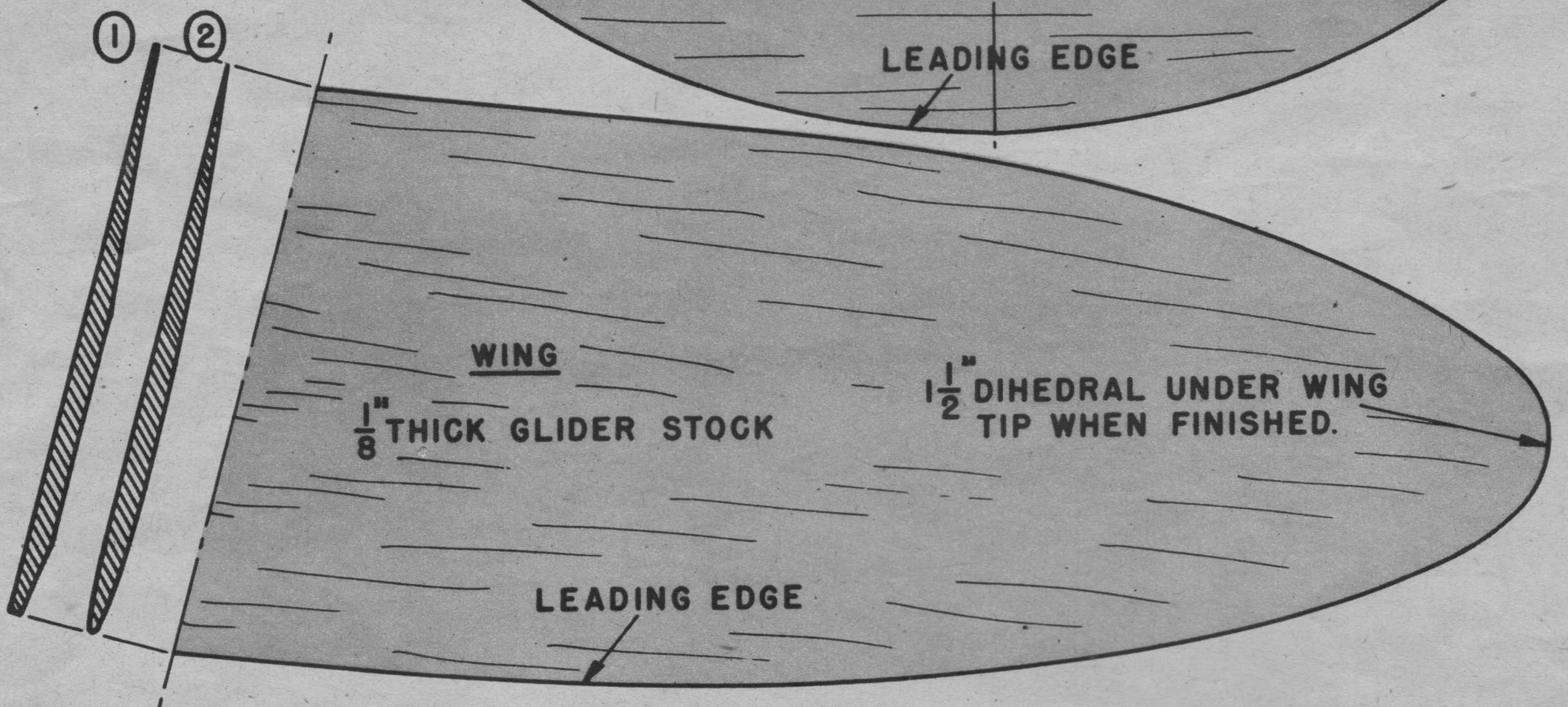
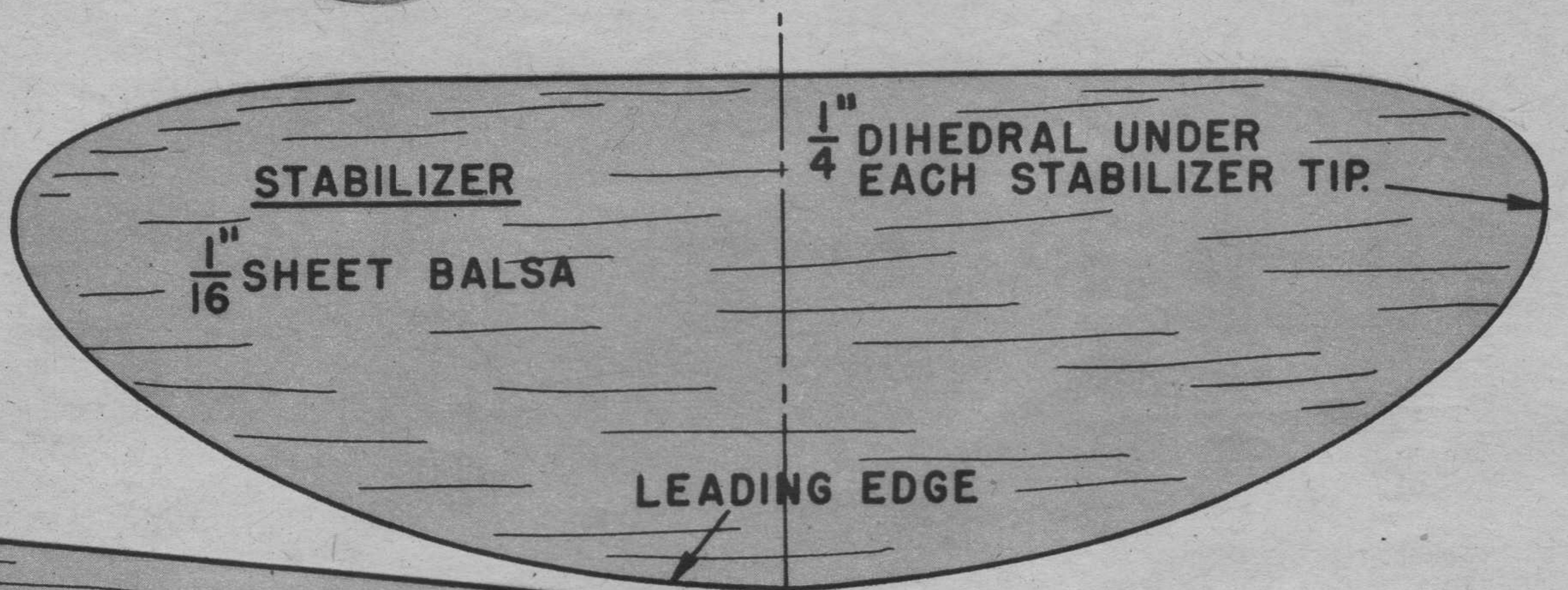


# SILLY SOARER

BY AL LEWIS

No, it isn't flying backwards.  
It's a sturdy tail-first glider.

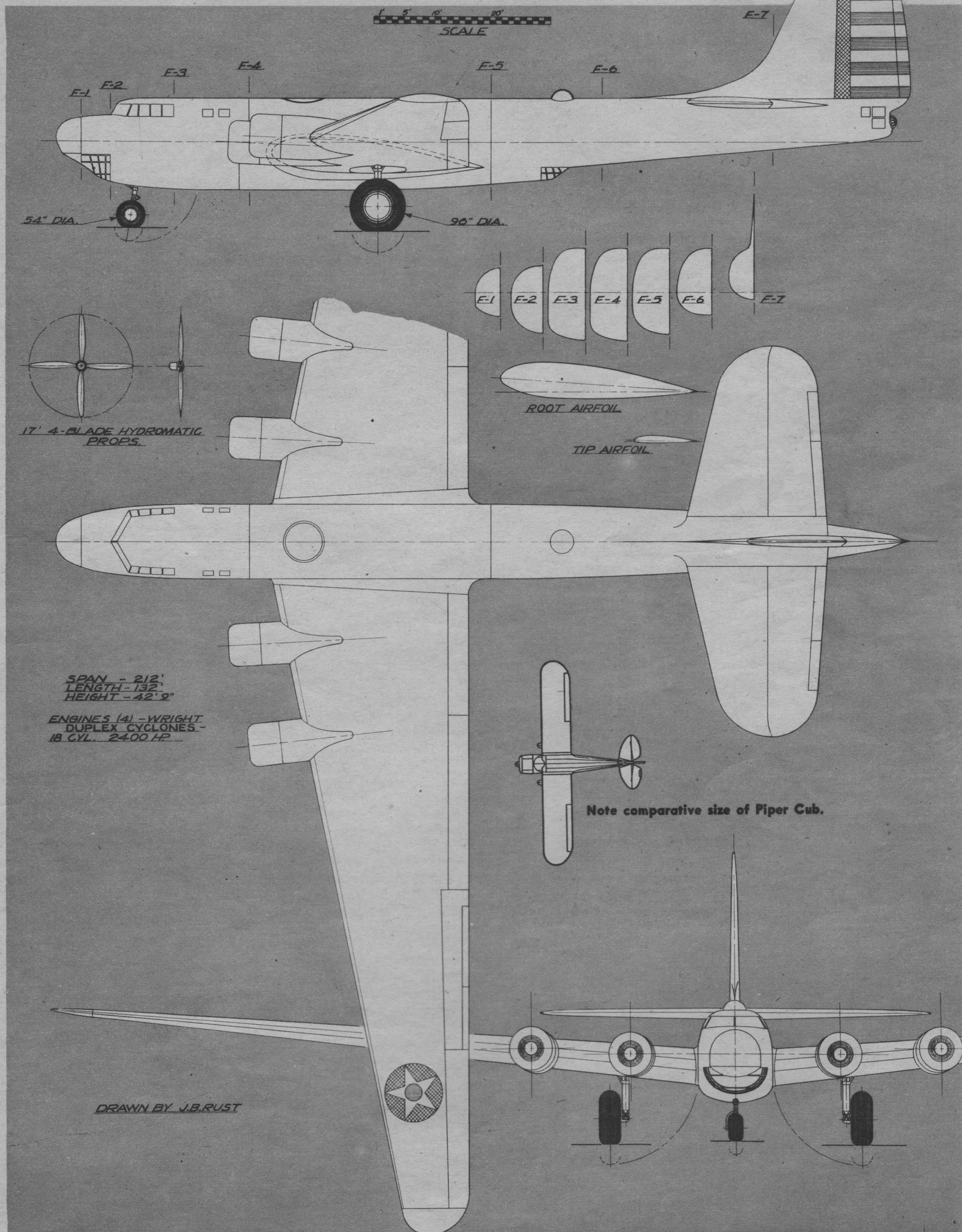
ALL PARTS ON THIS  
PAGE ARE FULL SIZE





# Hemisphere Defender—DOUGLAS B-19

BY J. B. RUST





# We Built The Giant Killer

(Continued from page 13)

arrangement, and establish their usefulness to an airplane as an improved tactical weapon, a number of perspective drawings were made. It was decided also to construct a simple mock-up of the engine and cockpit and to submit photographs of this mock-up to substantiate the claims we were making. Work progressed rapidly with the design and preparation of the data for the evaluation, but in the back of our minds persisted the question of pilot location.

From a study of the partially completed mock-up and other data it appeared that in spite of a small superiority in speed, the rear position of the pilot did not provide desirable vision for military operation. So, in the middle of the preparation of the design competition data, a second design was started, in which the pilot was located ahead of the engine—directly aft of the 37-mm. cannon. This required a ten-foot extension shaft instead of the five-foot extension shaft proposed on our other design. So, almost in the middle of the job the work to be done was doubled. The engineers and draftsmen were willing to try, and took another hitch in their belts and worked day and night, including Saturdays, Sundays and holidays.

In addition, it was decided almost at the last moment that sound movies of the two mock-ups explaining and showing the differences between the two arrangements of the pilot would be desirable, but the job of producing a complete 1,200-foot 16-mm. sound film was not easy. The pictures were taken after office hours by a company employee who was an amateur photographer, working with several of the engineers. The edited film was then projected on a screen and notes were prepared to explain it. The dialogue was written and read against a stop watch to coincide with the film. We then went to a commercial studio where the sound track was prepared. Then the sound track and film were sent to be transcribed on a single reel. To do this job properly and in less than three weeks, including time for shipment of the films to and from Rochester and New York, was a difficult task.

One final innovation in the design data had been concocted—an idea of a member of the engineering department to show the conditions of vision for the pilot. This ingenious device consisted of a spherical fish bowl into which was inserted at the center a tiny model of the proposed plane. The surface of the globe was then painted black to indicate areas blind to the pilot. The remaining unobscured area in the globe indicated the field of vision available to the pilot. When all the data was packed for shipment, we realized a suitable means must be found to ship the two glass globes. In a mild session of what has been referred to as the "old army game," we let the project engineer whose responsibility it was to see that the data was delivered safely to Dayton, carry the two fish bowls under his arms, much in the manner

that the old maid of tradition carries her bird cages.

And so, the data for evaluation of the design was sent, with all our hopes, to the air corps at Dayton, for judgment!

The evaluation required about sixty days. During this period no manufacturer's representatives were permitted to discuss their design with any member of the Evaluation Board, or to obtain information, or to act in any way affecting the judging. Near the end of the evaluation the companies which had submitted designs were invited to Dayton to appear before the board for questioning.

The evaluations were completed and our hopes fulfilled. We were advised that, of the four models competing, our design No. 4, in which the pilot was located ahead of the engine, was the winner!

Our design No. 3, in which the pilot was located aft of the engine, had received the second highest number of points. There was no further question about the desirability of vision for the pilot, since this feature had received first choice, and our old friend, the original single idea, the 37-mm. cannon, was the wheel horse for the job, since it was particular to our designs.

We were advised by the air corps that it wanted to negotiate an experiment contract for an airplane built to the winning design. This new airplane was to be called the XP-39. Several changes were to be incorporated in the experimental craft, principally items recommended by the Evaluation Board.

A new specification was written, called a model specification. It defined the design arrangement and exact equipment of the XP-39, down to the particular kind and size of electric light bulb in the taillight, and had nearly one hundred pages. This specification also was the basis for the speed and performance guarantee in the contract.

We returned to Buffalo and started at full tilt to prepare the construction drawings for issuance to the shop. About 2,000 drawings were needed to cover the details. Certain parts required more than mechanical drawings and drafting-board design to insure their suitability. A mock-up was built of the cockpit and the nose-gun installations, and a wind-tunnel model was constructed for the air corps to test. Another scale model, of balsa wood and designed in accordance with the requirements of the N. A. C. A., was made to determine the tail-spinning and stalling characteristics before construction.

Also, to design properly the tri-cycle landing gear, which was a new development in this type of plane, a structural steel test cart, a duplicate of the landing gear, was built and ballasted so that, when equipped with the wheels and brakes proposed, it had the same weight and distribution of weight on the wheels as in the proposed airplane. A universal set-up for the nose wheel was provided so that design dimensions and

angles could be varied to permit determination of the best arrangement.

This cart was taken to nearby airports and towed by an automobile on the runways at speeds approaching those of landing and take-off. Numerous tests were made to determine the controllability of the landing gear, satisfactory operation and functioning of shock absorption, and braking. This development work raised the problem of "shimmy" in the nose wheel. Several methods for correction of this difficulty previously had been worked out, but these didn't seem to do the job for us. It appeared that an auxiliary device of some kind was required to eliminate the "shimmy" if the landing gear were to be satisfactory, and to this end an antishimmy device incorporating a small hydraulic dampener was invented, which solved the problem and provided satisfactory operation without shimmy.

The engine in our new XP-39 was an Allison V-1710, normally equipped with a propeller reduction-gear drive, attached to the front end of the engine. The design and development of the extension gear box and an extension shaft ten feet long was no simple problem, but in the air corps contract these items were to be furnished by the government for installation. The air corps contracted with the Allison Engineering Co. to build two such units, one for test in the laboratory and the other for installation in the airplane.

Allison began designing the new power plant with all their resources, and Ron Hazen, chief engineer, personally laid out the extension shaft and independent gear box. Although the job was tremendous, Allison's experience in manufacturing the successful extension drive shafts for the propellers on the navy dirigibles, *Akron* and *Macon*, greatly assisted them. The Allison company designed the extension shaft so its natural resonant frequency would not synchronize with or reflect against the torsional deflections and vibration characteristics generated in the engine itself.

Finally, Allison developed a compact, small-diameter extension shaft with a satisfactory low-resonant frequency. Minor set-backs occurred from time to time on the engine, but no major trouble was encountered when the completed engine, extension shaft and propeller gear box were finally placed on the torque stand and tested to full military rated 1,150 horsepower.

In the meantime Bell Aircraft's own design problems were tremendous. One of the principal ones was to build the forward end of the fuselage, which supported the engine, extension shaft and nose gear box, so that the airplane would not react adversely under conditions of vibration and torsion placed upon it by the engine and propeller, even when these intricate loadings occurred in combination with the heavy air loads carried by the airplane structure during flight. Since the forward

end of the fuselage is essentially an extension of the engine crankcase, it was necessary that the research and study made by Allison for proper design of their equipment should not be wasted effort.

But the problem of vibration and engine torque was not the only one our engineers found in their preliminary layouts. The design arrangement with the pilot located ahead of the engine produced a high and unwieldy-looking fuselage, shaped like a large flat fish. From aerodynamic tests made on small wind-tunnel models, it was felt that such a large flat area so far forward might result in unstable directional flight characteristics, and it was believed necessary to reduce the height of the cockpit and the front portion of the fuselage.

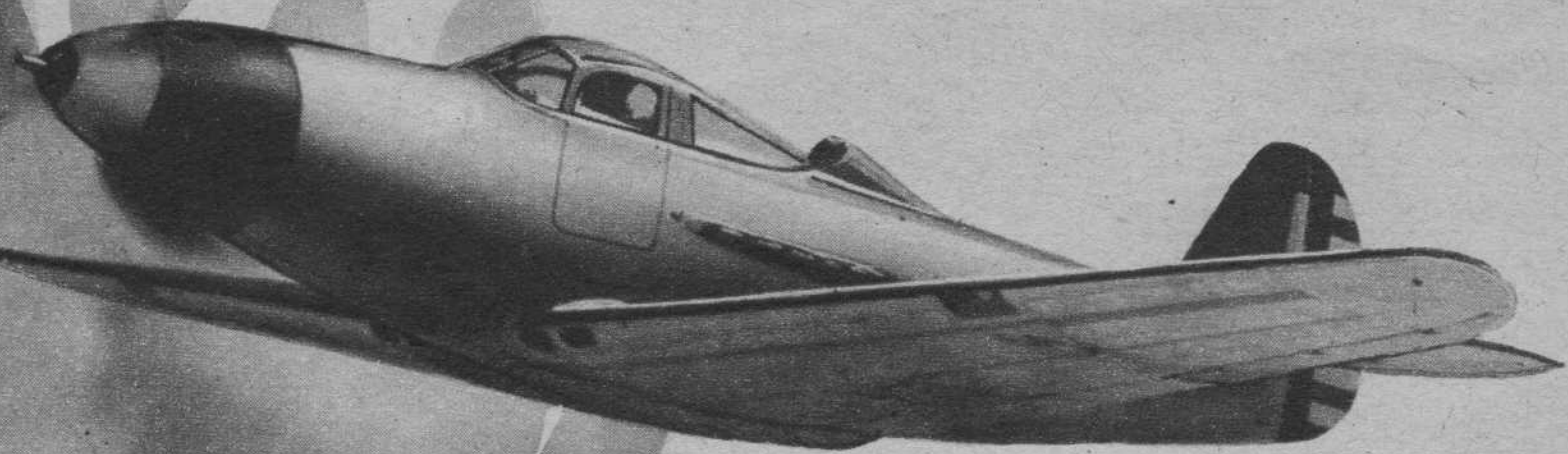
Many layouts to accomplish this were made to arrange the equipment and accommodations for the pilot and the full-time services of three of our best designers were needed for about a month to reduce successfully the overall height of the fuselage six inches and the length four inches. Such small savings in dimension may seem unworthy of the amount of time and effort required to achieve them, but it should be remembered that only by conservation of size and weight on many small items could the outstanding final results be obtained.

Another problem that required hours of study is now remembered as the "battle of the weights." The weight of the empty airplane, that is, the weight of the airplane less the crew, and the useful load it carries is a very important factor in any design. It measures, in a way, the excellence of design. The total weight an airplane can carry under a particular set of conditions is a fixed amount and is the sum of the weight empty and the total useful load. The limiting total weight, usually referred to as the gross weight, is limited by any number of design conditions; it may be landing speed or take-off distance or it may be wing loading for maneuvering in tight turns. But some circumstance always limits the total weight. It is obvious that the more the weight empty can be reduced, the more can be the weight of the useful load. And, since the useful load in the XP-39 included the pilot, armament and ammunition, and the fuel and oil, the advantages of any increase in useful load were obvious.

But reduction in weight of the empty plane is extremely difficult. In the XP-39, with a gross weight of 6,044 pounds, the useful load was 1,375 pounds. This left a weight empty of 4,689 pounds, but the actual weight within the control of the designers was less than 1,600 pounds. The useful load was specified by the air corps at 1,375 pounds and no change was permitted. After the engine, specified equipment and standardized parts had been taken out of the 4,689 pounds of weight empty, we had only 1,600 pounds for the wings,

(Turn to page 48)





# Cannon

## ON WINGS!



### AIRACOBRA!

The only single engine interceptor pursuit airplane in production in the United States that carries an explosive shell firing cannon. They are now rolling off our assembly line to join the fighting forces of Great Britain and the United States Army Air Corps. In quantity production, the Airacobra is convincing proof of Bell's leadership in design, engineering and construction.

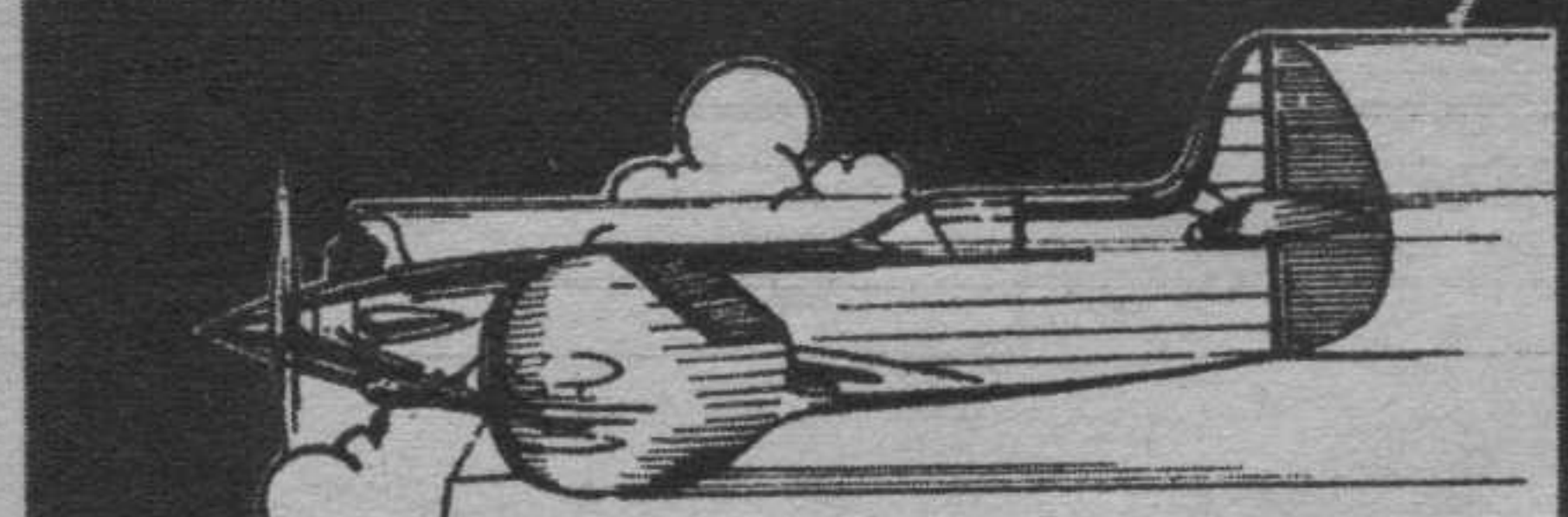


**BELL AIRCRAFT CORPORATION, BUFFALO, N. Y. • NIAGARA FALLS, N. Y.**

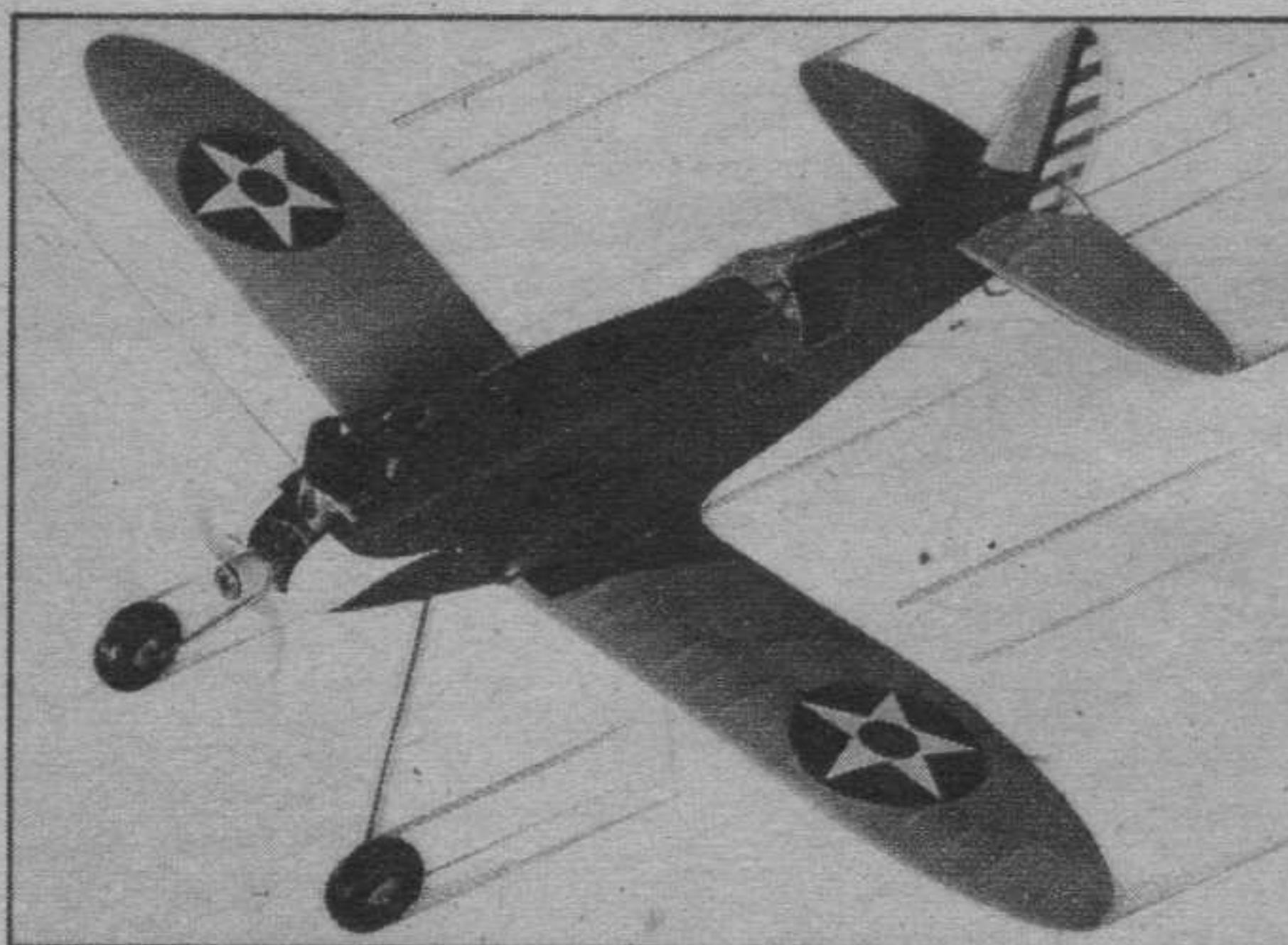


# "G" LINE FLYING

Sensational - New - Thrilling



FULLY PROTECTED BY U. S. PATENT  
SHARK P-60 "G" LINE MODELS



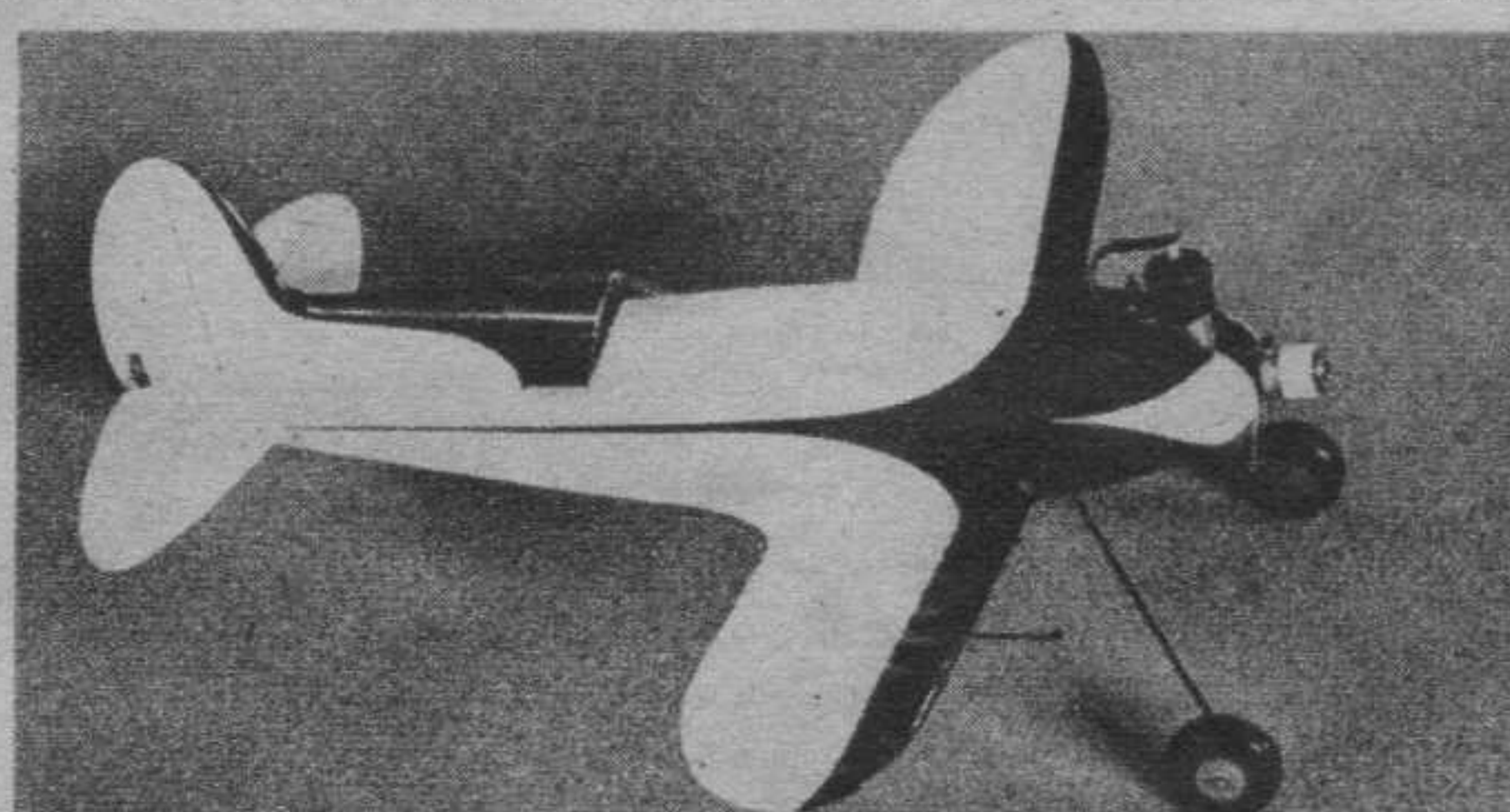
New Rubber Power Kit Two Gas Power Kits

Build and Fly one of these thrilling new ARMY TYPE PURSUIT "G" Line Speed Ships. All Kits are unusually complete throughout.

## Complete Shark P-60 Kits

Rubber Powered Kit Complete	For All Class A & B Motors	For All Class C 1/5 H.P. Motors
<b>\$1.95</b>	<b>\$1.98</b>	<b>\$2.98</b>
Postage 20c	Postage 20c	Postage 30c

BABY SHARK SUPER SPEEDSTER



The new BABY SHARK, Super Streamlined Speed Ship, is designed for all Class A and B motors. This snappy little job flies at tremendous speeds of from 50 to 75 M.P.H.

COMPLETE  
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TIGER SHARK SPEED DEMON



The TIGER SHARK, Super Speed Demon, is designed for all 1/5 H.P. motors. It roars through the air at unbelievable speeds of from 60 to 90 M.P.H.

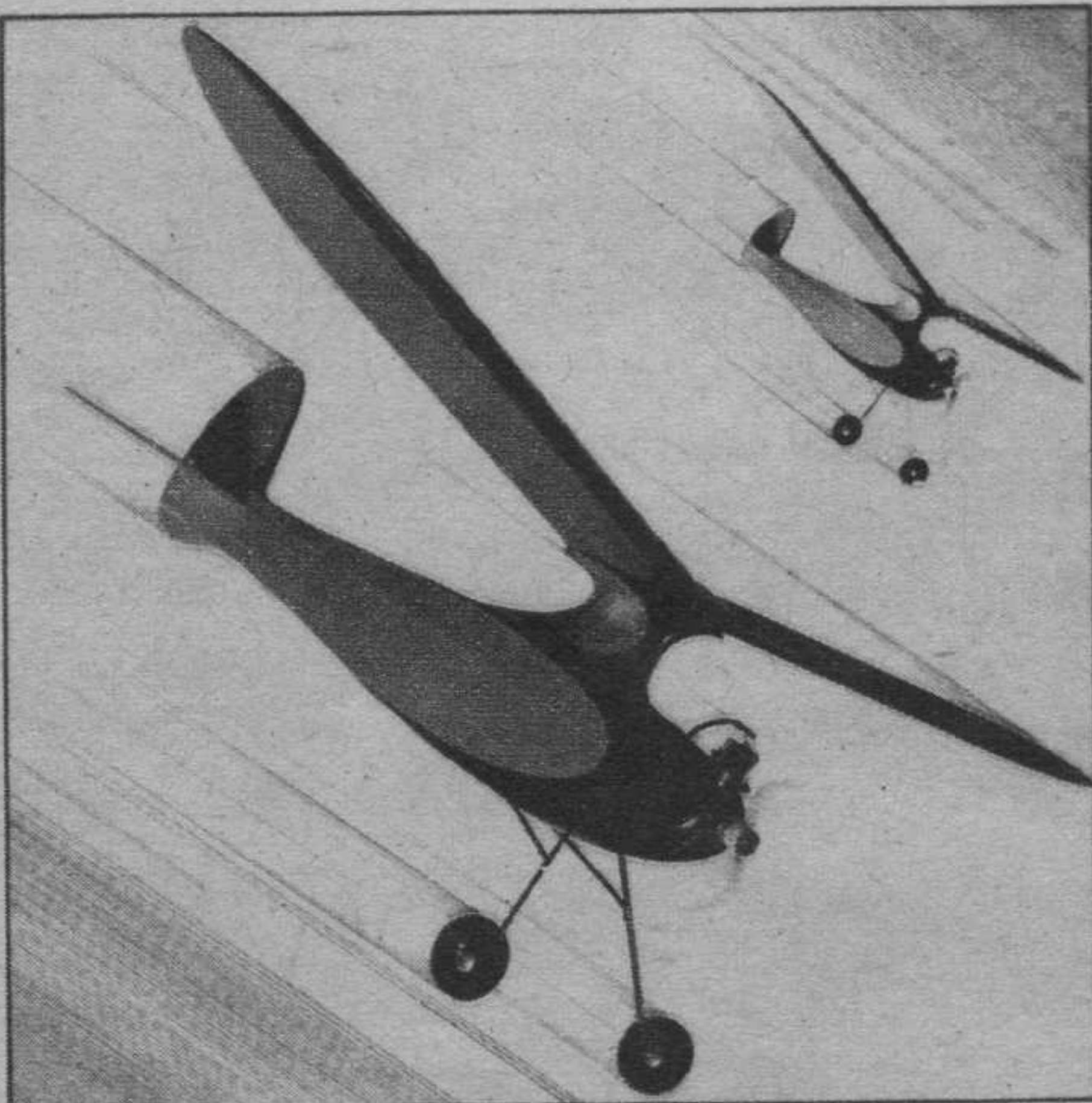
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## TEXAS RANGER

Combination Model  
The TEXAS RANGER is a combination model, designed for both "G" Line Flying and Free Flight. It may be powered with any Class "A" or "B" motor.

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**\$4.95**  
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INTERCEPTORS UP



Fly the Sensational New INTERCEPTOR, Class "B" Free-Flight Model. Super Performance in climbing and gliding. Our kit is Unusually Complete.

Kit Complete  
**\$2.98**  
Postage 30c

ORDERS FILLED PROMPTLY  
Dealers Write For Special Discounts.

**Victor Stanzel & Co.**  
Schulenburg, Dept. A. Texas

# We Built The Giant Killer

(Continued from page 46)

fuselage, tail and landing gear structure.

A comprehensive system of weight control was set up in which all of the detail parts were listed with columns opposite for recording estimated, calculated and actual weights, and a guess or "bogey" weight was assigned to each part. As soon as each part was designed, a calculation was made to estimate its weight. This figure was entered in a column beside the bogey and any difference noted. Where parts were under the bogey, the saving was noted and filed away for the inevitable rainy day when it would be needed. Where parts were overweight every effort was made to lighten them. If it appeared that overweight was accumulating in the detail design, the drawings of parts not yet released to the shop were again studied in an effort to recoup the weight loss. This ironclad system of bookkeeping on such an advanced type of design, which was based upon little more than opinions at first, was the cause of many long and sometimes heated discussions between various members of the engineering department and weight-control group.

Wherever possible, lighter materials were used, and magnesium alloy was specified for many nonstructural members, including seats, instrument panels, cabin parts, cowlings and fairing in place of aluminum alloy. This widespread use of magnesium alloy in the XP-39 was probably the most advanced effort made in this country to use this lighter material at the time.

The outcome of the "battle of the weights" was that the airplane was extraordinarily light, with a gross weight of only 6,044 pounds. This was a factor which contributed greatly to the outstanding performance of the experimental model and to our ability in later production models to add many pounds of weight in extra armament and equipment.

The battle had been won! The XP-39 was in flying condition with its Allison engine, ten-foot extension drive shaft, independent gear box, hollow hub propeller, 37-mm. cannon, tricycle gear and forward pilot position, all with a weight at least 500 pounds less than the standard single-seat air corps pursuit airplane.

The airplane assumed completed form. All of us at Bell Aircraft watched it grow from raw stock to finished airplane. Wings were assembled to the fuselage, the tail completed and attached, the landing gear installed and the engine bolted in place. Finally, the airplane was wheeled out for the ground running tests. It was taken to a secluded corner in our factory yard, with several heavy ropes anchoring it to the end of a railroad spur. The factory and office turned out in force to watch the show; the engine company representative entered the cockpit; the mechanics cranked the starter, and as we watched, she kicked over on the first turn! She ran as smooth as silk and purred like a kitten. Our many hours of hard work and anxious anticipation had been rewarded.

The run was continued for several hours, as the functional operations of the power plant, drive shaft and propeller were checked. No troubles were noticed other than a slight roughness in engine operation at idling speeds. Apparently the tests indicated no major difficulties. We thought, "The job is done, our troubles are over." Man, how wrong we were!

Because the XP-39 was built in secret, we couldn't fly and test it at a public airport, and so it was delivered in a sealed box car to an army test station. Our engineers packed their bags and briefcases, the mechanics bundled up their tools, and a small but enthusiastic delegation of Bell Aircraft employees took the night train to Wright Field. Upon arrival the little XP-39 was removed from the box car and assembled for its appearance before a selected group of army engineers. It was thoroughly inspected by the air corps to determine that all construction had been satisfactorily accomplished and that the equipment and power plant were functioning properly. Arrangements were proceeding smoothly for flight testing when the bad news broke.

The Allison people had been making extensive tests on an engine to trace the cause of the roughness noticed in the ground tests at Buffalo, and they discovered that a peculiar condition of torsional vibration occurred in the accessory drive end of the engine at idling speed which caused the engine to lose proper timing and caused extreme deflections in a small spring quill drive shaft in the engine. The airplane was grounded until this trouble was corrected. Such delay, due to trouble which occurred only at idling speed, would seem at first to have been minor, but after two weeks of engine testing, with Allison working night and day, all the long-stored-up nervous tension that had accumulated during the design and construction of the XP-39 at Bell Aircraft, Allison engineering and the air corps was vented in an effort to get the trouble eliminated. Strong words were used and there was great rushing about, but the problem remained unsolved.

After almost three months of night and day work by Allison's test engineers, the trouble was tracked down to spring resonance in the small quill accessory drive shaft. The inclusion of a simple hydraulic dampener on the quill shaft not only eliminated the trouble for all time, but brought a nice bonus of improved smoothness in the engine throughout its entire operating range. Changes required were quickly incorporated in the engine in the XP-39 and preparations made for flight test.

Bell Aircraft secured the services of an expert civilian test pilot, Jimmy Taylor, who taxied the airplane on the ground, made a series of short hops on the runways, taking off, flying a short distance a few feet off the ground and landing without turning, and then proceeded to put the plane through its first flight trials. He flew the craft for short flights on

successive days for about a week, and having fulfilled his contract, left the job of completing detailed routine flight tests to Homer Berry, our own test pilot. Tests were made to analyze the functional operation of all parts. This program was carried out, still under terrific pressure because of the promise the design had shown in its preliminary tests and because of the delay caused by the engine quill shaft.

Again trouble beset us. The airplane flew satisfactorily except that oil-pressure trouble developed. After a few minutes of flying, the oil temperature would mount rapidly and increase to more than the maximum permitted, accompanied by an alarming drop in pressure. The engine employed a new oil-pump design slightly different from that previously used on Allison engines. The oil cooler used was a type not then standard and the location of the oil-cooling ducts on the side of the fuselage were unconventional. One of these innovations was probably the culprit.

The problem was serious. The oil got too hot and the oil pressure dropped too low. Immediately clamor for the answer was directed at the little crew of engineers and mechanics trying to fix it. Everything within reason was tried. All our work to correct the oil problem was on the premise that the oil cooler was getting insufficient cooling airflow to do the job, and that, due to the resulting excessive temperature and the fact that certain other limiting conditions in the engine and oil cooler existed, this high temperature caused the resulting low oil pressure.

Greatly enlarged scoops were attached to the side of the airplane in an effort to induce larger quantities of cooling air to pass through the oil cooler and provide satisfactory operation. These scoops became enormous and all out of proportion to the sleek lines of the craft. The XP-39, our pride and joy, was dubbed the "Scoopacobra" and "Airaducta." Sarcastic names now remembered with a grin were not so funny then!

Finally we discovered the cause of all our oil trouble was a standard-type right-angle pipe fitting at the point where the oil left the tank to flow to the engine. This fitting had an extremely high restriction to oil flow and prevented an adequate amount of oil from reaching the engine pump. The engine pump, being of the gear type, had a positive displacement characteristic, and since the oil flowing to it was inadequate to meet this displacement, the pump pumped as much oil as was available and made up for the balance of its displacement by pumping air, so that only about one half the number of pounds of fluid oil needed was supplied to the engines. In other words, the oil supplied to the engine was half oil and half air!

A simple change at the oil-tank outlet made by unscrewing the standard right-angle fitting and welding in a smooth curved elbow of aluminum tubing solved this problem forever. But not before the engineers and me-



chanics again had heard a flow of strong words and lost a little more of their faith in humanity!

These two stories are typical of at least a dozen incidents which occurred during the design, construction and test of the XP-39. In every case the final answer proved to be simple, but at the time we didn't see the forest because of the trees.

After completion of the initial flight trials at Wright Field, the XP-39 was flown to Langley Field, Virginia, where it was installed in the full-scale wind tunnel at the National Advisory Committee for Aeronautics laboratory for tests to determine whether further improvement could be made in its high speed. In the wind tunnel the XP-39 was stripped of all external projections, and in the initial test consisted only of the wing, fuselage and tail surfaces. The cabin, the guns, the propeller and the landing gear were removed; the radiator ducts and openings were closed, and all external irregularities faired smooth.

The drag was then measured to determine the minimum drag of the general design. Later, various external installations were added to the plane, one at a time, and the drag of each measured. After completion of

these tests, the airplane was shipped back to Buffalo and the changes suggested by the N. A. C. A. were incorporated in the airplane, together with a new engine having a higher supercharger ratio.

The airplane was again taken to our airport, no longer a secret project, and thoroughly tested by our pilots and finally turned over to the Flight Test Branch of the materiel division, air corps. These men then flew the airplane to Dayton and made a series of tests to determine its speed, climbing ability, maneuverability, landing and take-off characteristics, engine operation, armament operation, radio operation—in fact, every function the craft or its equipment might be called on to perform. Even before the final flight tests were completed the XP-39 had shown its stuff to such an extent that eighty were ordered, and then more and more until now the Bell Aircraft factory in Buffalo hums night and day to build P-39 Airacobras in large quantity.

So ends the story of the conception, design, construction and the testing of a pioneer airplane, a worthy product resulting from the valiant efforts of a small group of men with confidence in their vision. Once an untried idea, today an important member of the nation's fighting force!

## Flivver Patrol

(Continued from page 14)

let us say, a DeHavilland Moth, which is the English equivalent of our American light airplane. It's powered with an 85 h.p. engine, two-place, open cockpit. We're probably stationed, not at an airport, but along the coast in some small town that has a hay pasture or a beach good enough to operate from. Every few miles all along the coast there's another group like us. We're given a small section of the coast line, say thirty miles long, which is our "baby." We're supposed to see that nothing comes in along that beach, that no submarines are prowling off the shore. We know that spies have been coming in with small boats, hanging onto logs, so we have to take a careful look at anything that's floating—if they're not spies they might be mines. That's where our light airplane comes in handy and where we have the advantage over the usual type of large long-range patrol bomber. We can spot something suspicious and practically hover over it to have a good look. Since there are lots of private pilots and lots of light sport planes in our country, there are many others patrolling the coast, too. Therefore, we can restrict our operations to a very small section of the shore line and do a much more thorough job of spotting any trouble.

Now let's see what happens when a little excitement develops. We have spotted a submarine underwater fifteen miles offshore. Since we don't carry bombs or fighting equipment, one will at first wonder what we can do. We don't have a radio telephone nor do we know the Morse code. All we have is the simplest kind of a transmitter and a telegraph

key in the cockpit. As soon as we spot the submarine, we start tapping the key, maintaining a continuous transmission. On shore things start happening. Along the coast at regular intervals are receiving stations with loop antennas. Our message comes crackling through and immediately bearings are taken on our position as we circle over the submarine, which, being submerged, probably doesn't even know of our presence. In an instant our location is established and an R. A. F. attack ship is in the air heading for the trouble. Properly armed, this ship arrives on the scene and takes care of the situation.

So successful has this type of activity been that over 200 persons trying to smuggle into England and Scotland have been spotted and caught, and a number of other types of enemy craft have been bagged. The fact that they're even using rotary-powered ships over twenty years old indicates the imperative necessity for this type of work and its tremendous usefulness. While this is an interesting story in itself, its significance to our country and to private flying is readily appreciated.

The east coast of England and Scotland is considerably more populated than large sections of the American coast line, particularly our Atlantic shore line. Nowhere in England are there long barren stretches as are found along the Carolina and Georgia coast. While long-range patrols are operating far at sea, activity along the coast, infiltration of the enemy is not impossible. To relieve the larger ships of coastal patrol could definitely be an excellent function for the thousands of privately



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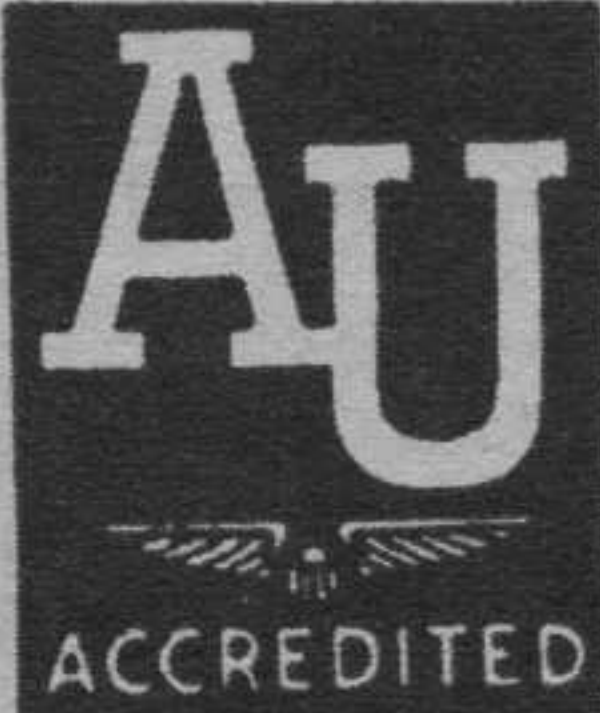
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owned ships in the United States and their pilots, who would instantly be well qualified for this type of work. Imagine how thoroughly a thousand light airplanes could blanket the Atlantic coast from East Port, Maine, on the Canadian line to Key West, Florida. No engines are more reliable than the modern-day light airplane engine. The cost of maintaining and operating such a fleet of "mosquito eyes" would be a negligible item.

As patrol ships of this nature, the modern American light airplane can probably not be equaled. Take any of them and you could put in gas tanks overnight which would give them a range of ten to fifteen hours. Despite the fact that they're single-engined, their proven reliability could even allow use for patrol one hundred miles offshore. After all, in wartime the life of a self-trained private pilot isn't much and the loss of a \$1,500 patrol plane is the equivalent of one meager salvo from a small cruiser. Give the pilots a little flotation gear, and a patrol system as thorough as this would locate the missing pilot and ship within twenty-four hours.

This is just one of the many uses for which small aircraft could be used in wartime. We stress the above use first because it has already had a precedent in England and has apparently proved itself of utmost importance.

Another of the many practical suggestions current at this time for light aircraft in naval work is being given considerable attention in Washington. The suggestion calls for the use of light aircraft in convoy patrol. Sounds odd at first, but here's how it would work: Tankers could be decked over as miniature aircraft carriers. The low superstructure of this type of ship would make the job simple. Several light airplanes would be accommodated on board. As the convoy proceeds across the ocean these light planes maintain a constant patrol of the whole convoy. Two or three light ships, which all together would cost less than one torpedo, could maintain a constant daytime patrol with terrific effectiveness. Sausage balloons were used quite often in the past to give convoys better observation against submarine attack, but think how much more effective a light plane would be, covering the area on both sides of the convoy for many miles. A normal tanker 300 to 400 feet long would be child's play to land on with a little air speed coming over the deck of the ship. Such a system would give a convoy tremendously improved protection and would practically eliminate surprise U-boat attacks.

tection and would practically eliminate surprise U-boat attacks.

For training, of course, the light plane will definitely take its place. Many military officials are in the same category as flying-school operators were five years ago. At that time they scorned the light plane as being below their dignity. Many of them fought the small low-powered airplane for a long time. The light ship just didn't seem like an airplane to them. But look around the nation's airports now and see how the light plane has proved itself, shown even the most skeptical hard-bitten pilot that first-rate fliers can be turned out in them, more cheaply and quickly. Already over 5,000 light-plane pilots have entered the army and navy. When the big push comes for getting a lot of pilots out in a hurry, the light plane will start 'em off.

But in still other ways the small airplane and private pilots will have a vital role in military activity. The Germans are reported to have used low-powered, slow-landing airplanes to demoralize Poland utterly. Small groups of these ships were landed all over that country with their crews cutting communications, disrupting rail service and sabotaging the defense. Many prominent leaders in aviation have even ventured the thought of using small airplanes the same as cavalry. Colonel Roscoe Turner says that 100,000 light planes, each armed with a 200-pound bomb, would make a nasty mess for any enemy. W. T. Piper puts it this way: "Which would you rather face—one wolf or a whole swarm of hornets?" You could shoot the lone wolf, but the hornets would be hard to knock down.

Light airplanes have been successfully used in experiments with the infantry and tank corps. At Camp Beauregard, last summer, a Piper Coupé and Cruiser were used for artillery spotting, troop liaison. Some interesting results were obtained. It was found, primarily, that the ships were a great deal more practical than sausage balloons, which have been used previously. It takes a crew of ten men to handle a sausage balloon and a lot of balloons on hand to send up after they've been shot down. The light ship is mobile and needs only inexperienced pilots who don't need the physique of a pursuit pilot.

The slow speed of these ships made them helpful for artillery spotting. While the battalion was on field maneuvers the ships hovered overhead and helped co-ordinate movements of various units. And when evening came and it was time to pitch camp,

the ships were landed along the road and parked with the camp. One officer remarked that it was a luxury to have the observation ships in the "back yard" and not seventy-five miles away at an airport, which is the case when regular army observation ships, which land at seventy-five miles an hour, are used. During these tests standard portable "walkie-talkie" transmitters and receivers were used. No special preparation of the ships was necessary for excellent radio reception and transmission. This fall additional experiments were carried out at Fort Knox with the tank corps. An amusing incident occurred when the commanding officer was notified that the two ships had arrived at the airport and were ready for use. The officer remarked facetiously that he'd like to see the ships, and the Cub pilots promptly flew over, landing on the lawn in front of headquarters.

In previous wars, horses and motorcycles have been vitally necessary for relaying messages behind the lines. All sorts of information, material, orders and the like have to be dispatched. Here the light plane in many cases could and should put the motorcycle out of business. The ability of a small ship to use unprepared fields, rough roads makes this possible. Take any light ship, add a few more horsepower, and you'll have something that will practically take off in its own length. Where landings and take-offs might be impossible, a pick-up system such as is being used successfully by All American Aviation for short-haul air mail could be simple to handle.

Taking another cue from light-plane practice, let's recall how recent endurance ships have been equipped. A bed has usually been placed behind the rear seat so that the pilots might sleep. There is all sorts of room for a reasonably comfortable bed and stretcher. Wouldn't these make excellent ambulance ships? With their ability to get closer to where they're needed and the fact that twenty of them could be purchased for the price of one twin-engine ambulance job, they make plenty of sense.

I guess I'm a light-plane addict of the first water, but I could write a volume on the private airplane in military use. No country has ever enjoyed or witnessed such a terrific volume of private flying or had available such an armada of private ships. These planes and their pilots have a lot to offer. What other country could ever rendezvous 1,400 private airplanes for a 1,000-mile flight such as was done this January by the Light Plane Cavalcade?

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## Record Flights

(Continued from page 24)

The temperature there was minus 40 degrees and even his warm flying suit did not protect him from the intense cold. Because of the cold and oncoming darkness he decided to terminate the flight. Ziller landed at Breslay Airport after being in the air 4½ hours, 44 miles from his take-off point.

### American Altitude Record (single-place)

Until July, 1939, the American altitude record lagged far behind the international. It was only 6,804 feet, made by Richard duPont in July, 1938, at Elmira, N. Y. True, higher altitudes had been reached in California by John Robinson, but lack of barograph and accredited observers made these records unofficial. Then during the Tenth National Soaring Contest duPont's record was broken no less than five times, all flights exceeding the height of 10,000 feet, until finally Robert Stanley established the new national record of 17,264 feet on July 4, 1939, flying his Nomad high-performance sailplane of radical design. Stanley took off at 1 p. m. by airplane tow from the American Airline Airport, located in the valley below Harris Hill. At 600 feet he released from the plane and found nothing but downdrafts for a while. Just as he was going to give up and land he encountered some weak lift which permitted him to climb to 800 feet. This lift gave out soon, and as he was getting ready to land once more he hit another thermal and rose to 5,500 feet. For three hours Stanley struggled to gain altitude in the weak upcurrents. At 4 p. m. he noticed that cumulonimbus clouds (thunderheads) had formed to the south. Having approximately 9,000 feet altitude by then, he started diving for the cloud, trying to reach it before its energy was spent. But it was too late. He flew only through rain and downdraft. Flying away from it he started looking for some promising young clouds, and about 4:30 arrived under one of them. His rate of climb gradually increased. At about 12,000 feet he flew out of the cloud only to meet more downdrafts. Breaking through he noticed that the cloud peak had assumed an anvil top usually associated with cumulonimbus formation. Above was a board canopy of ice crystals from which was falling a very light hail, similar to granulated sugar. Stanley headed into the center of the cloud column. At first his rate of climb dropped sharply, but as he approached the center of the cloud it rose to 15 feet per second. At 15,000 feet altitude the condensation began to freeze. At 16,000 feet it started to hail unmercifully and continued throughout the flight. Crouching low in the cockpit, Stanley stuck it out until his altimeter registered 18,000 feet. By then the Venturi tube actuating his turn indicator was iced up, the windshield became opaque and ice one-half inch thick covered the leading edge of his wings. Setting a straight course, he emerged from the cloud

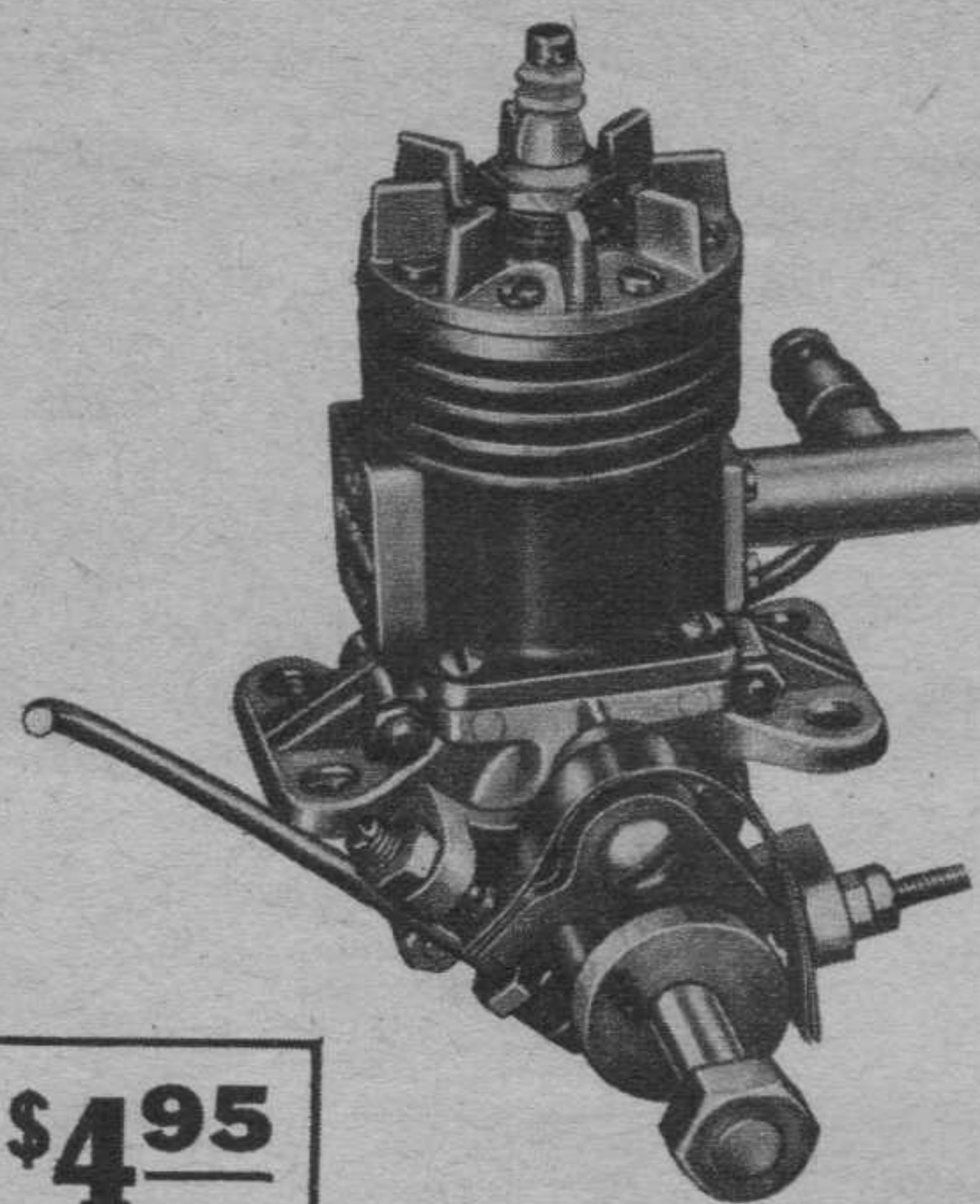
shivering and numb into the late-afternoon sunshine. The hail followed him for two minutes after leaving the cloud. Examining his sailplane, he noticed that some hail had penetrated through a crack in the inclosure and about an inch of hailstones covered the barograph shelf. The contour of the wing was so spoiled by the crust of ice that the stalling speed of the ship rose by ten miles per hour. At 10,000 feet the ice melted away from the glider, the instruments resumed their normal function and the ship became itself again. Stanley's fingers were blue with cold and he had to blow on them continuously to keep them warm. Cruising at an air speed of 40 miles per hour and sinking about 2 feet per second, it took him an hour and a half to terminate his flight, landing 80 miles from his original point of take-off.

**Editor's Note:** Just as we go to press, news reaches us that Henry Stiglmeier of California has beaten Stanley's national altitude record by almost 2,000 feet. Flying a sailplane of his own construction during the Western Championship Meet at Arvin, Calif., in April, Stiglmeier reached an altitude of 19,000 feet, establishing a new American record.

**Altitude Record (two-place).** Although two-place ships were built and flown prior to 1936, it was not until that year that the International Federation of Aeronautics (F. A. I.) recognized any multiplace records. As early as June, 1936, the American glider pilot, Red Slatter, with Passenger Batterson, flying a Buxton Transporter two-place sailplane, attained an altitude of 5,967 feet. In May, 1937, an official altitude record was established by two German pilots, Spigler and Hahenne, who reached 7,283 feet in their Kranich sailplane. In September of the same year two other German pilots, Ziller and Quadfasel, established a world altitude record when their Kranich rose to a height of 10,840 feet over Hartau, Germany. This record stood unchallenged until August 12, 1940, when Lewin B. Barringer, American Golden "C" pilot, carrying a passenger, attained a height of 14,100 feet in a Schweizer two-place metal sailplane over Sun Valley, Idaho.

Barringer and his passenger, Froelich, took off from Friedman Field, twelve miles south of Sun Valley, Idaho, by auto-pulley method. In the beginning of their flight they found only weak thermals and decided to land. While making the last turn preparatory to landing, Barringer noticed a lively "dust devil" starting up, and quickly dived for it. According to his description, the small whirlwind hit the ship with the force of a Mack truck. The climb indicator registered a rate of ascent of 16 feet per second. Keeping within its narrow but turbulent confines, the ship rose to 2,000 feet, drifting toward a mountain. Here Barringer and his passenger played along the slope lift of the hill, keeping their

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altitude until a newly formed thermal enabled them to gain some 1,500 feet more. At an altitude of 3,500 feet the thermal gave out, so, dodging downdrafts, they flew on looking for others. In the next one they rose to over 6,000 feet and drifted over the high peaks of Pioneer Range of the Sawtooth Mountains. Another thermal gained them 11,000 feet. Having reached an altitude which assured him of his Silver "C," Barringer decided to return to Sun Valley. But one-third of the way back they caught another strong upcurrent in which they rapidly climbed to an altitude of over 14,000 feet, which meant 20,000 feet above sea level. It was bitterly cold at this altitude, 15 degrees F. Losing altitude gradually, Barringer and Froelich landed back at Friedman Field, having beaten the German record by almost 4,000 feet.

**Distance Records (single-place).** The international distance record for a single-place is held by a Russian woman, Olga Klepikova, and was established in July, 1939, with a flight of 465 miles from the Tushino Air-drome near Moscow to Borisoglebsk. The ship used by Klepikova is known at Rot-Front 7. Olga Klepikova took off from the Tushino field at 10 a. m. on July 6th, being airplane-towed to an altitude of 3,300 feet. On releasing herself she gained another 1,000 feet in a thermal and set her course to the southeast. The clouds were comparatively few and they were spaced fairly far apart. To add to the difficulty, her course took her over a great expanse of forests, where thermal conditions are notably bad and emergency landings dangerous. Once clear of the forests, the going became easier, the sky was full of cumulus clouds and she was able to gain close to 5,000 feet altitude. Near Tamboff she attained her greatest height, 7,100 feet. But once more the clouds thinned out and she had to alter her course several times in order to keep going. Soon the sun sank below the horizon, the earth gave up its thermal activity, and having only 1,000 feet of altitude left, Klepikova landed in a nearby farm, having covered a distance of 465 miles in 8 hours and 25 minutes. It is interesting to note that since 1937 all international single-place distance records were held by the Russians. On May 5, 1937, the Russian soaring pilot, Victor Rastorgoueff, flying a GN-7 sailplane, established a record of 335 miles. On May 12, 1937, the same pilot broke his previous record with a flight of 374 miles, and on May 27, 1937, he again captured the world's distance record with the sensational flight of 405 miles.

We in the United States held an international distance record in 1934 when Richard C. duPont flew from Elmira, N. Y., to Basking Ridge, N. J., a distance of 158 miles, on July 25th. The next day Wolf Hirth in Germany captured Dick's record with a flight of 220 miles. After that we never caught up with the international mark. Lewin Barringer was the first one in this country to raise our national record above the 200-mile mark. On April 12, 1938, Barringer flew from Wichita Falls, Texas,

to Tulsa, Oklahoma, 212 miles, demonstrating the feasibility of distance soaring over flat country. On June 6, 1939, Woodbridge Brown of California bettered Barringer's record with a flight of 263 miles from Wichita Falls, Texas, to Wichita, Kansas, in a Bowlus Baby Albatross. And on July 13, 1940, John Robinson, present National Soaring Champion, flew his Ross-Stephens Zanonian high-performance sailplane a distance of 290 miles from Elmira, N. Y., to Mineral, Va., thus establishing a new national record.

**Distance Records (two-place).** As in the single-place distance records, so in the two-place, the Russians seem to have had a monopoly since 1937, when the Russian sailplane pilot Ilchenko with passenger Emerik covered a distance of 253 miles in the KIM-3 sailplane *Stakhanovetz*. The present international two-place distance record of 385 miles was established on July 22, 1938, by L. Kartasheff of Russia and passenger P. Savtsoff, in a KIM-3 sailplane between Moscow and Tchernigoff. Their total time in the air was only 7 hours, 30 minutes, which gave them an average of 51 miles per hour speed, probably one of the fastest soaring flights ever made.

The American distance record for two-place sailplanes is held by Robert Stanley, pilot, and Ernest Schweizer, passenger, who flew 212 miles on June 13, 1940, from Elmira, N. Y., to Washington, D. C. The ship used by them was a Schweizer sailplane, which was finished only a few days prior to the flight and had less than an hour of flying time. They had very few instruments on board and because of that, Stanley did not dare to enter the clouds, so most of the flight was made at a relatively low altitude. They had to fly over some very bad territory where a landing would mean a sure crack-up. And yet, thanks to Stanley's extraordinary piloting skill, the flight was crowned with success.

**Distance and Return (single-place).** This is the most dramatic achievement in motorless flight. It is rather hard to accomplish because the return flight is usually made against the wind. The feat consists of flying to a predetermined place and return to the take-off point without landing. In July, 1938, a German pilot, Bernard Flinsch, flying the *Darmstadt D-30*, a special sailplane built to determine the advisability of reverse gull wing and therefore having an adjustable dihedral wing whose angle from 10 degrees up to 25 degrees down could be adjusted in flight, and having an aspect ratio of 1:33, made an out-and-return flight of 191 miles between Bremen and Luebeck. On July 23, 1939, a Russian soaring pilot, Kimmelman, in a Rot-Front 7 sailplane, bettered Flinsch's record by making a distance and return flight of 212 miles. Kimmelman's record is until present considered as international.

The first American distance-and-return record was set by Richard

duPont in July, 1936, with a flight of 32 miles in a Goeppingen Wolf sailplane. In July, 1939, Chester Decker of New Jersey broke it with a flight in his Minimoa sailplane from Elmira, N. Y., to Hammondsport, N. Y., and back to Elmira, a distance of 40 miles.

**Distance and Return (two-place).** The international record in this category is held by Heinrich Huth of Germany, pilot, and Heinrich Brandt, passenger. They flew in a Kranich sailplane from Hamburg to Hanover and return, 186 miles.

**Duration Records (single-place).** The world's record for duration is held by Kurt Schmidt of Germany who stayed up for 36 hours, 35 minutes, August 3 and 4, 1933, in his Grunau Baby sailplane over Korschenruh, East Prussia.

The American record of 21 hours, 34 minutes was established December 17 and 18, 1931, by Lt. William Cocke of the army air corps at Honolulu, Hawaii. Lt. Cocke flew a Cocke Night Hawk sailplane which was nothing more than an early Bowlus Albatross somewhat beefed up by virtue of flying and landing wires. This was an international duration record at that time and stood unchallenged for almost two years. Attempts at duration records have since been abandoned by our gliding and soaring fraternity as they are considered nothing more than glorified "pole sitting" and proved only the ability of a pilot to stay awake for an unnecessary amount of hours. All duration flights are made entirely on slope winds, and as long as the wind blows up the slope with sufficient strength the ship will stay aloft.

**Duration Records (two-place).** The duration record for two-place sailplanes was established by two German pilots, August Boedecker and Karl Zander, in Rossiten, Germany, December 9 to 11, 1938, in a Kranich. The two lads stayed up for 50 hours, 26 minutes, thirty of the fifty hours being flown in darkness. According to their report they were so exhausted that during the last ten hours they fell asleep four or five times and woke up just in time to pull their ship out of a dive. Because of excessive exhaustion, now and then they saw great towering and ghostly shapes on the hill—which disappeared as they approached them. They had to take turns to fly as frequently as every three minutes.

No duration record for two-place sailplanes has been attempted in this country, and it is doubtful if it ever will be. We prefer to go some place instead of sitting over the same ridge for two days and more, without proving anything. And the scenery does get extremely monotonous after ten hours.

Unfortunately, space does not permit us to pay tribute to the achievements in motorless flight of the fair sex. They also have done a great deal toward the advancement of the sport.



## Let's See Spotts

(Continued from page 42)

M. B. Spotts Model Distributors is recognized as one of the leading distributors in the State of Pennsylvania.

Frequent mailings of advertising helps, and sales suggestions have been an important factor in building up that dealer business. Ben carries a large inventory, watches his lines closely, explores and follows trends and gives preference to advertised lines. Thus he is able to give his outlets forty-eight-hour service on a majority of items and his 450 dealers within a 300-mile radius are among his most steadfast supporters.

## "Don't Quote Me!"

(Continued from page 42)

Shop, 5727 West Lake Street, Chicago, Ill.

The basic price of balsa wood has gone up 20%. Add to this the fact that wood cutters are leaving for better-paying jobs in other industries and you can see what is going to happen to price in the model field. In the East the navy is getting the bulk of the balsa. . . . Aviation Products Co. of New York, former concessionaires at the Aviation Building at the N. Y. World's Fair, are going after the hobby business at army camps and airports. While \$21 per month is not much, most of it does go for recreation and entertainment. Distributors in vicinity of army posts are doubtlessly going after this business.

Barney Snyder became the bottleneck in his own plant when he jammed up production by a three-

Recently Dennis Cawley, formerly of Megow's, has joined the Spotts organization in charge of the rapidly expanding wholesale business.

The whole enterprise serves as an excellent example of what one man can do with foresight, hard work and courage. Mr. Spotts personally takes a keen interest in all phases of modeling and is known as a movie-camera fan. In this particular field he has a very extensive collection of films on model airplane manufacturing, building and flying, which have been pronounced among the very finest ever taken.

week stretch of jury duty. . . . Air Youth of America has authorized the Rogers KD49 engine which will be available to the trade with coil, condenser, and were decked out in an Air Youth box for \$6.95. . . . H. & F. Model Co. of Brooklyn is interested in closing out their 10 and 25-cent line. H. & F. is adding a 3 1/2-inch wheel to their Streamlite line to sell for 50 cents. Also a new Class A kit about July 1st. . . . Skyway will get out a new all-metal double-edged, nonslip knife with easily detachable blades of surgical steel, priced at 10 cents. . . . Saw two engine plants this month. Cliff Rogers in Philly and the Cannon Manufacturing Co., in Cleveland. Cliff dragged one of their engine kits right off the line, threw it together, and had it howling in jig time. Very impressive. Cannon has their B-300 at \$16.50 and the C358 at \$18.50. They have a very fine set-up for turning out quality motors.

Be seeing you.

## I Meet Baldy

(Continued from page 25)

about a pilot who had just set his plane down when a Stuka dropped out of the clouds and bombed it to pieces. They told stories about driving along the roads from airfields and having Messerschmitts dive down and machine-gun them. But the worst was the narrow escapes they had had in the cities while waiting for passage home, then being bombed in the harbors and again being bombed and attacked by submarines while on the return trip.

When I went to bed that night I realized for the first time just what a serious and dangerous job I had taken on. That night I dreamed of bombs and machine guns.

Next day we went out to check the ships we were to fly across the drink. Ours was a beautiful job, new, sleek. The motors were not so smooth and shiny as the ones I'd been used to on the air lines. Baldy explained this by saying it was because they were turning them out so fast for war service they did not have time to polish them up. "But they're all right," he said. "By the

time we get to Newfoundland we know whether or not they'll carry us across. When they blow they usually do it in the first two hours."

While Baldy and I were talking, a squat black-haired Russian came over. "What they going to do with this ship, Baldy? Junk it, or are they just going to junk the motors?"

"No," said Baldy, and he didn't sound exactly confident to me, "they're all right now. It was just a sticky valve that let Van down. They fixed it."

"What's all this?" I wanted to know.

"Oh, nothing," said the Russian carelessly. "I just thought they had given up trying this bus after its last failure."

"Aw, you punks make me tired," said Baldy disgustedly. "Ain't a damned thing wrong with these motors if they're handled right. The Professor and I'll get 'em through O. K. Won't we, Professor?"

"Just what in hell is wrong with these motors?" I asked.

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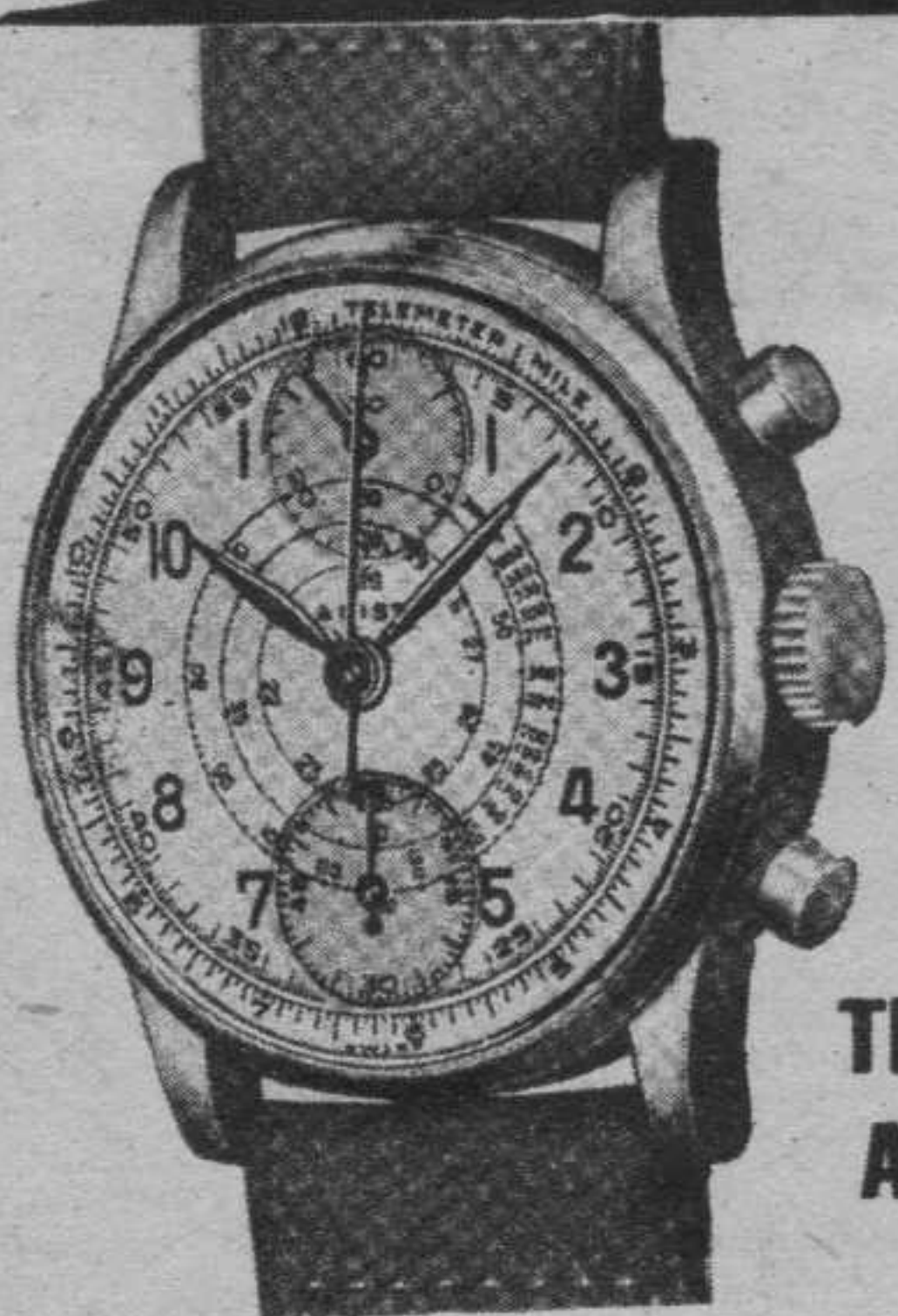
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"Not a thing," said Baldy rather hurriedly.

"Don't kid the Professor, Baldy," said the Russian. "Professor, this ship has made two trips out and her motors have conked both times. She's a hoodoo and someone's going to ride her west when they want to go east."

"Well, if you guys want to win the pool it's all right with me," said Whitey.

"What pool?" I asked. I hadn't heard about any pool.

"Just a party pool," Whitey explained casually. "Every man of the flight puts in ten bucks and we use it to throw a party to the ones who drop in the drink or get bombed. One of those things you've got to lose to win."

Whitey and the Russian walked away and Baldy cussed. "Don't worry, Professor, they're just trying to get our goats. We'll make it. No damned motor's going to let Baldy down in the middle of the ocean. Come on, let's give it the one-two-three."

If there was anything wrong with either of the motors we couldn't find it, and I know motors. One of the mechanics came over as we were warming up. He stood there for a minute watching and listening, then he shouted so as to make himself heard. "If you guys can locate it you're better than any mechanic on this field. It's just jinxed, that's all."

I watched Baldy rather close for the rest of the day. A couple of times I saw him come out of the hangar wiping his lips. I didn't like that but there was nothing I could do except watch like a hawk and in case he got too bad I'd just have to take over. I'd have liked to have a few hours on one of those bombers before taking off. That type was new to me.

We were to take off at seven. Just before that time a bunch of pilots, navigators and gunners came up and solemnly shook hands with Baldy and me. Baldy cussed them out but I held my peace. This thing was getting on my nerves but I didn't want them to know it.

First thing Baldy did when we got into the plane was to shed his 'chute. "Hell," he said, "'chute won't do any good over the country where we're going."

All the way to Newfoundland I watched the instruments constantly, but both motors behaved perfectly.

"Told you so," growled Baldy as we trudged through the snow to Hattie's Camp where we were to get orders and stay until our take-off for overseas. Orders came immediately. We were to take off at zero-zero time, for that would give us good flying time over the Atlantic and get us into Great Britain at the best time. Actual flight orders were given in sealed envelopes to be opened after two hours at sea.

Our ship was ticking over beautifully. Baldy was drunk. I saw him stow away two full bottles of liquor. I looked around and found a wrench and stowed it in the pocket of my flying suit. Pilot after pilot came over and again shook my hand as

though they never expected to see me again. If there had been any way to get out of this flight with a drunken pilot I'd have taken it, but I was stuck. The heavy flying suit was almost unbearably hot. I wondered if Baldy actually got any strength or comfort out of his liquor. I wondered if I had made a mistake in never learning to drink.

The runway was covered with snow, but rolled hard. Baldy gave her the gun. Slowly we maneuvered out onto the mile-long stretch. Baldy goggled over at me stupidly. "See if the tabs are set, Professor. I'm not sure whether I set them for landing or a take-off."

He'd set them for a landing, all right. Hastily I corrected the mistake. We lined up on the runway. Ahead of us a bomber was taking to the air, its lights twinkling through the light snowfall. We started to roll, faster, faster. The tail was up. I felt the surge of her trying to lift. "Roll up the wheels!" Baldy shouted at me and I knew he was drunk because the wheels were not yet off the ground. I put my hands on the lever and Baldy heaved on the controls. We were off and I started the wheels up. Crazy as it all was, we'd made a perfect take-off.

We climbed steadily until we were over the overcast, then Baldy held her on a compass course. As far as the rest of the flight was concerned, we were all by ourselves.

Steadily we bored through the night. It was clear and cold up where we were. Below us I could see billowing clouds. The outside thermometer registered twenty-five below. I felt listless, sleepy. Baldy looked over and said, "Better take a shot of oxygen." I put the tube in my mouth and turned the petcock. Almost at once I felt better.

Two hours passed. Deadly monotonous hours. Back of us the navigator was busy taking sights on stars and checking our position and sending our position and sending code reports over the radio. Baldy reached down and took a long drink from his bottle, then he turned to me. "Take over, Professor, while I look at the orders."

He ripped open the envelope. I heard him cuss but I didn't get to find out what about for just then the left motor coughed a couple of times and cut out, cold. Baldy worked like mad, checking instruments and doing everything he could. No soap—that motor had let us down for good.

"All right, Professor," shouted Baldy. "Turn her around and head for home. Hey, Bill!" he yelled at the navigator. "Pass the word we're heading back, motor trouble. Get a radio set and keep in contact. Thank God we've plenty of altitude!"

It was a hard job to hold the bomber level with only one motor. Sweat was running down my forehead in spite of the freezing temperature. I made the turn and headed back on the compass course the navigator gave me. Suddenly down below a blinding light broke out, then another, blue this time, and then a third, brilliantly red. Baldy came forward again. "How'd you like it,

Professor?" he gurgled drunkenly. "All same Fourth of July, no? Wait, I've got another, a beaut."

He had one of the glass balls filled with aluminium in his hand and another red flare. He was tying them together with a string. The glass balls were used by the navigator to get a sight on the water, to establish drift and airspeed. When dropped the fragile glass would break and spread the aluminium over the water where it would reflect back like a mirror. Baldy tossed out the flare and the ball. The red light reflected against the clouds below. Suddenly it seemed as though the whole sky was lighted with red fire. I figured the flare had somehow ignited the pound of aluminium. I almost dropped into a spin that time.

After that I'd have given almost anything to have had Baldy take over the wheel again, but he seemed to have other things on his mind. Next time he came forward he had a bottle in his hand. He had put on his parachute and over it a life preserver. I wondered if he was drunk or just plain crazy. I didn't have much time for him. I was having plenty to do keeping the nose up with only one motor. After a while the navigator came forward. "Better start her down," he said calmly. "We can float in from here if you want to."

Baldy sent several more flares floating earthward and then suddenly we came through the clouds, and there before us was the field, reflected in the light of the flares and with its hundreds of ground lights marking the runways.

"All clear to land," sang out the navigator. "Set her down, pilot."

We were headed straight into the wind and the rest was easy. Mechanics rushed out and held our wings. Suddenly I felt all the confidence in the world. I'd brought her in in spite of that drunken Baldy! I decided that was the time to take a drink. I put Baldy's half-empty bottle to my mouth, took a swig, choked and spit it out.

It was cold tea.

Baldy was the first out. The C. O. slapped him on the back. "How's everything, Baldy?"

Baldy reached over and in turn slapped me on the back. "Everything's jake-a-loo," said Baldy, surprisingly sober. "The Professor kept his head, brought the boat in and even took a drink of my cold tea. He'll do to take along when we take off in the morning." And Baldy and the C. O. doubled up with laughter.

That was that. I felt silly at first, but in the mess at Hattie's Camp the other fliers—none of whom had actually taken off for overseas—gave me a roaring welcome and I really did take a drink of Scotch. I guess I realized these men, pilots, navigators and gunners from the four corners of the world, had a right to know about the men they flew with on dangerous missions. If a pilot passed the test with Baldy he was passed into the inner circle. I think Baldy should have been an actor, but tomorrow I'm flying the Atlantic as his copilot, and proud of the prospect.



## Student Gets Job

(Continued from page 18)

you're a naturalized citizen, naturalization papers must be produced.

In all events fill out the questionnaire completely before you apply for employment or interview, and be accurate. Misinformation is not only warned against, as you will note, but will be the cause of instant dismissal if discovered and will work against you in any future application for employment in the whole aviation industry.

Now you've filled out the application and sent it in. At last a reply comes granting an interview in person at the plant. Wait a minute, don't go tearing off in sweat shirt and slacks to sell yourself to the interviewer. Dress neatly and cleanly—be presentable. As smoking is prohibited at most plants, leave the smokes at home to avoid possible reprimands from attendants.

You arrive at the plant and find several other young fellows waiting, too. They're as nervous as you are—but that doesn't help much. At last your name is called. Gosh, here it comes! You start for the inner office, hands moist with perspiration, wishing you'd given your shoes another lick with the cloth.

Inside you find a competent-looking gentleman behind a desk, busily engaged with some papers. He looks up with a smile, and says, "Will you sit down, Mr. Jones? I'll be with you in a minute."

Say, maybe this isn't going to be so bad after all! You lose some of your nervousness and immediately get it back as he picks up your application form.

With the first few questions aimed to put you at your ease, the interview begins. The same questions answered on the application are asked you in person with a few others added as he seeks to draw out any information that might have a bearing upon your suitability for the position in mind. When asked about your citizenship you produce your proof in whatever form you have it. (Incidentally, baptismal certificates, school census records, and so forth are *not* valid proof of citizenship and should not be submitted as such.)

Apparently satisfied with your answers and proof of citizenship, your interviewer picks up a phone and calls a man in from the plant. This department foreman, for such he proves to be, escorts you through a maze of clanking machines run by young chaps like yourself as well as older men who look at you with a smile as you pass. Who knows? You, too, may soon be running one of these, for did not they at one time walk down this aisle feeling as you do now?

Your companion steers you to a comparatively quiet corner of the shop where he questions you regarding various tools and equipment lying about the bench. Satisfied that you really know tools, metals, and techniques, he asks you to do a sample drilling and riveting, for example.

You select the proper equipment

and metals and go at it. Don't rush this, for you'll be given as much time as is normally needed for such a problem. Your foreman knows from experience that you are nervous and excited and will make allowances for time—but not for inefficiency. This brings to mind one incident that happened to an applicant in your exact circumstances. He did not see the proper fitting for a tool and rather than ask for it went ahead with what was at hand. Afterward in a test of the joint it failed, and he was not accepted for the job. In talking with the foreman about why the piece failed he was told he should have asked for the right tool rather than have gone ahead with the improper fitting.

If you pass the tests indicated by the foreman in spite of clammy hands, nervous fingers and possibly shaking knees, you are all set for work. You are escorted back to the interviewer's office and dismissed by the foreman with a smile and a curt "He'll do."

Now the interviewer asks a few more questions, hands you papers to sign regarding the truth of various statements, and a card to report to the company doctor for a complete physical examination. Past this barrier, you are given a button and identification pass showing your right to enter the plant and your department, and told to report for work the following morning at 7:45.

You've made it! Walking slightly unsteadily you leave the plant greatly tempted to slap the first person you meet on the back and tell him all about it. Gosh, it's a great world after all!

Now that you have the job, what are you going to do with it? That's another story in itself, but here are a few tips about what you should have to work with and in.

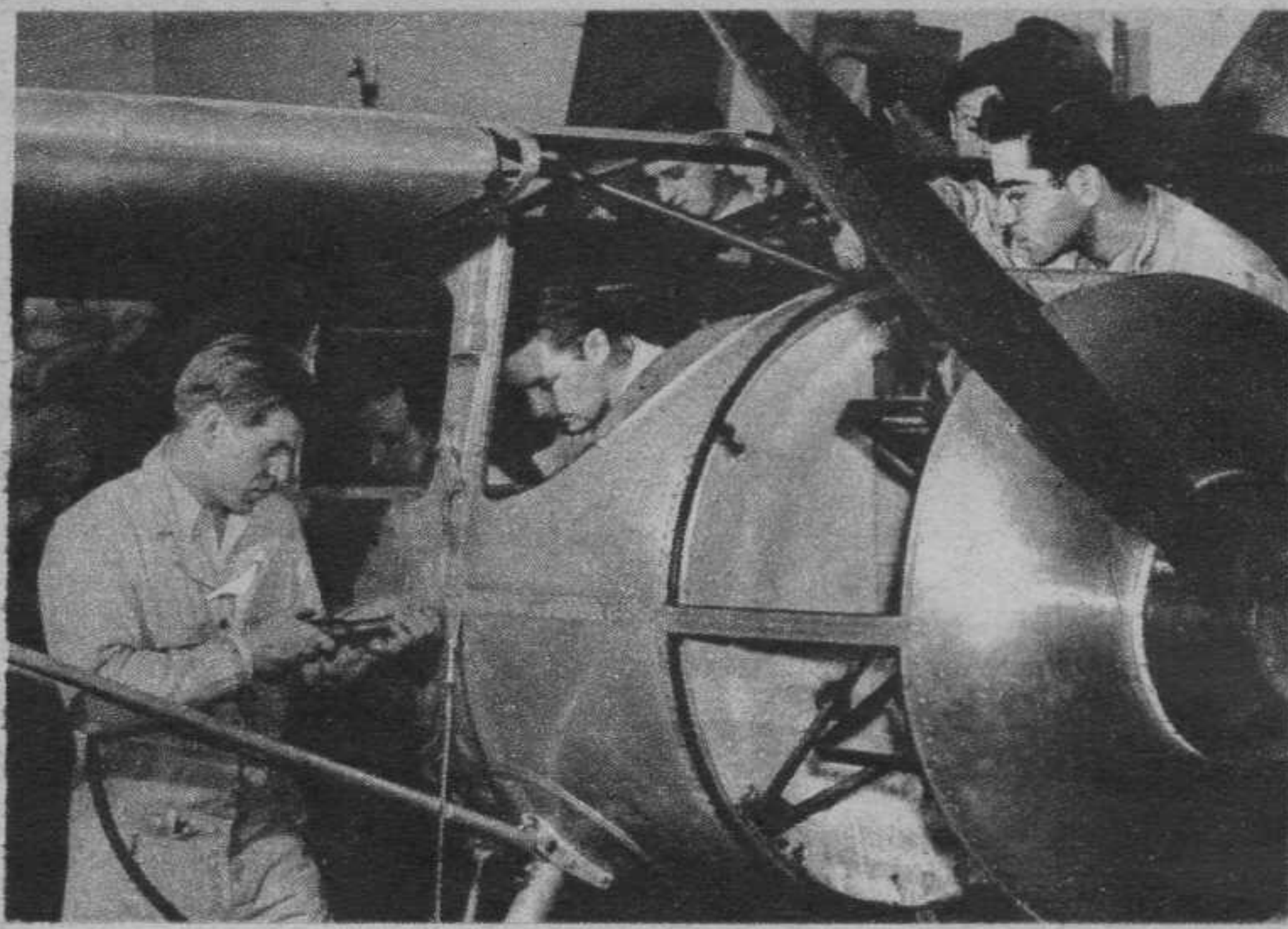
In the way of tools, you should have your own standard tools such as scales, wrenches, calipers, hammers, gauges, et cetera. These should be kept in a lockable metal tool box with your name on it for safety. Certain special tools required by that particular plant will be furnished. If possible, all tools should be marked with your name or initials in case of loss or theft.

As to dress, the one paramount factor is safety. Perhaps you have noticed the lack of neckties about manufacturing plants? That's a result of safety campaigns against dangling ties, shirt cuffs and loose shoelaces. A chap was in my office only the other day telling of a brass button he still has that came from a coverall cuff caught in the gears of a lathe. He got his arm out just in time, but the sleeve and button went through the gears. That button, now a nice corrugated piece of brass, could have been his wrist.

From now on it's up to you. Good luck, and remember that an employee is a representative of his employer and his product. Keep your company's trademark famous!

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The fact that the President of the United States has requested that all defense industries work on an 168-hour a week basis is conclusive evidence that thousands of aviation sheet metal workers will be required within the next few months.

President Jouett, of the Aeronautical Chamber of Commerce, recently estimated that 170,000 additional men with this type of training will be required before the end of the year!

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... The shops cover more than 30,000 square feet of floor space, and a staff of twenty-five experienced instructors gives individual attention to each student. The theoretical part of the course, including blueprint reading, applied mathematics, and the use of precision instruments, is given on a practical basis during the progress of the student through the various steps of his shop training. . . .

... After the student has mastered the cutting, forming, drilling and riveting of individual parts, he is advanced to assembly work. There he learns the construction and installation of the fuselage, wings, ailerons, stabilizers, rudders, elevators and floats. Landing-gear assembly and installation of control hook-ups, fuel, oil and hydraulic lines with hose connections, and fittings, are also fully covered. . . .

... The course which has earned the approval of airplane manufacturers was planned and is personally supervised by E. N. Whittington, former Principal of Curtiss Aviation Division of Curtiss-Wright Corporation and Bell Aircraft Corporation Airport Training School of Buffalo, N. Y.

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- 1—SYNCHRO MOTOR KIT COMPLETE WITH COIL AND CONDENSER
- 2—MERCURY "BULLET" GAS MODEL
- 3—GAS PROP
- 4—HYDRAULIC FLIGHT TIMER
- 5—BOOKLET ON MOTOR REPAIRS
- 6—RUBBER GAS WHEELS
- 7—TWO BATTERIES

48" Wingspan, 14 oz. Weight (with wheels and prop)  
Climbs like a sky-rocket. A thermal catcher if there ever was one. Designed for small bore engines. Kit is complete with alum. Cowled nose, Wire, Cement, Dope, Celluloid, Tissue, Balsa strips, cut to size, full size plans and printed sheets, etc. Price of kit, if bought separate. . . . \$1.50 P.P.

Send 3c stamp for latest catalog of motor, kits or supplies. Dealers write for discount.

MERCURY MODEL AIRPLANE CO. 159277 LINCOLN PL. BROOKLYN, N. Y.

## "AIRFLOW 40"

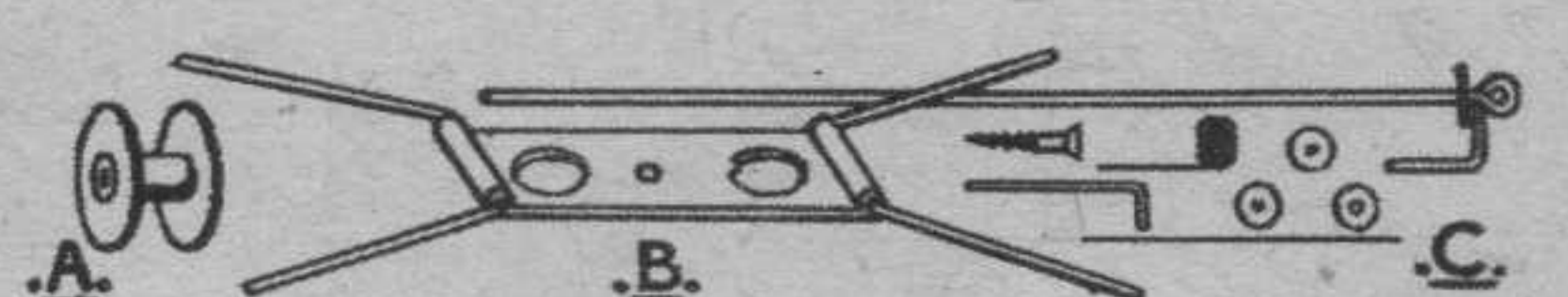


WING SPAN 40" LENGTH 30"  
WING AREA 200 Sq. In. WEIGHT 6.14 Oz.  
RATE OF CLIMB 1450 FT. PER MIN.  
GLIDE RATIO 13 TO 1

Finished — Wing Ribs, Saw Cut, Not Die Cut.  
Finished — Wing Spars, Cut to Length and Tapered.  
Finished — Leading and Trailing Edges on Wing.  
Finished — Nose Plug Assembly Parts.  
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New — Balsa Shells, Tapered and Shaped, Finish off Nose of Ship, instead of Tricky Former Work. Easy to Cover. Absolutely Crash Proof.  
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Giant Plan 35"x45".  
Ball Bearing Washer. Fresh Brown Contest Rubber.  
NOTHING ELSE TO BUY  
Streamlined wheels, dope, cement, tissue, balsa, etc., etc. \$1.75. STANDARD KIT \$1.00 only. Add 10c Postage; 15c West of Miss. River and U. S. poss.

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STREAMLINED BALSA WHEELS (MED. HARD) 1 1/2"; 1 3/4"; DIAM. 3/8" THICK 10c pair  
RETRACTABLE LANDING GEAR (single). Completely finished; 1/16" music wire hard soldered, 2 bronze bearings, special gusset plates; instructions. State width of fuselage and length or make of ship —25c comp.

COLLAPSIBLE BOBBIN put on after shaft is bent to exact shape—adjustable. Beats old type, saves rubber—10c. STANDARD BOBBIN .06c.

PROPELLER HINGES state shaft diameter, width of hub, length between hinging points. Designed to rest blades snugly to fuselage. Popular sizes 3/8"x2", 1/2"x1 1/4", 3/4"x1 1/2", or any size. Single 15c. Double 20c.

RUBBER TENSIONER AND PROP SHAFT .040—10c; .049—15c; 1/16"—20c

SEMI-CUT PROP BLOCKS designed to give maximum thrust of rubber—1c per inch plus 8c

TENSION SPRINGS .014-.020—4c ea.

FREE POSTAGE. Packing cost on all orders 10c. 15c west of Miss. R. U. S. Possessions add 15% of order to packing cost. (NO STAMPS.)



## Model Matters

(Continued from page 27)



Ohlsson 19—\$14.50  
Ohlsson 23—\$16.50  
Ohlsson 60 Custom—\$21.50

New methods, machines, and plants are producing finer, faster aircraft. Everywhere the cry is not merely for "production," but for better production . . . better performance of ships and motors.

Designed by Ohlsson, engineered by Ohlsson, built by Ohlsson, Ohlsson motors are also planned for performance. No farming out of vital parts. No dependence on outside suppliers for special engineering. Today's Ohlssons are successors to the motors that "made modelers build cleaner, faster ships" to handle the Ohlsson standard of model engine power. Every motor is micro-checked in 76 important places before being passed to the assembly room.

The 1941 Ohlssons are smoother, tougher, and engineered to the closest tolerances in the miniature engine industry . . . designed to uphold the Ohlsson motto: "The records are made with Ohlssons."

### BE A 3-WAY CHAMPION WITH 3 OHLSSONS

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P. O. Box 2324 Terminal Annex  
Los Angeles, California  
Mail this coupon or send postcard for Ohlsson & Rice  
"Precision Control" Folder.

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rubber contest at Linden, N. J., July 27th.

Clem Shriver of Massillon, Ohio, built the Simplex gas job from plans in the February, 1941, Air Trails. Early in April he tested the job on Akron Airport. The first flight was nothing more than a short test hop to check the glide. The second was much the same. On the third he cut loose and opened the motor to three-quarter and set the timer for 15 seconds. A three-year-old "23" dragged the Simplex up by the nose and it didn't get back until 37 minutes later with a ten-mile flight to its credit. Two days later from the same airport the fourth flight with less power and shorter run was timed at 7 minutes. Clem quit flying because he didn't want to lose the model too soon. He did some arithmetic and figured the average of the first four flights in the model's life was 11½ minutes. Needless to say Clem is sold on Plecan's work as perfect for pleasure or contest flying for beginner or expert. Many of the boys agree with his contention that Simplex is one of the best designs on the market.

The energy of some model builders knows no limit. Dale W. Root just finished his first year at Knox College, Ill. In addition to his school work he whipped up two gas models. Now when I was in college three of us did the same thing with the important exception that when the two activities conflicted the school work suffered. Once we cut a chemistry lecture for some early-morning flying fully intending to get back in time for a second class. The inevitable one-more-flight-and-then-we'll-go-home was our undoing. The ship landed in a pine tree and required several hours of skillful maneuvering to bring down in one piece. We barely made the first afternoon class.

Spectators are the funniest people. What's more they're fickle. If a few boys are flying they'll mill around the fellow whose motor is roaring the loudest. They'll crowd him and heckle him with questions. He'll be Exhibit A until he flies. But as soon as the model has landed, they'll desert him and troop over to the next most likely victim and annoy him. Ofttimes it seems as though heckled and desperate builders fly their models before they're satisfied with the adjustments merely to satisfy the mob and enjoy a breathing spell of peace and quiet.

A snappy workbench is the one designed by Sam Hall (ex-Cleveland Balsa Butcher now in Baltimore). When Sam left his happy Cleveland home his old workbench was too permanent a job to carry along. Keeping this in mind he designed a portable job, bought the wood cut to size and assembled the bench in a few hours with nails and screws. The cost was only five dollars for a 30 x 58" working surface. The white pine is solid enough for hammering, yet soft enough for pinning. Five bucks is a cheap ransom to get off the kitchen table. Better get your own table before the housekeeper's patience wears thin. We hope to in-

clude more detailed information in a future issue.

A gold locket we saw recently was provided with a small plush-lined case made of balsa wood. It was hard-grade balsa. Fingernail scratching and close examination of grain structure didn't quite convince us, but a couple of typical worm holes clinched the deal. The locket was more than fifty years old—which was a long time before the model airplane business popularized balsa wood.

The Queens Aero Club (Queens Village, Long Island, N. Y.) goes on record as indorsing night flying because the air is smoother, there's less annoyance from spectators, and it's generally more exciting. Two pen cells supply juice for a flying light that can be seen for quite a distance. A 10-second motor run is a safe amount with a tight turn. Judging distance at night is tricky. The boys estimate the model to be a block away just about the time it lands practically at their feet. During one year of night work only one model remained lost until daylight.

Model building in England continues to move forward, war or no war—judging by model publications and news reaching here. De-emphasis of gas models naturally followed the government ban on gas flights. Rubber-powered Wakefield types and flying scale models are more popular than ever. One interesting feature of English model building is the increasing number of R. A. F. personnel participating. It might seem like a bus driver's holiday for pilots and mechanics to be flying models when off duty, but after all it's a pleasant way to relax. Modeling was probably introduced by the grown-up model builders who entered the air force. They just can't break themselves of old habits. It would be nice to see the same sort of model fever break out in the ranks of our army. There are certainly enough model builders in all branches of the service to start things moving.

Recent fan mail called attention to the neglect we've been heaping on Mississippi. There are plenty of models and builders even though they haven't gotten much notice lately. In Jackson there is an A. M. A.-chartered club that conducted the Mid-South Model Contest last April. In Hattiesburg the boys get together every Sunday for flying at a field a few miles out of town. Mississippi is well up there in the drive to put the Southland on the model map.

### ON THE FIELD. (By Carroll Moon.)

On April 20th we packed off to Berlin, N. J., there to participate in the Spring Gas Meet of the South Jersey Gas Model Airplane Association. The meet was held at the Pine Valley Airport, and honest, fellas, there were almost 300 entrants. We spotted them from such out-of-the-way localities as Boston, Pittsburgh, Washington, Poughkeepsie and other points far and wide despite the fact that visibility was hampered no end by dust storms (miniature) and the

dense smoke of a nearby forest fire.

Here's a good word for the S. J. G. M. A. A. and E. N. Angus, who directed the meet. Mr. Angus is New Jersey State contest director for the A. M. A., and he was assisted by Adam Deren, also a contest director. Cars were parked far enough from the flying field to prevent damage, crowds were held in check nicely, and the meet was really splendidly handled in every respect.

Due to the fact that a strong wind prevailed, hand-launching was allowed by the directors. Despite this precaution scores of planes spun in or were otherwise wrecked and many were lost. The best flight of the day was a big factor in winning major honors for Russell Scott of the S. J. G. M. C., his Zipper averaging 2:27. His fine performance won him practically an armful of prizes, one of the finest being a \$200 course in draftsmanship, donated by the International Correspondence Schools. The course was presented by W. L. Mudge, manager of I. C. S. as a part of the fiftieth anniversary celebration of the school. In addition Mr. Scott won wrist watches, motors, kits and (as we have said) practically an armful of valuable awards. Bob Griscon of the S. J. G. M. A. A. was first in Class B with an average of 2:16. Leon Shulman flew his pet Zombie (Bantam-powered) to first in Class A averaging 2:08. Harry Mayer won the stunt event, with R. Laird second and H. Simmons third. Mayer's plane released a tow-line glider.

Even as we close our remarks on the New Jersey contest, we hang our head in shame, for at hand is an account of the Third Annual Model Airplane Meet given recently by the Bakersfield Gas Model Airplane Association of Bakersfield, Cal. Charles Koby of Van Nuys, flying a Sailplane with a Super Cyclone, took first prize (\$100 plus trophy) and Class C trophy, with a time of 37:15, which constitutes an average of 12:20. Sensational times were made right down the line. Ray Acord of Hollywood was second using the same plane-motor set-up, his total being 37:14. John Drobshoff of Fresno was third and also won the Class A trophy, with a time of 36:58. His plane was a Challenger (New Advance Engineering) using a Bantam motor. Braun of San Diego was fourth with 55:29 using a Zipper with a Tiger motor. In fifth place was J. J. Williams (age sixty-two) of Los Angeles, who did 34:04 using a Zipper and a Gwin motor. Bob White of Pasadena was sixth with 27:02 using a Zipper and a Tiger. Wilfred Gardner (age fifteen) was seventh, winning the Air Trails Junior Trophy and other awards. He flew a Zipper with a Tiger motor. Vernon Buckner of Burbank, using a Brown-powered ship of his own design did 19:14 for eighth place.

Class B honors were taken by William Lain of Hollywood who did 19:02 using a Zipper with a Torpedo. Miss Betty Parsons of Glendale flew a Mercury with an Ohlsson 23 to take the women's award.

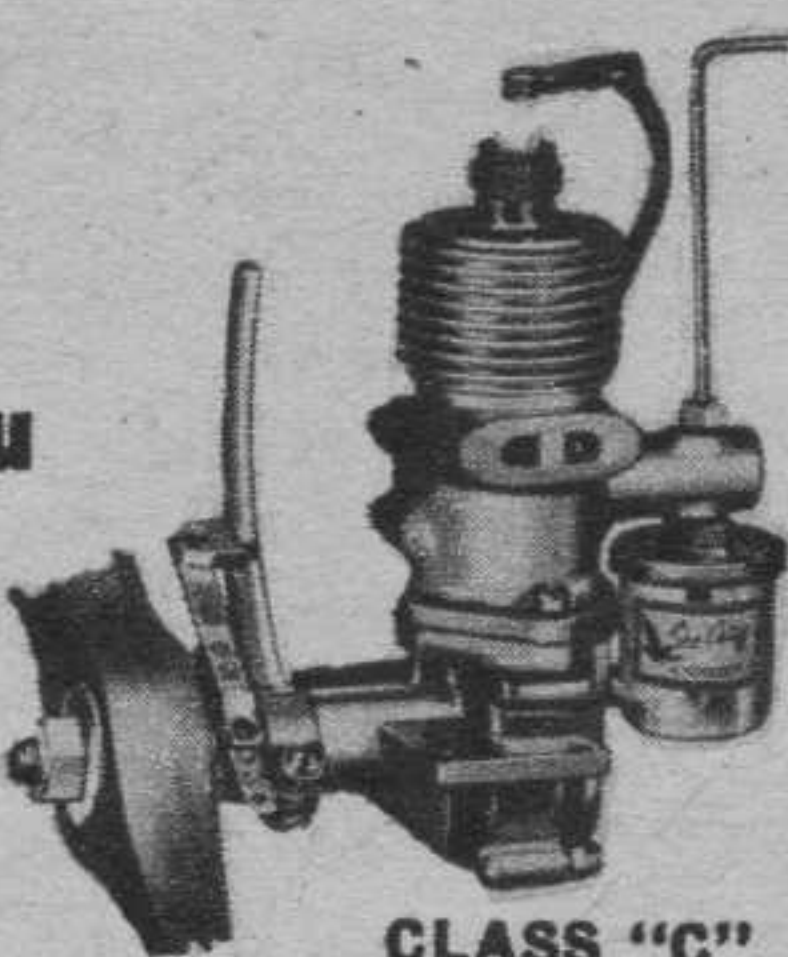


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## MODEL C SAIL PLANE 60" SPAN

Only model on market equipped with original Circle Control and adjustable elevator. ©There is no auxiliary rudder that drops when tow-line is released. Model is designed for either tow-line or high start method of launching.

Kit consists of cement, clear dope, silver dope, grade A wood, tissue, Circle Control assembled, metal parts formed, tow-ring, 300' tow-line, 30' 3/16" rubber strand, 1" dough-nut wheel, lead, full size plan with building & flying directions.

Complete kit \$1.25 + .10 postage  
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Ohlsson 19	Mighty Midget.. 9.50
Ohlsson 23	Synco B 30 ... 7.95
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Brown Jr. D.. 12.50	
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85 A CORTLANDT ST. NEW YORK, N. Y.

There were 396 entries and more than 10,000 spectators on hand. Contestants came from as far away as Phoenix, Ariz., a mere 500 miles. Officers of the sponsoring club are Percy Oldershaw, president; Vern Oldershaw, vice president, and Francis Stewart (who reported the meet), secretary and treasurer.

Thanks to Jack Osgood, the gas and rubber meet of the Lansing (Mich.) Balsa Buzzards, held March 30th, was reported in remarkable detail. Gas events were run off in combined class, and rubber event was governed by a rule allowing ships of "not less than 100 and not more than 210 square inches." Phil Klintworth took first in gas with a Zipper powered by an Ohlsson 23, averaging 5:08.

In rubber, Keith Baker flew a Korda model (old design) to a time of 391 seconds. He also took second with a stick model built from designs by Al Casano in a previous issue of Air Trails. James Moore was third while Earl Austin was fourth. Cliff Black was fifth. Air Trails was well represented at the meet, no less than two California Champs, a Gladiator, two New Rulers, a Buzzard, and a Simplex being reported. Marmon (who won third) flew a Sailplane on an "unofficial" flight of 28 minutes with a 22-second motor run.

The first contest of the new season in Tacoma, Wash., took place March 9th, sponsored by the Tacoma Air Screws. Big winner was Charles Hollinger who won first in the stick event with a Gollywock (2:34 average), first in H. L. glider (2:41 average), and first in gas with a Zipper power by a Tiger (2:52 average). M. Sato, using a Flying Cloud, won the cabin event with 2:45 for an average. Oh, yes, Mazzocini and Tommy Cootsona were publicity managers and furnished us with our information. Shoot the news to us, Screws. We can use it.

Turning now to the East, the Bridgeport Aëronuts held a meet March 16th which resulted in some fine flying. W. Sherman won the

Wakefield event with a 1:34 average. In the stick event, D'Ostilio was first with 2:10 for an average, setting a new club record. The club is now doing considerable indoor flying. Meetings are held in the Bridgeport Armory with flying after the meeting. New officers of the club are Paul Lizak, president; Bill Wargo, vice president; Bob Garnett, secretary, and Bob Porter, treasurer. Ed Whitten was our reporter.

Easter Sunday saw a large group of Eastern modelers at the Pittsburgh-Butler Airport near Pittsburgh, Pa., for the second Allegheny Mountain Area Model Competition. Harry Vogler directed the meet which was sponsored by the Aëro Club of Pittsburgh and the Boys Club of that city. Among the contestants was Bill Good (radio controller supreme) who is temporarily residing in the Smoky City. A high wind prevented good times, but modeling must go on and so did the meet. Paul Myers was first in the gas meet, which was unlimited by class. In the rubber events, results were as follows: R. O. G. fuselage, Ed Gummel, first; H. L. stick, Owen Niehaus, first; H. L. glider, Ed Gummel, first.

We close with the report of the Third Annual Pomona Gas Model Airplane Contest held at the Los Angeles County Fairground. Ray Acord of Hollywood (who took second in the first meet we covered above) took first place with a time of 16:51. Second was taken by Bill Rowe of San Bernardino with 16:02, while Bill McCryndle of Pomona was third with 12:32. Mrs. John Bunting was first in the women's event, with Bill Crowell first in junior division. Bill is eleven. All in all there were 269 entries. The Los Angeles Gas Model Airplane Club won the Fletcher Aircraft Trophy for the best-represented club. The meet was under the auspices of the Jack Ford, Jr., Chapter No. 9, Disabled American Veterans of the World War. Bob Orth, contest chairman, is commander of the D. A. V. chapter in Pomona.

## Down The Runway

(Continued from page 38)

year will be directly below the exhibition hall, so fewer spectators will be running around among the soldering irons and stabilizers-in-construction.

The Model Industry Association is planning its trade show for the Morrison Hotel, so most of the well-known "commercials" will be holding sway at that place. All in all, it is a pretty good idea to have the industry segregated, for then the manufacturers can figure out how to make a better motor to sell for less money without having to listen to a competitor's engine being run by a modeler all night in an adjoining room.

★ ★ ★

**Speaking of Contests.** Can you cope with all the classy contests being conducted in almost every county throughout the country? Do you have competition travelitis? Is it becoming difficult for you to decide

between attending a meet 100 miles east next Sunday, or one 110 to the west? All this to let you know that Academy officials can understand your problem of trying to take in all the big meets in your vicinity. Never before have so many contests been sanctioned by the A. M. A. Contest Board. In fact, there is an A. M. A. Azing amount of competitive activity.

If your club is anxious to sponsor a sanctioned meet, directions are simple. Take one qualified adult, preferably one who has had experience running meets, and shake well until two dollars drops out of his pocket. Take the two dollars and have said adult apply for leader membership in A. M. A. and request appointment as contest director. Proper forms for this will be provided at no charge by Academy headquarters, Willard Hotel, Washington, D. C. When appointed, your contest director (better start being nice to him) applies on official

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New High Thrust  
with New Low Pitch

World's Fastest Climbing  
Propeller!!

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HAND-SANDED

DESIGNED after the "Propeller Handbook" by Karl Hanson Falk, Chief Blade Designer, Hamilton Standard Propeller Co. All modern aircraft use a variable pitch propeller, starting in LOW PITCH for rapid take off and climb. High pitch is used only at high altitudes on level flight, a condition which the model aeroplane propeller does not have to consider. Hence, D-G props are LOW PITCHED for maximum speed of climb, and achieve a minimum torque turn through exact balanced relation of hub and effective blade area.

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Make and Age of Engine At Your Dealer's—  
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## D. G. PROPELLER CHART

Several thousand hours of research have developed the following general facts about propellers:

The ideal propeller seems to be one of the largest diameter the engine will swing and still develop its maximum power. Thus as the pitch was lowered the length was increased. The combination of pitch and length which delivered the most thrust was, of course, the one we chose for our D. G. propellers. The lowered pitch showed less tip loss and a cleaner air flow, plus a greater amount of effective blade area, checked by smoke tests.

Care in cleaning up the hubs added some thrust, but more important, it eliminated what had been drag, smoke showing a smooth airflow around the hub.

Washing out the pitch at the tip also has much to do with the thrust and tip loss. The thrust loss can be measured in curves when the under side of the tip is flat, or completely washed out. While the amount of pitch at the tip of the prop has much to do with the amount of torque, the lowered pitch decreases the "torque turn" so much the final results are a propeller with less "turn" than usual.

Other factors investigated were shape of blade, position of maximum area, etc. It was discovered the shape of the blade had little to do with final results. The position of the maximum blade area was important, i.e., it should be as close to the hub as possible consistent with a well developed hub.

The results of this work are the new D. G. propellers; propellers designed for a faster climb with a minimum of torque turn.

Engine	Prop Size New Engine	Prop Size Old Engine	Engine	Prop Size New Engine	Prop Size Old Engine
Atom	10"	9"	Hi Speed	11"	11"
Bantam	10"	9"	Midget	12"	12"
Bent	9"	8"	Madwell	10"	9"
Brown B, C, M, D	14"	14"	Megaw	10"	9"
Brownie E	11"	11"	Ohlsson 19	11"	10"
Baby Cyclone	13"	12"	Ohlsson 23	14"	14"
Super Cyclone	14"	14"	Ohlsson 60	13"	13"
Borker	14"	13"	Ohlsson Gold Seal	14"	14"
Bunch Engines	13"	12"	O.K. Standard & Special	12"	12"
Comet	12"	13"	O.K. 40	11"	11"
Dennymite	14"	13"	Phantom	10"	10"
Little Dynamite	11"	11"	Perky	10"	10"
Elf	11"	11"	Synco B 30 & PC2	11"	11"
Forester 29	13"	12"	Torpedo	13"	12"
Gym	11"	10"	Tiger	13"	12"
Husky JV	11"	12"	Tom Thumb	12"	12"
Hurlston	13"	12"			

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Make of Motor..... Year Bought.....

Name.....

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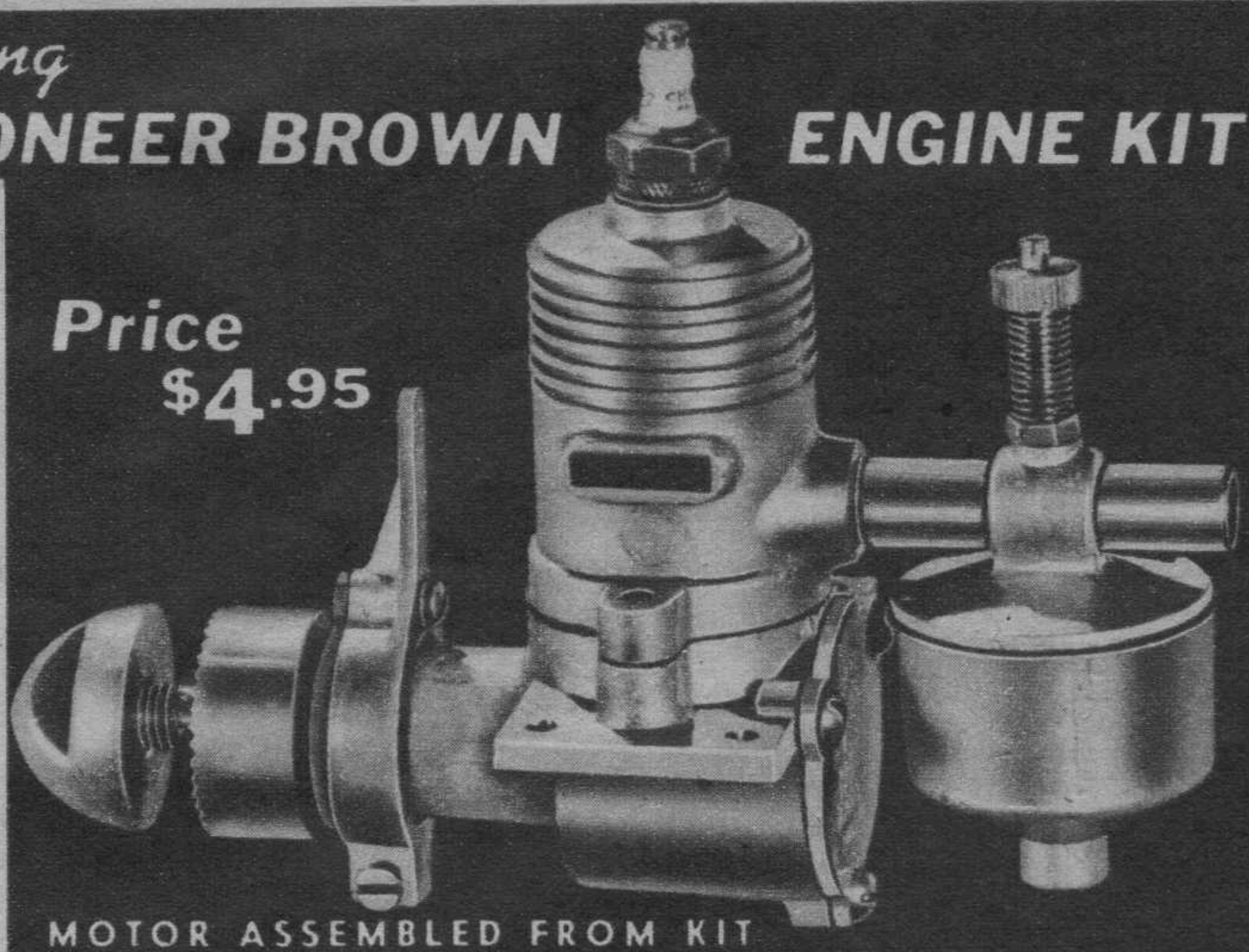
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Stroke ..... 9/16"

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form for Contest Board approval of your meet. Application should be filed as far in advance of meet as possible to permit publicizing in Air Trails. Notice is also sent to the other 1,567,489 1/2 A. M. A. chapters (well, 497 1/2 if you must be specific—the 1/2 club being Cousin Hugo's Bungo-Bungo organization) and your turnout should be terrific.

Take the South Jersey championships, for example. Held on April 20th in a gale, more than 600 modelers turned up, although a number didn't fly on account of the heart-breaking (and model-breaking) wind. But that's an indication of what some good promotion will do for your contest. So shanghai someone to serve as your contest director, have him "bone up" on the subject with Academy contest manual, apply for sanction, advertise meet and be prepared for onslaught.

★ ★ ★

**Lord Wakefield.** The death of Lord Wakefield was felt keenly in the model aero world. His trophy and interest extended far beyond the shores of the British Isles. Through participation in the international Wakefield finals, many countries got their first boost toward widespread interest in aeromodeling. The Wakefield Trophy is in America and in the custody of the Academy of Model Aeronautics. It is expected to stay there until after hostilities and the competition is resumed. In the meantime, the Moffett international cabin event assumes added importance.

★ ★ ★

**New Quarters.** Hey, we've moved. No, we're still in the Willard, but the Academy acquired another room where we can ruminate, talk about modeling, sanction meets, issue licenses, homologate records, advise club leaders, help modelers get jobs, develop club programs, co-ordinate contest dates, grind out publicity anent modeling, answer a million and one questions, and so on far into the night. Also we acquired a new assistant, a Miss Shirley Rapee, and since her arrival we have almost as many motion-picture talent scouts dropping into headquarters as model builders.

★ ★ ★

**Insurance Booming.** You know about insurance for gas modeling? It's available to holders of Academy gas model competition licenses and costs one dollar additional per year. Details may be had from A. M. A., which doesn't get anything out of the business but is glad to undertake work of issuing insurance certificates as a service to its licensed fliers. Many clubs are now requiring that their members hold this coverage for their own and the club's protection. Biggest group to date requiring insurance is Jack Hohne's Newhio Junior Flying Club with headquarters in Dayton, Ohio. Several hundred fliers have been insured and more are expected to be soon.

★ ★ ★

**At Your Service.** How are things with you? Do you need data for establishing a club, running a contest, copies of the national regulations,

official emblem, decals to dress up your model, advice on how to set records or what your nearest model club is? Ask the Academy—that's what we're in business for.

**Contest Calendar Additions.** Hope that you keep your back issues of Air Trails handy. Complete listings of sanctioned meets have been presented during the past several issues and below are listed new additions to the official contest calendar. The dates of several contests included have been shifted, so check your flying schedule with these record trials and meets just approved by the A. M. A. Contest Board.

June 15th, Springfield, Mass. Class A monthly meet Westfield Model Field. Sponsored by the Technical High School Model Airplane Club. Gas all classes and rubber models for award certificates in plastic for outstanding performance. Seventy-five entrants expected. Benjamin R. Bushey, 16 Carlisle St., Springfield, Mass.

June 15th, Allentown, Pa. Allentown Model Cadets Record Trials for rubber-powered models and gliders. Ernest C. Schaffhauser, 636 No. 10th St., Allentown, Pa.

June 15th, Albany, N. Y. (Date change.) Class AAA. State meet for gas, rubber. Trophies, medals, merchandise awards. Sponsored by N. Y. State Exchange Clubs. Harry C. Copeland, C. D., 712 Loew Bldg., Syracuse, N. Y.

June 22nd, Ypsilanti, Mich. Class AA Second Annual Hornet Model Club Meet at McEnnan Airport (three miles south of Ypsilanti via S. Huron St.). For gas all classes and combined C. D. and E outdoor fuselage in rubber. Sponsored by Junior Chamber of Commerce of Ypsilanti. Over \$100 in merchandise and cash awards; 100 to 200 expected. Donald J. Gridley, 192 Oak St., Ypsilanti, Mich.

June 22nd, Knoxville, Tenn. Class AAA Tennessee State Model Meet at McGhee-Tyson Airport. Sponsored by the Thermalite Club and the Knoxville "Journal" Air Cadets for gas all classes, rubber and gliders; H. L. and T. L. Motors, kits and trophies for awards. Seventy-five expected to compete. Hugh Powers, Briarcliff Rd., Fountain City, Tenn.

June 22nd, Steubenville, Ohio. Class A Sky Hawks Club contest for all types of gas and rubber models. At Sky Hawks' Model Airport. Horace M. Southall, 544 Lawson Ave., Steubenville, Ohio.

June 22nd, St. Paul, Minn. Class AAA St. Paul Modelers State Contest. For gas and rubber events. Also helicopter models. At Model Airport, Highway No. 36 and North Snelling Ave. Sponsored by Minneapolis N. A. A. Chapter. Eight trophies, including one donated by noted balloonist, Professor Jean Picard. \$200 plus in prizes, twelve trips to Nationals. Lytton Calrow, 572 North Snelling Ave., St. Paul, Minn.

June 29th, Wilmington, N. C. (Date change.) Class AAA North Carolina State Model Aviation Meet at Wilmington Airport for gas all classes and rubber events. Grand prize all-expense-paid trip to 1941 national meet; merchandise awards. Lloyd B. Hathaway, City Recreation Dept., Winston-Salem, N. C.

June 29th, Allentown, Pa. Class A Allentown Model Cadets Meet at Leh Farms (Lehigh Parkway) for rubber-powered models and gliders. Ernest C. Schaffhauser, 636 N. 10th St., Allentown, Pa.

June 29th, Parkersburg, W. Va. Class AA, Montgomery Ward Co. rubber and gas model meet at Municipal Airport, with sixty dollars' worth of merchandise prizes. Louis V. Moyers, R. F. D. No. 4, Parkersburg, W. Va.

June 29th, Pittsburgh, Pa. Class AA Model Wings gas, rubber and glider meet for merchandise prizes at Model Wings flying field. M. J. Thomas, 246 Morrison Drive, Pittsburgh, Pa.

July 13th, Allentown, Pa. Allentown Model Cadets Record Trials for rubber-powered and gliders. Ernest C. Schaffhauser, 636 N. 10th St., Allentown, Pa.

July 20th, Springfield, Mass. Class A monthly meet at Westfield Model Field sponsored by Technical High School Model Airplane Club. Gas all classes and rubber-powered models for award certificates in plastic for those turning in outstanding performances. Seventy-five entrants expected. Benjamin R. Bushey, 16 Carlisle St., Springfield, Mass.

(Turn to page 63)



## Navy Markings

(Continued from page 23)

guard has its own system of markings.

(8) Each carrier in commission is designated a color and this is painted on the entire tail surface of all planes operating from it. The top and bottom of the elevators are painted, also. These colors are; *Lexington*—yellow; *Saratoga*—white; *Ranger*—green; *Yorktown*—red; *Enterprise*—blue; *Wasp*—black; *Hornet*—not as yet assigned.

(9) The model designation attached to each type of aircraft. These are built up in series. For example, observe the fighting planes manufactured by the Grumman Aircraft Corp. for the navy.

The first Grumman fighter was the XFF-1. The X denotes that this plane is still in the experimental stage and is being tested by the navy. The first F stands for fighter, the type of plane. The second F is the call letter designated to the Grumman factory by the navy. Every plane that is sold to the navy by the Grumman people will carry the letter F in its model number. (Examples—F4F-3, JRF-1, J2F-4.) The one stands for the first model of that type built.

The second plane was the XFF-2. This shows that a minor change was made in the original design, but not enough to change the entire plane type. The third plane was the XF2F-1. This plane was vastly different from the FF-2, and so the plane type has been converted from one (not written) to two, and the model of that type has reverted back to one, as it is the first model of that type built.

The next plane was still different, and so was called the XF3F-1. Next came the F3F-2, which only constituted a change in the power plant. This type was further modified into the F3F-3, but the next type was a monoplane, so the type has advanced still another notch and becomes XF4F-1. This type has been altered four times, so that the current model is the F4F-4. Still another type appeared, this one with two engines instead of one, and so is called the XF5F-1.

The manufacturer's symbols in use at the present time are as follows: A—Brewster; B—Boeing; C—Curtiss; D—Douglas; E—Bellanca; F—Grumman; G—Great Lakes; H—Hall-Aluminum; J—North American; K—Kinner; L—Bell; M—Martin; N—Naval Aircraft Factory; O—Lockheed; P—Pittsford Autogiro; Q—Stinson; R—Ford; S—Sikorsky and Stearman; T—Northrop; U—Vought-Sikorsky (formerly Vought); W—Waco; Y—Consolidated; Z—Pennsylvania Autogiro.

(10) The individual serial number of each plane. There are four figures and the number of the plane may range from 0001 to 9999.

One or two stripes are placed horizontally on the left side of the vertical stabilizer on all carrier-based monoplanes. This is a visual aid to the landing officer on the deck of the carrier as he is flagging the planes in for a landing.

A small turtle with wings may be

seen in the top of the rudder on many carrier planes, and this denotes a "Shellback," or one who has flown over the equator and undergone the ritual on the carrier after returning.

The next largest division of naval aircraft is that of ship-borne catapult planes. These may be found in both the battleship and cruiser divisions of the U. S. fleet.

### Battleship Aircraft

These planes operate for the most part on single floats but change to wheels at shore bases when the fleet is not at sea. The main differences between battleship markings and those of regular carrier planes, lies in the marking of the plane and the name of the ship it is from. The ship's name is placed to the rear of the plane number. These planes have solidly colored tail units but the colors are of a different designation than carrier aircraft. The following is a list of the five battleship squadrons: VO-1—red (Observation Squadron One); VO-2—white; VO-3—blue; VO-4—black; VO-5—green.

### Cruiser Aircraft

Cruiser-borne planes may be distinguished by a horizontally striped tail and by the letter C before the squadron mission letter. (S as all cruiser squadrons are scouting squadrons.) Thus, all planes operating from cruisers have the two letters CS on the side of the plane, with the name of the cruiser written beneath the CS. Both the rudder and vertical fin, and the elevators, are striped with a wide colored band. This color is determined by the cruiser squadron to which the plane is attached.

### Experimental Aircraft

This type of plane is painted all aluminum and has the word Anacostia (naval experimental station) on the side of the plane. The model number of the plane usually has the prefix X before it. As a rule, only one experimental model of each type is manufactured, but the navy has ordered two planes of the new Grumman XTBF-1 type.

### Training Aircraft

Primary training planes are painted all yellow and, as a rule, do not carry any squadron markings whatsoever. They do carry an individual plane number, however.

Advanced training planes are painted the regulation silver fuselage, with the upper portion of the wing being yellow-orange. These carry squadron markings.

### Reserve Aircraft

The navy operates reserve air bases throughout the country and these reserve squadrons have their own system of markings. Two types are in use at the present time. The first is the reserve plane which has a striped red, white, and blue rudder. The second is the type bearing a full-colored tail unit. Both types use individual plane numbers, but not squadron markings. The section coloring is retained, however.

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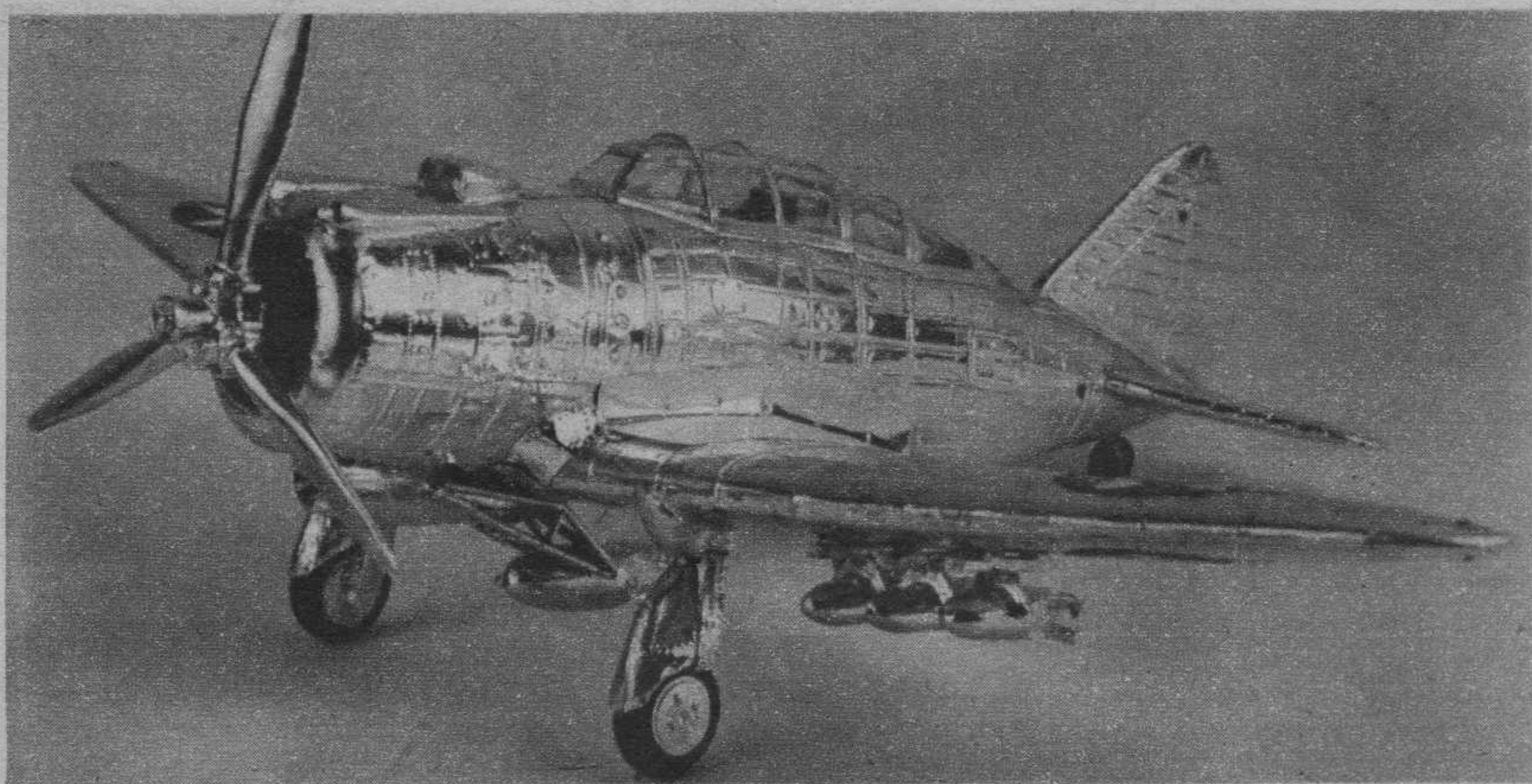
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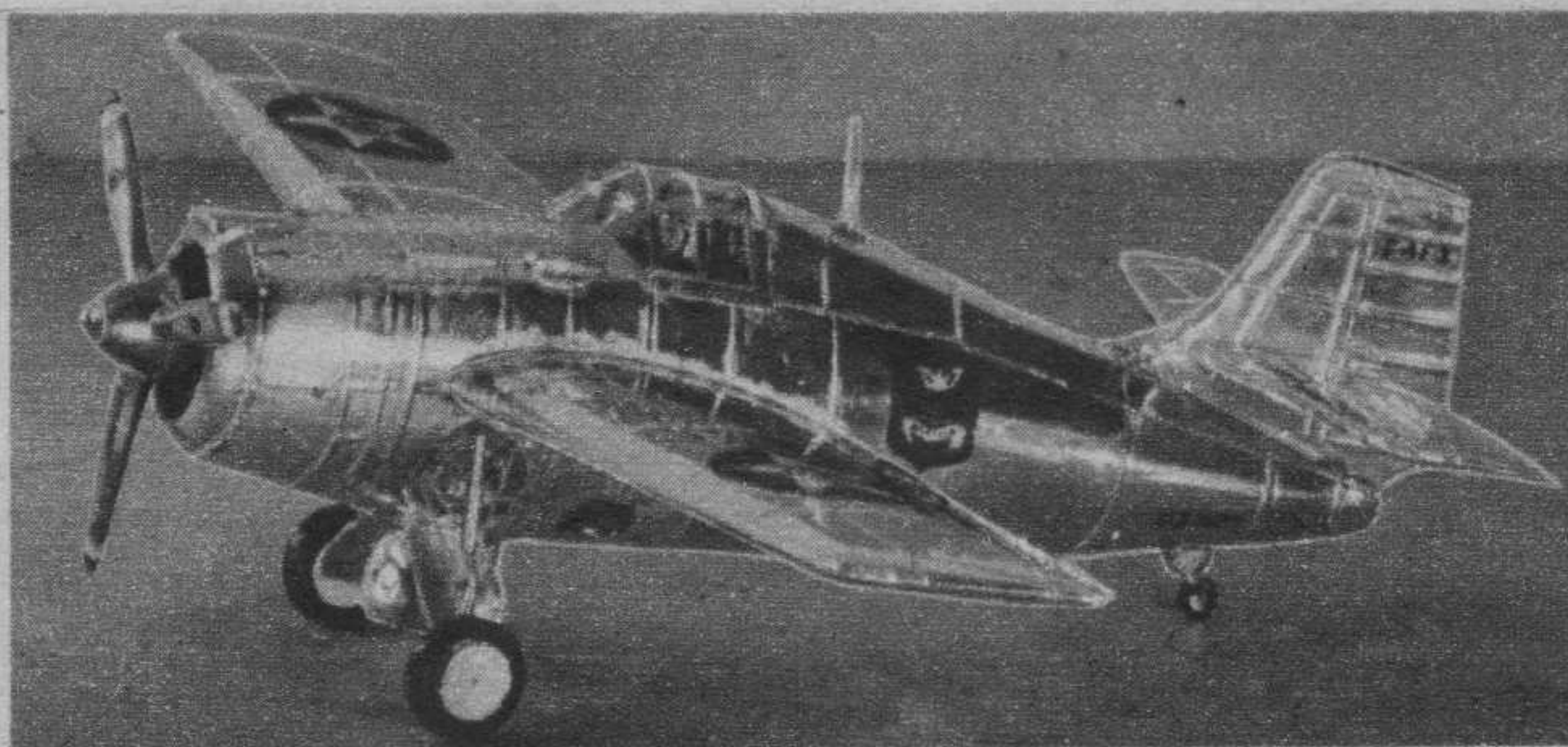


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The letters N. R. A. B. stand for naval reserve air base and are used by a few bases at the present time. When this is used, the name U. S. navy is placed directly beneath the N. R. A. B.

## Patrol Aircraft

The patrol section constitutes the only branch of the navy which has the squadron mission letter and the sectional strips separated. On patrol planes, the squadron designations are painted on the nose of the plane, while the section stripe (on the leader) is painted on the rear portion of the fuselage.

Each patrol squadron has its own tail markings and some utilize elaborate checkerboard designs. These colors have not been released by the navy department so cannot be fully explained or listed.

## Command Aircraft

This is divided into two types. The first type is painted all blue with a silver tail. (A few in service are painted half silver and half blue, with silver tail units.) A rectangular metal holder is placed on the side of the plane to hold the card denoting the rank of the officer using the plane.

Each carrier has a command plane attached and these have a diagonal stripe across the fuselage, the same color as the carrier's color. "Air Group Commander, U. S. N.," and the name of the carrier are placed on the side of the plane.

## Specially Marked Aircraft

(a) There are various experimental districts allotted by the navy, and planes operating under these districts are marked by large numbers and letters on the side of the fuselage. An

example of this would be 2XdlG. This means that this is the sixth plane from the second experimental district. District scouting units are being organized at the present time and aircraft operating in these districts will be marked with an S instead of an X.

(b) I. N. A. on the side of the fuselage stands for inspector of naval aircraft.

(c) N. A. S. means naval air station and is usually followed by the name of the station that the plane is from, such as Alameda or Norfolk.

(d) N. P. G. Dalgren denotes a plane from the Naval Proving Grounds.

(e) N. A. F. Philadelphia denotes a plane from the Naval Aircraft Factory.

## Marine Aircraft

Marine planes use the same system of squadron markings as the navy, but place the letter M in front of the squadron mission letter on all of their planes.

Marine planes have striped red, white, and blue rudders, and the name U. S. Marines is placed under the elevators as usual. Some of the older marine planes have this on the side of the fuselage.

The squadron insignia is placed on the vertical stabilizer and their marine insignia under the cockpits.

Many other specially marked planes are in use by the navy and marines, but a complete listing of them is unavailable and for the most part only temporary, as the markings change very rapidly. But this constant change is what makes a study of naval markings interesting and educational.

## You Can Still Get It Free

(Continued from page 20)

ten students. He must have an established flying-school business approved by the C. A. A. Ground school is obligatory, and is usually established by the college. So, if you are a student of a college or university which has been awarded the program, you may apply for it. You will have to pay a registration fee of ten dollars, nine dollars for insurance and six dollars for the C. A. A. medical exam which, by the way, for students of the government training program is stricter than for the man on the street. If you wear glasses you may just as well abandon the whole idea and save six bucks. Your college may have a quota of twenty men, but one hundred have enrolled for the training. They are all eligible for the ground courses, but only one-fifth will actually handle the stick. The rest will be eliminated through failure to pass the physical test, poor marks or being unsuitable pilot material. It is entirely up to the institution to accept or reject you for flight training.

Seventy-two hours of ground instruction are required by the government in conjunction with flying. These are usually divided into three weekly periods of two and one-half hours each. You are taught theory

of flight, line inspection, air regulations, navigation and meteorology. Elight training consists of thirty-five hours of air time, of which seventeen hours are dual and eighteen solo work. A minimum of eight hours' dual is actual flight training; the remaining nine are check flights to determine your progress. Your flying instructions are divided into four stages. In the beginning of Stage A you are taught the working of airplane controls, warned not to touch the propeller without making sure first that the ignition switch is off, never to attempt starting the engine unless there is a qualified person at the controls and to make sure that the wheels are *chocked up* before swinging the prop. Each airport having its own air-traffic problems and regulations, you must familiarize yourself with them. Having learned all this you are given eight hours of dual time stretched over a period of no less than fifteen days, the last fifteen minutes being your first solo flight, if you are an apt student. Prior to the solo your instructor will give you a written test on air traffic rules.

In the next stage, B, you are given five hours of solo and dual check time over a minimum period of eight



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days. In Stage C you get eleven hours solo and dual check time in a minimum of eighteen days. By then you have been taught starting, warming up and stopping procedure, taxiing, S turns, steep power turns, 30 and 70-degree eights, pylon eights, stall with power off and on, climbs and glides, some with S pattern, spins with N. A. C. A. recovery, and simulated forced landings. You are ready to go into the last stage, D, which consists of eleven hours' solo and dual check time in not less than eighteen days. Here you review with your instructor what you have learned in the three previous stages, are given cross-wind take-offs and landings, forward and side slips, power approaches and landings and finally cross-country work. A complete private pilot's flight test is given to you by the instructor to make sure that you are ready to appear before the C. A. A. inspector and pass your exam for the private pilot's license. Remember that you must seriously apply yourself to your flight training. You have a lot to learn in these thirty-five hours, and if the operator sees you are not progressing as well as you should, he has a right to wash you out. The government pays him for only thirty-five hours of your instruction, and if it takes you more than that to get to the point where you are ready for your private ticket the expense will have to come out of his own pocket.

Well, you say, it's all fine and good. If I am lucky enough to attend a college which has the C. P. T. Program I may be able to get in on it. But suppose I attend a school which is not blessed with it, then what? The truth is that more and more colleges are being awarded contracts as the program expands, and eventually your school may get one. At present there are close to 500 institutions which have government training contracts. There is another way, though, for you to get in on the training. At present a number of colleges have trouble in filling their quotas, because they do not recognize it as an academic course and do not give credits for it, with the result that a number of students cannot spend an average seven and one-half hours per week of ground school work and in addition travel several miles out of town for their flying instruction, when they have more than enough to do to keep up with their regular studies. This shortage in quota gives you a chance to apply for flight training provided you have a minimum of thirty college credits in the last two years. All you have to do is to find out from the operator if he is short on his college student quota, and what college he is connected with. Then apply to this college for flight training.

If you have never attended a college or university the government will not summarily reject you. It also provides for the noncollege man, although not quite as generously. The C. P. T. noncollege program is sponsored by your local civic organization, such as the chamber of commerce, which takes care of the ground-school training by letting out the contract for it either to the local operator or any organization which

has the facilities for it, or by setting up its own school, providing equipment, classrooms, hiring a licensed ground instructor and supplying text books. For every one hundred students enrolled in such a school there are ten flight scholarships. In order to be eligible for them the students must pass a competitive examination equivalent to the private pilot's written test. The ten passing with highest grades are then elected for flight training at the flying school appointed by the civic organization sponsoring the program. Any individual or group can donate a sum of money sufficient to pay for the instruction of one or several non-college students. The price is \$325 per person. In this case the government allows the ground school to award additional scholarships to as many of the students as are taking flight training on outside contributions, so as to bring the quota up to ten trainees for each one hundred students who are enrolled in ground school.

So now, college man or not, you are in possession of a private pilot's license and can enroll for secondary training. This course consists of 145 hours of ground work and from forty-five to fifty hours of flying time. You will handle a much more powerful airplane, similar to one used by the army or navy for primary instruction.

The program has many advantages. The student benefits greatly through better instruction methods which have been carefully planned out by government flight training experts. After thirty-five hours of preliminary training he is a much better pilot than many who have had one hundred hours in the air, but have not gone through the controlled method of instruction. Of course there is room for improvement in the program. Colleges should give academic credits for ground school and flight training. After all, such useful subjects are included as theory of flight, navigation and meteorology. Given credit for participation in the C. P. T. P., the students will not hesitate joining it, and there will not be any shortage in quotas as is the case with a number of institutions at present. There should be some provision made by which graduates from the government training program could keep up their flying. Thirty-five hours of the best possible training are not enough. That will give the fundamentals, but only continuous practice will make an accomplished pilot out of the student.

All this will, undoubtedly, be ironed out in the near future. In the meantime the Civil Pilots Training Program is doing a bang-up good job. It is stimulating interest in aviation, it has given thousands of young people a chance to fly, it has tremendously improved methods of instruction, is making a better pilot out of the student than was possible before. It has helped a number of operators and flying schools to get firmly on their feet, has raised the production of airplanes, parts and accessories, and will help develop a better airplane. We sincerely hope that this good work will continue even when a national emergency no longer exists.

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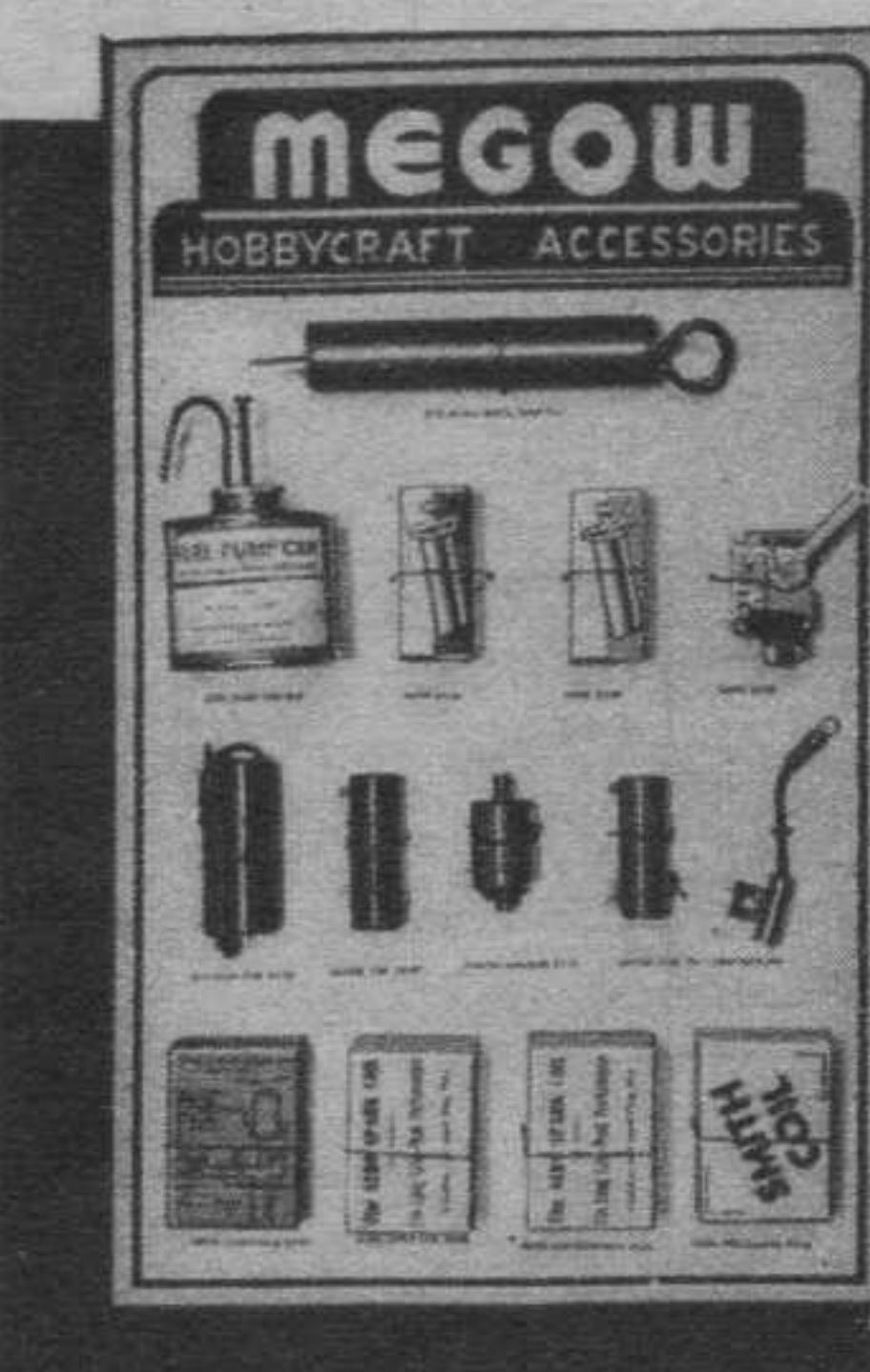
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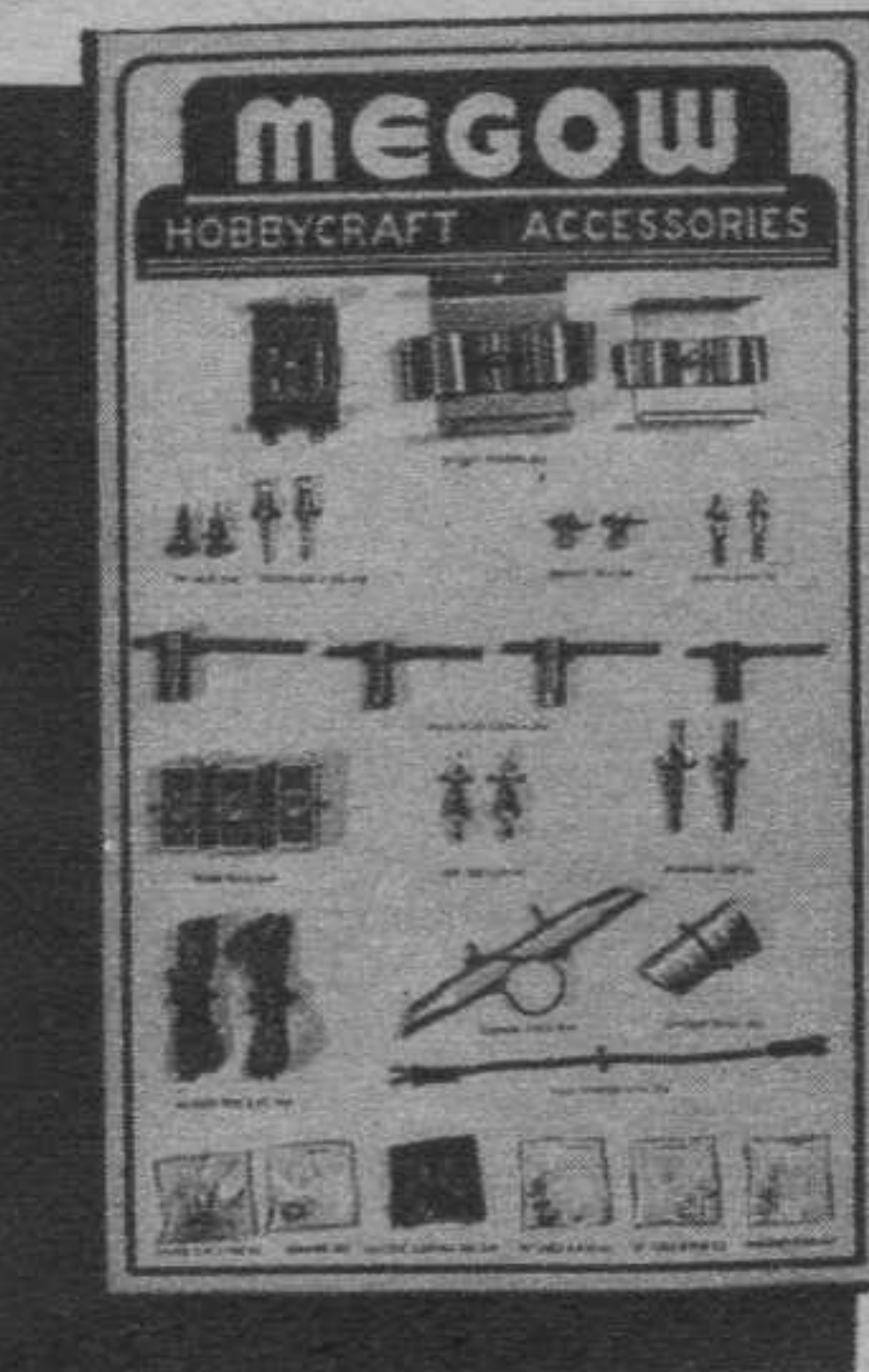
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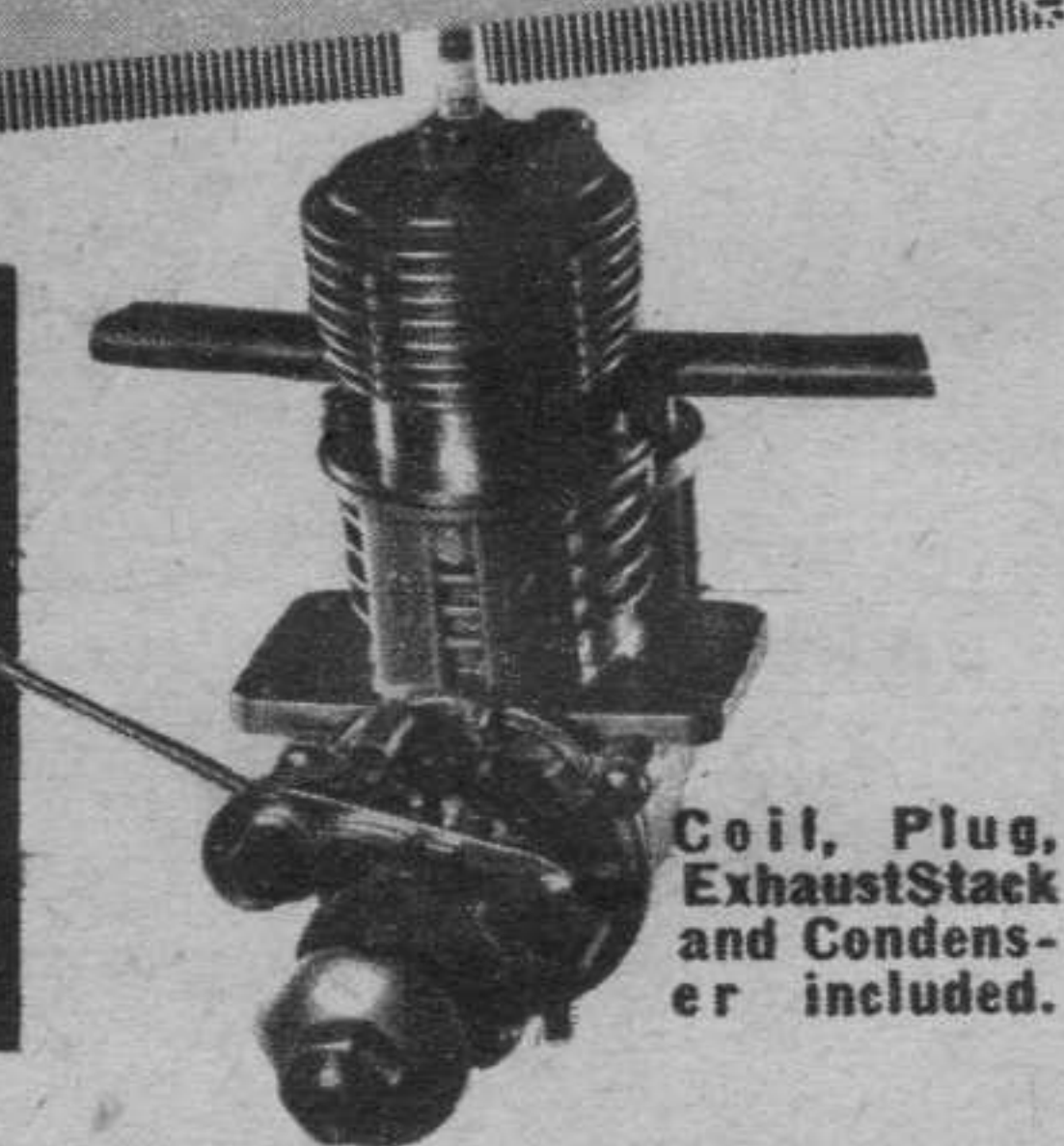
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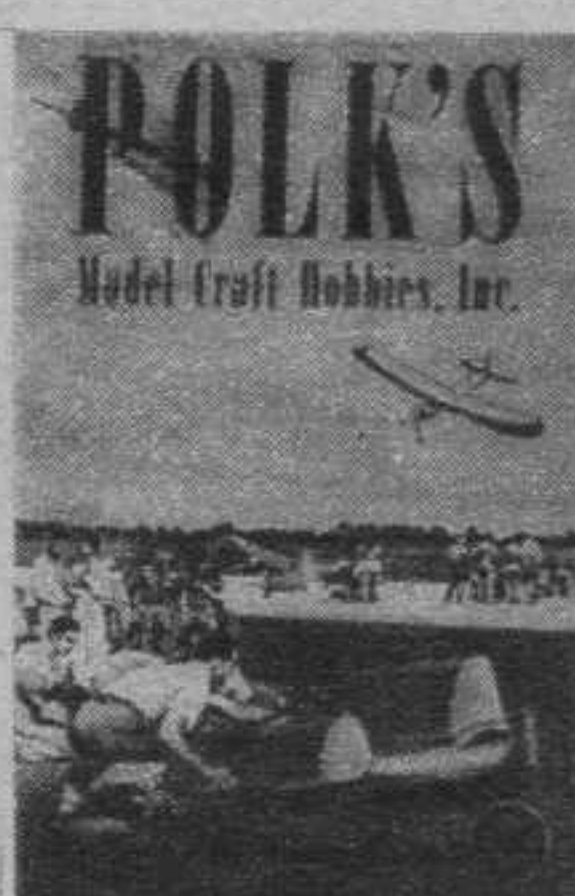
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## That Secret Bomb Sight

(Continued from page 17)

another direction at an unknown speed.

The pilot attempts to fly at a predetermined altitude. Adjusting his speed, corrected for altitude and temperature, he sights the objective and signals the bombardier, who takes over. From past experience the crew knows that altitude is safety; the enemy cannot hear nor see the plane, and the only danger lies in intercepting aircraft.

The principle of operation is simply this: The bomb sight solves an equation for the time to drop a bomb so that it will strike not where the ship is, but where the ship will be about thirty seconds later. The number of seconds is computed according to the altitude and the terminal velocity of the bomb, which varies as the shape, weight and finish of the missile. The velocity ranges from 450 to 650 miles per hour; for convenience let us suppose a very fast, streamlined bomb is dropped which will complete the journey from plane to water from 30,000 feet in about thirty-five seconds.

The difficulty lies in solving the complicated problem of when to drop, and that is where the bomb sight comes in. All the bombardier has to do is insert the *known* facts, allowing the machine to solve for the *unknown* item. He knows his altitude and therefore the time required for the bomb to hit after it leaves the plane. He knows the speed of his plane and the direction it is flying. Knowing these facts he can solve for wind drift, the speed of the battleship, and the instant to unleash a devastating, 1,000-pound bomb.

What chance would he have of hitting the target with an ordinary bomb sight of the drift-indicator type, or with one of the reasonably accurate facsimiles of the electrical type, purported to be used by foreign powers? The answer is, his chances of obtaining hits are not good.

The factor of error that is almost eliminated from the army's bomb sight is the human element. This is reduced by two methods—the actual computation of the time to drop is done automatically once the bombardier puts the altitude and air-speed into the machine, and second, each bombardier can practice hour after hour on the ground.

This is done in a practice bomber, of which there have been some photographs taken. The students are seated atop a device something like a nightmarish, prehistoric velocipede. (The bomb sight, located in the front of the thing, is *always* carefully covered up with a canvas!)

Actually, the device is about eight feet high, four or five feet long, and carries the pilot and bombardier. The pilot can steer the contraption by means of a wheel, and the motive power is supplied by an electric motor, geared to make the bomber move over the pavement and giving the bombardier an illusion of a plane flying at high altitude.

The target is located some yards away, consisting of a little box a foot square. This target can be made to move at various speeds and thereby give the impression that a moving ship would make. By peering through the bomb sight and inserting the assumed speed and altitude, the bombardier can make a simulated bombing run on the target and get all the advantages with none of the trouble. The practice bomber creeps toward the target, the bombardier turns his knobs and wheels, presses the little valve down, the wheels go round and round and the bomb comes out—right on the target.

The bomb in this case, however, is a plumb bob that makes a pin-point impression on a paper target built to scale and therefore giving an accurate point of impact.

Thus the bombardier gets an accurate sight on the ship, putting it squarely in the view glass on the bomb sight. He arms his bombs, starts the sight, sets the bomb release and adjusts the gadgets. The plane roars steadily on its way. Suddenly there is a click, as the bombs fall lazily from the plane on their half-minute journey to the moving ship.

There are several shortcomings of high-altitude bombing of this kind, and perhaps the reader has already guessed them. What if the ship should turn, or zigzag? What would be the percentage of hits, and how would the bomber take aim? The answer is that the bombardier tries to figure out the pattern of turns. Every human mind has a natural pattern, and sometimes it is revealed in a few zigs; all the bombardier has to do is aim at a zag and the unfortunate ship will get herself directly underneath a few tons of bomb.

How, you may ask, do cloudy skies affect such bombing? The answer is that any kind of bombing is impossible if the target cannot be seen. If the ceiling is low—say 15,000 feet—the bomb sight can be used. But this in turn leads to another disadvantage, that of anti-aircraft fire. At such a low altitude AA fire is fairly effective, and a bomber would in all likelihood be shot down. One reason that AA fire is so effective is because the bomb sight requires a constant, steady approach to the target in order for the accuracy to be high, and a steady approach is just what AA batteries like. Any turn, or changes in speed or altitude make the solution as furnished by the sight incorrect.

The advantages are obvious: Besides these there are the tactics used by the Nazis which are easily adapted to the bomb sight. That is, one well-trained, experienced bombardier using a "secret" sight can lead a full squadron of eighteen planes as a single unit, each pilot dropping his bomb when the signal to drop is given by the bombardier. A salvo of eighteen 1,000-pound bombs would be enough to lift any ship out of the water.

Not the least advantage is the factor of speed at high altitude, which renders the bomber almost im-

pervious to attack. As has been pointed out in previous articles, a pursuit plane cannot easily catch a modern bomber once the bomber is in the lead, and a pilot can hardly see a bomber in the thin air of high altitude in time to take out after him.

Finally, the fact that anti-aircraft fire is ineffective at such altitudes means that there is safety there. This means safety for crew, plane and sight. Not the least of the hazards is the possibility of capture by the enemy of this valuable military weapon.

There have been many attempts by foreign powers to obtain possession of the sight, attempts ranging from bribery to theft. Great care must be used from the day of design, manufacture, assembly and commission, to the day it is delivered to the flying squadron where it is to be used. And even there it is guarded, watched, kept from prying eyes and photographers, and put into a safe when not in use.

And don't think, either, that just because you belong to the air corps you may walk in and take a look at the sight whenever you feel in an inquisitive mood. Only certain recognized officers qualified by rank or duties may even draw it from the issuing officer.

Should a new sight be needed or an old one need repairing or checking, a requisition is put through and sooner or later a new sight appears in the vault or the same one returns in perfect working order after a mysterious disappearing act. It is even said that should a sight come back from a practice mission too late to be placed under the time-locked protection of the guarded vault it is entombed in the solitary confinement cell in the guard house under ample armed guard.

The sight is not made by one manufacturer, but several, they say, no manufacturer knowing how his unit is incorporated into the completed sight, or where the finished instrument is assembled.

All this, of course, puts a limit to the number of sights in use and the number that can be safely manufactured. Fortunately a single sight can be used to lead many planes, and one sight in a practice bomber can be used twenty-four hours a day, and by countless pilots.

How many hits can a good bombardier obtain with this sight? The military pilots give no facts or figures, so no statistics are available. But one bombardier was heard to remark that if he could only see a fly from 5,000 feet so that he could take aim, he would put his bomb on the fly's right wing.

The most encouraging fact seems to be that no one person knows how the sight works, not even the manufacturers themselves. Pilots and bombardiers certainly do not know what is inside this machine, and that is a foolproof safeguard. It can truthfully be said that, although hundreds know how to use it, hardly a one knows how it works!



## Radio-control Gadgets

(Continued from page 29)

device because it prevents any injury to the mechanism in the event the rudder flap is accidentally forced out of line.

One of the major problems of constructing successfully working mechanisms is the determination of the size, strength and placement of the electromagnets. This is of great importance, as these electromagnets are instrumental in making for foolproof controlled flight. A large electromagnet will require, because of increased current drainage, larger batteries. This will cause an increase in the weight of the plane which is undesirable. To determine the proper size of the electromagnets required to operate the control mechanisms with a margin of safety, we must know the following:

1. The pull in ounces required to actuate the mechanism.
2. The air gap between the armature and the electromagnet.

If we substitute the required numerical figures in the formula shown in Fig. 8, we may easily determine the amount of current and therefore the size of the batteries necessary to operate the mechanism. It will be noticed in the figure that the electromagnet is slightly different from those

usually used. Half of its core is combined with the armature bar to form a sort of plunger. This method utilizes the concentrated flux in the center of the windings, producing a strong magnetic pull.

As an example let us determine the current required to cause the tail-control escapement to actuate. Let us say we have taken the following measurements. What we want to determine is the amount of current necessary to cause our mechanism to function with considerable safety margin. For example:  $N=200$  turns of #20 copper wire (insulated);  $P$  (the pull)  $=1/16$  of a pound;  $Z$  (the air gap)  $=1/8$  of an inch;  $D$  (diameter of plunger in inches)  $=1/4$ . Substituting these values in the formula, we obtain the following:

$$200I=3000 \left( \frac{1}{8} \right) \sqrt{\frac{1}{16} \div \frac{1}{4}}$$

Solving for  $I$ , we obtain 0.31 amps. for an answer. One good small flashlight cell will average at least 4 amps, which is more than sufficient to operate the mechanism.

Address all inquiries to T. Petrides & Associates in care of the editor of this magazine.

## Down The Runway

(Continued from page 58)

July 20th, Cleveland, Ohio. Class AA, rubber and gas model contest at Fairmount Flying Field. Sponsored by Red's Model Shop. \$150 worth of motors, merchandise and trophies. John W. Hilligas, care of Red's Model Shop, 7804 St. Clair Ave., Cleveland, Ohio.

July 20th, Hampton, Va. Class A Hampton Roads Model Assn. Monthly rubber and glider meet at Morgan Field. Dick Everett, R. F. D. No. 3, Box 111, Hampton, Va.

July 27th, Harrisburg, Pa. Class AA Capital City Cloud Chasers' midsummer meet sponsored by Harrisburg Exchange Club, for gas, rubber and gliders. Prizes not yet completed. Fifty entrants expected. Dr. J. Clarence Bachman, 2121 Derry St., Harrisburg, Pa.

July 27th, Allentown, Pa. Class AA Allentown Model Cadets' First Annual Rubber-powered and Glider Outdoor Meet at Leh Farms. Medals to be awarded first and second-place winners in each classification and class. Stick, C and D; Cabin, C and D; gliders H. L., B and C; gliders T. L., Class D and E. Ernest C. Schaffhauser, 636 N. 10th St., Allentown, Pa.

August 3rd, Steubenville, Ohio. (Date change.) Class AA. First Annual Sky Hawk Invitation Meet at Sky Hawks' Private Airport ten miles west of Steubenville, Route 43, for gas all classes, rubber and gliders. Seven gas motors, nine gas model kits, \$100 in merchandise prizes. Sponsored by American Legion Argonne Post No. 33. Horace M. Southall, C. D., 544 Lawson Ave., Steubenville, Ohio.

August 3rd, Albany, N. Y. Record trials. Capitol District Aeronautic Society. For all classes rubber, gas and Gloversville, N. Y. C. D.—Albert L. Gloversville, N. Y. C. D.—Albert L. Hurd, 17 Locust St., Stop 29, Schenectady Road, Albany, N. Y.

August 10th, Ames Iowa. Class AAA Third Annual Iowa State Model Airplane Meet at Walter Grove Field (one mile north of Ames) for combined gas (Sr.), combined gas (open), all ages in Class A and rubber-powered (Jr. and Sr.). Cash prizes and trophies (no merchandise) totaling about \$150. 115 expected at meet to compete. W. Jerry Gerbracht, Ames Theater Co., Ames, Iowa.

August 10th, Allentown, Pa. Allentown Model Cadets Record Trials for rubber-powered models and gliders. Ernest C. Schaffhauser, 636 N. 10th St., Allentown, Pa.

August 17th, Springfield, Mass. Class A monthly meet at Westfield Model Field. See July 28th listing. Benjamin R. Bushey, 16 Carlisle St., Springfield, Mass.

August 17th, Milford, Conn. Class AA Bridgeport Gas Modelers Second Annual Gas Model Meet at Beardsley Tract (Meadows End Rd.) for gas all classes and special events. Sponsored by Bridgeport Gas Modelers. 200 expected to compete for motors, kits, and merchandise. Fred Weimann, 13 Oak Ave., Milford, Conn.

August 17th, Hampton, Va. Class A Hampton Roads Model Assn. monthly rubber model and glider meet at Morgan Field. Dick Everett, R. F. D. No. 3, Box 111, Hampton, Va.

August 24th, Allentown, Pa. Class A Allentown Model Cadets Meet at Leh Farms (Lehigh Parkway) for rubber-powered models and gliders. Ernest C. Schaffhauser, 636 N. 10th St., Allentown, Pa.

September 7th, Allentown, Pa. Class A Allentown Model Cadets Meet at Leh Farms (Lehigh Parkway) for rubber-powered models and gliders. Ernest C. Schaffhauser, 636 N. 10th St., Allentown, Pa.

September 7th, Albany, N. Y. Class AA Capitol District Aeronautics Assn. Invitation Meet for gas and rubber at Albany Airport. Trophy and merchandise prizes. Albert L. Hurd, 17 Locust St., Stop 29, Schenectady Road, Albany, N. Y.

September 14th, Harrisburg, Pa. Class AA Capital City Cloud Chasers' Fall Contest. (See July 27th listing.) Dr. J. Clarence Bachman, 2121 Derry St., Harrisburg, Pa.

September 21st, Springfield, Mass. Class A monthly meet at Westfield Model Field. (See July 20th listing.) Benjamin R. Bushey, 16 Carlisle St., Springfield, Mass.

September 21st, Allentown, Pa. Class A Allentown Model Cadets Meet at Leh Farms (Lehigh Parkway) for rubber-powered models and gliders. Ernest C. Schaffhauser, 636 N. 10th St., Allentown, Pa.

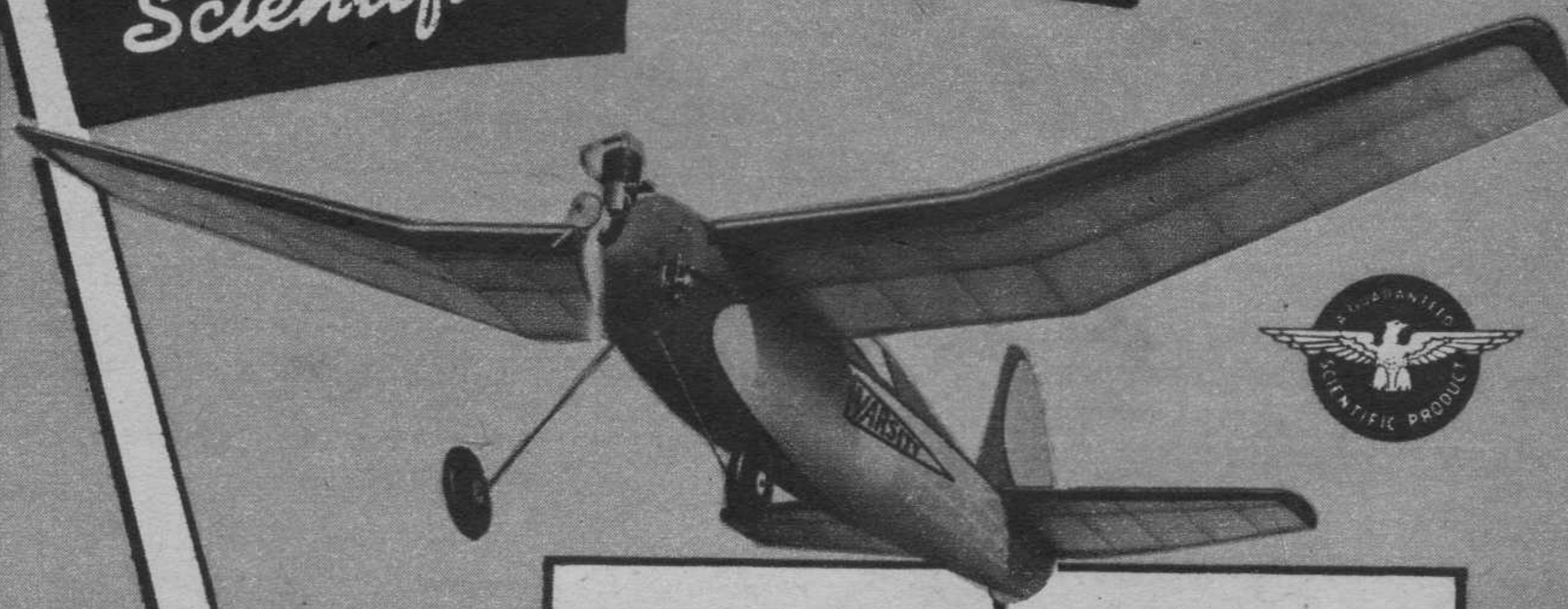
September 21st, Hampton, Va. Class A Hampton Rds. Model Assn. monthly rubber model and glider meet at Morgan Field. Dick Everett, R. F. D. No. 3, Box 111, Hampton, Va.

September 21st, Schenectady, N. Y. Record Trials. Capitol District Aeronautic Assn., Schenectady Aëro-neers Division. For all classes rubber, gas and glider models. Albert L. Hurd, 17 Locust St., Stop 29, Schenectady Road, Albany, N. Y.

October 19th, Hampton, Va. Class A Hampton Rds. Model Assn. monthly rubber model and glider meet at Morgan Field. Dick Everett, R. F. D. No. 3, Box 111, Hampton, Va.

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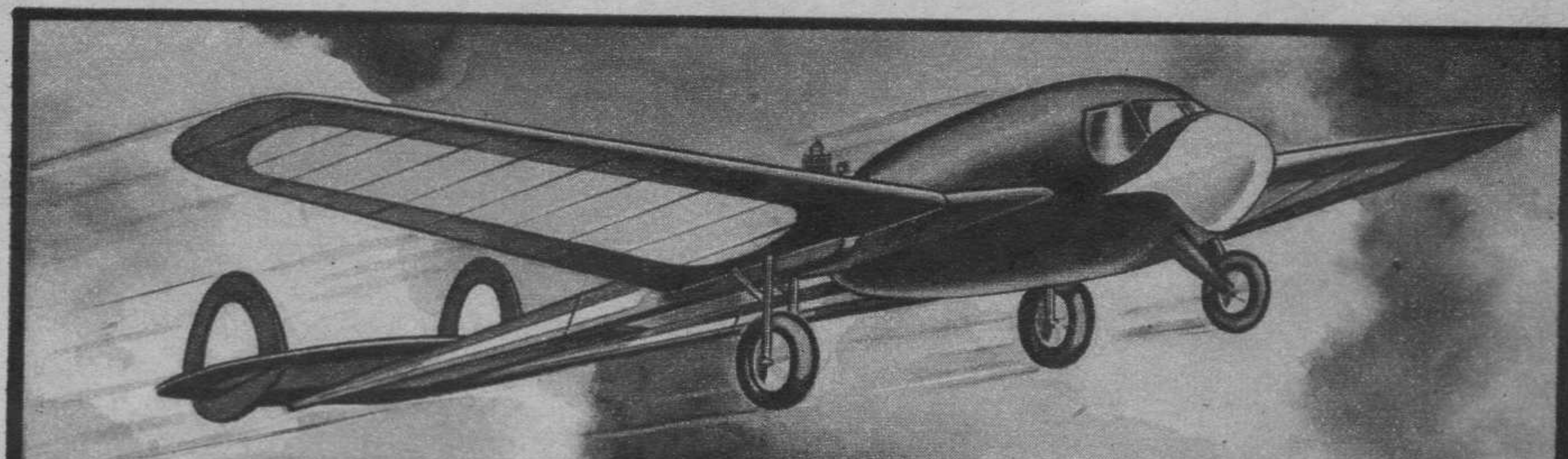
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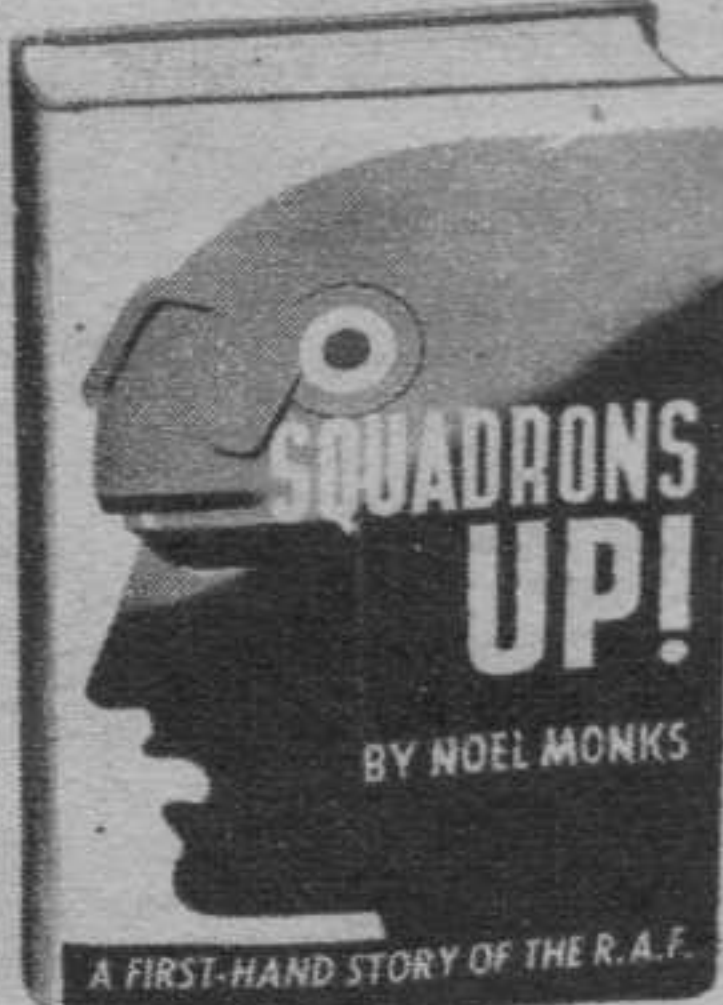
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## Moffett Eliminations Winner

(Continued from page 39)

one-half the difference of the top and bottom widths of that station. All cross pieces are  $\frac{1}{8}$ " square except the pieces of Stations 7, 8, 9, 10, which form the wing seat. These are made of  $\frac{1}{8}$ " sheet.

Fill in between Stations 1 and 2, 15 and 17, with  $\frac{1}{8}$ " sheet all around except top section between Stations 16 and 17 which is covered with celluloid. Rear hook ( $\frac{3}{16}$ " dowel) bearing plates are made of  $\frac{1}{16}$ " sheet aluminum. Drill  $\frac{11}{64}$ " hole in center of plates. Flange corners down with pliers and force in place and cement. Ream holes with small round file until  $\frac{3}{16}$ " dowel fits snug.

Landing gear is formed from  $\frac{1}{16}$ " music wire to pattern on Plate 1. It is glued and bound to uprights in Station 6. The uprights are braced with  $\frac{1}{8}$ " sheet gussets fore and aft.

Cover with red Jap tissue. Spray with water before doping.

As for the wing, make a full-size layout of this. Cut out wing rib template from .015 sheet aluminum. With aid of template cut out ribs from  $\frac{1}{16}$ " medium sheet balsa. Wing tips are made from  $\frac{1}{8}$ " medium sheet balsa. Assemble wing in conventional manner. When cement is thoroughly dry, break wing in three places for polyhedral. With the aid of blocks and pins to hold wing in proper position, cement breaks, reinforce with  $\frac{1}{8}$ " sheet gussets. Let cement set overnight. Sand wing tips, leading and trailing edges and cover with red Jap tissue. Spray with water and give two coats of dope.

The stabilizer construction is similar to that of the wing.

The rudder frame is cut out of  $\frac{1}{8}$ " medium sheet balsa. Ribs are pieces of  $\frac{1}{16} \times \frac{3}{16}$ " medium balsa sanded to shape after assembly. The subrudder is cut out of  $\frac{1}{8}$ " hard sheet balsa.

Cover rudder and stabilizer with red Jap tissue. Rudder is temporarily tacked in place. The rudder is offset

a little to the left to counteract torque and to give the ship circle to the right in the glide. After model is adjusted for proper circle the rudder is then permanently cemented in place.

The prop is carved out of medium balsa. Blank is cut to dimensions given on Plate 1. After prop is carved it is cut in two at the exact center on an angle of about 15 degrees.

The hard balsa center block is then made. Drill  $\frac{5}{64}$ " hole in exact center of block for prop shaft. The ends of this block are cut to fit the blades. Metal fittings are made according to details on Plate 1.

Nose block is made of hard balsa. A hardwood dowel is inserted in proper position. Wood screw stop is mounted in this dowel.

Folding mechanism is simple. When rubber is wound, its tension draws the prop shaft backward, bringing the shaft arm beyond the screw stop. As prop revolves and rubber tension decreases, the wire spring draws prop shaft back to original position where the shaft arm catches on the screw stop, at which point the blades fold back.

Rubber motor consists of eight strands of  $\frac{1}{4}$ " flat 80" long. Using a four to one winder, put in forty winds and bring ends together. This takes up excess slack and acts as a rubber tensioner. Small rubber bands are slipped on each end to prevent rubber from crawling off bobbin. Use a good grade of brown rubber and keep it well lubricated.

### FLYING

Test model in calm evening air. Offset thrust line one degree to the right and about two inches down. Wing incidence is one-quarter inch. Glide by hand to find proper wing position. Now give rubber about seventy-five winds with a winder and launch into the wind. Model should climb against torque and glide in cir-



## About the SOLO CLUB and how to become a member

Feeling that there is a definite need for a means of recognizing those pilots who have experienced the supreme thrill of their first adventure alone into the blue on man-made wings, Air Trails has formulated and founded the SOLO CLUB.

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To obtain your sterling silver SOLO CLUB lapel wings and life membership identification card, comply with any of the following requirements and sign. Send with fifty cents to the SOLO CLUB, Membership Committee, Air Trails, 79 Seventh Ave., New York, N. Y.

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1. Dept. of Commerce license and number if held.....
2. F. A. I. license and number if held.....
- Or attach any of the following:
3. Evidence of military or naval air-corps service.
4. A letter from your instructor testifying to your solo flight, giving his rating and license number.
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cles of about 150 feet in same direction. Gradually increase the winds after each flight and make necessary adjustments until the model performs in contest style.

## BILL OF MATERIALS

### Fuselage

- 12  $\frac{1}{8}$  sq. x 36" hard balsa
- 1  $\frac{1}{8}$  x 2 x 18" soft balsa
- 1  $\frac{1}{16}$  x 2 x 3" hard balsa
- 1  $\frac{3}{16}$  diam. x 2" birch dowel
- 1  $\frac{1}{2}$  x 1 x  $\frac{1}{16}$ " sheet aluminum

### Wing

- 4  $\frac{1}{8}$  sq. x 24" hard balsa
- 2  $\frac{1}{8}$  x  $\frac{3}{8}$  x 24" hard balsa
- 1  $\frac{1}{8}$  x  $\frac{1}{2}$  x 36" med. balsa
- 2  $\frac{1}{16}$  x 2 x 24" med. balsa
- 1  $\frac{1}{8}$  x 2 x 18" med. balsa

### Tail

- 1  $\frac{1}{16}$  sq. x 36" hard balsa
- 2  $\frac{1}{16}$  x  $\frac{3}{16}$  x 24" hard balsa
- 1  $\frac{1}{8}$  sq. x 24" hard balsa

- 1  $\frac{1}{16}$  x 2 x 18" med. balsa
- 1  $\frac{1}{8}$  x 2 x 18" med. balsa

### Landing Gear

- 1 18" length .062 music wire
- 1 2 x 4 x  $\frac{1}{16}$ " birch plywood
- 4  $\frac{1}{4}$ " washers

### Propeller

- 1  $1\frac{3}{4}$  x  $2\frac{1}{4}$  x  $16\frac{1}{2}$ " med. balsa
- 1  $\frac{1}{2}$  x  $\frac{3}{4}$  x 2" hard balsa
- 1  $1\frac{1}{4}$  x  $1\frac{1}{2}$  x  $1\frac{1}{2}$ " hard balsa
- 1  $\frac{3}{16}$ " birch dowel  $\frac{3}{8}$ " long
- 1 1' length .040 music wire
- 1 1' length .062 music wire
- 1  $\frac{1}{2}$  x 2  $\frac{1}{16}$ " sheet aluminum
- 1  $\frac{1}{2}$  x  $2\frac{1}{2}$  x  $\frac{1}{32}$ " sheet brass
- 1 wood screw
- 1 #8 wire spring
- 3  $\frac{1}{4}$ " washers
- 1 bobbin

### Miscellaneous

- dope, cement,  $2\frac{1}{2}$  sheets Jap tissue,
- $\frac{1}{4}$ " flat brown rubber.

## Air Adventurers

(Continued from page 26)

Another new Topographer is Billy Feuerstin of Madison, Ind., for his description of the Dixie Airport located just outside Madison. Later on he will get his Photographer's award, since we are now giving out but one award a month.

We get some humorous angles in some of our letters. For instance, we have two swell pictures from Billy Archer of Detroit who seems to get about out there. However, he has his planes mixed a trifle because he calls one an Aeronca Cub. One can imagine what the Piper people would think of that. But never mind, Billy, you're only fourteen and there are a lot of people nearer forty who would call either the Cub or the Aeronca a "mail plane." Your Luscombe was right and your shot of the Airacobra at Selfridge Field showed good detail.

Another new Photographer is John Martin of Eaton, Ind., who sends in a nice shot of a Flying Fortress XB-17 taken at Wright Field. There's a navy Curtiss pursuit and a Douglas B-18 bomber in the picture, also, which gives you some idea of what goes on at Wright Field.

Three nice pictures come in from James Mundy of Madison Run, Va., taken at the Gordonsville Municipal Airport. The pictures are of a Beechcraft owned by Mrs. Randolph Scott which is flown by a Mr. Conklin.

We get a nice personal touch in a letter from Howard Smith of Wiscasset, Me., who writes: "I am applying for my Airplane Mechanics award and I sure hope I qualify. The picture of the model inclosed is that of a Comet Clipper Jr., and has made flights of well over a minute. Right now it is in the repair shop recovering from minor injuries received when meeting a tree for the first time. I hope it has learned a lesson."

That's what we call getting down to cases.

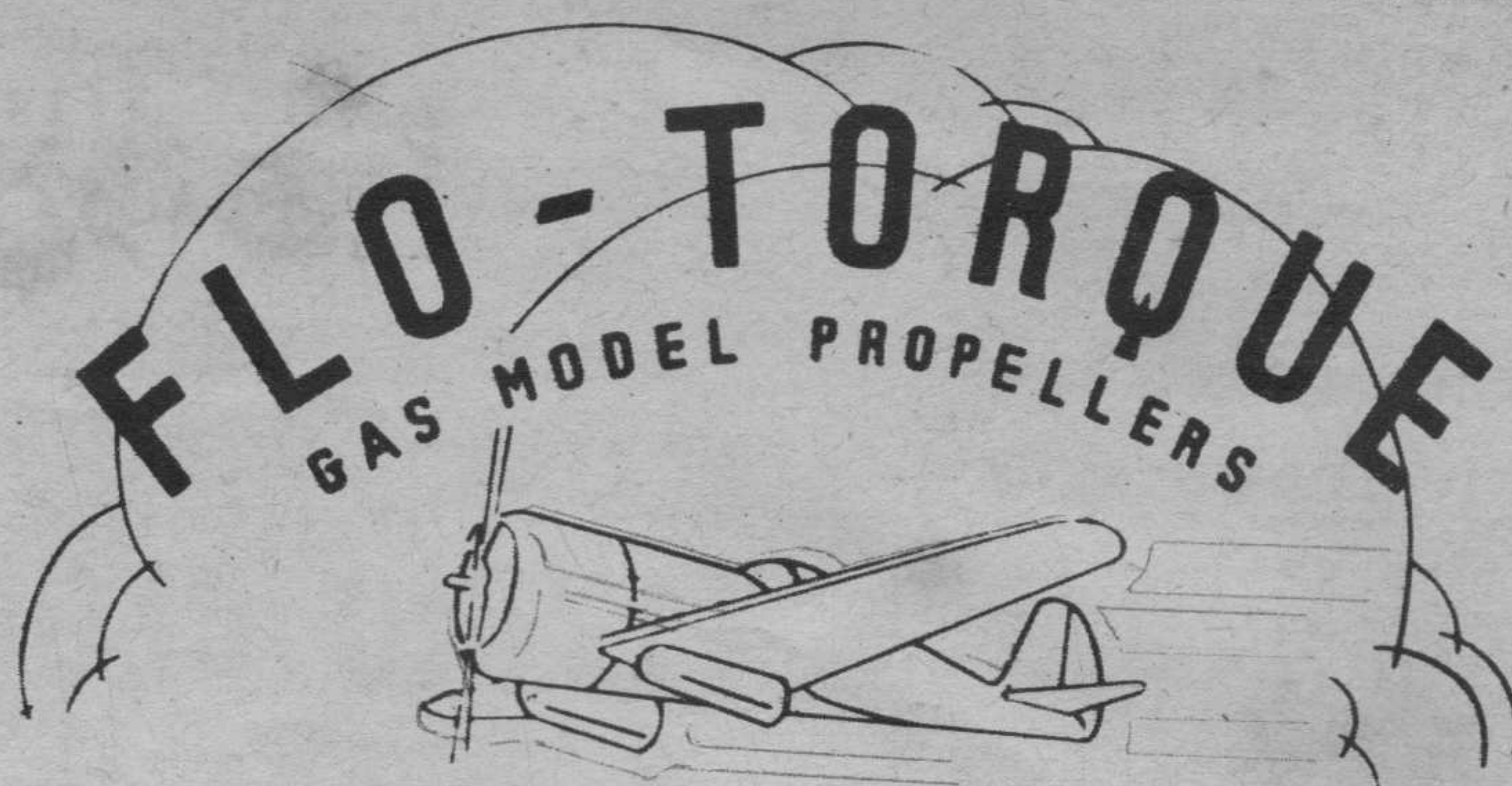
A nice letter from George A. Goss

of 203 S. Winooski Ave., Burlington, Vt., also includes an interesting picture of the wing of a Canadian-Colonial Airways Douglas DC-3. "I took the inclosed picture with a Falcon Magni-Vue camera and it shows in some detail the hundreds of rivets that go into the building of the wing. I was talking to Mr. Fred H. Smith, the pilot, who told me that the resistance set up by these rivets retards the speed of the plane by about twenty-four miles an hour. I am seventeen years of age and have had three and one-half hours of instruction in a light plane. I am greatly interested in airports in general, and we have quite a big one here in Burlington. I would like to hear from some other Air Adventurers who have the same interests."

From Miami, Fla., we get two neat snaps from A. Blechman of the Tides Hotel which he took down there. One showed a Pan-American plane of the Miami-Havana run at the dock. The other is a Fleet trainer on floats at the Goodyear Field. He has been sent his award. Blechman lives in Mount Vernon when he's not vacationing in Florida.

Edward Boguslawsky of Chicago is a real Air Adventurer. We have received a grand letter from him in which he really tells us what he thinks of us and Air Adventurers in general. "I like Air Trails," he says, "because of its simple way of explaining things, and I think it should be read by every air-minded citizen. In a recent issue the swell article by John DuBarry and Alexis Dawydoff was the truth all the way through. I'll bet after reading that article, 'Beware the Quickie Course,' many of the fellows seeking honest schools will know what to look for. Thanks to Air Trails for all that."

The interest in training is shown, too, in the many members who are catching up on their various courses as provided in our many examinations. We have sent an Engine Mechanics certificate to Leno Hooten, Jr., of Clifton, Okla. In another let-



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ter received from Hooten he has qualified for his Topography award and has included a well-written discussion on the contents of Air Trails magazine.

An Engine Mechanic certificate has been sent out to Miss Peggy Wallace of Pitcairn, Pa., who again has forwarded a neatly written report on her examination. We wish many of our male members could answer the Engine Mechanic questions with as much clarity as does Miss Wallace. If she does not become the logical successor to Miss Earhart, we miss our guess.

John Martin of Eaton, Ind., is a new Engine Mechanic on our rolls. William F. Lackman, Jr., of New York City sends in a picture of his model Ryan ST trainer which gains for him his Airplane Mechanic ticket.

We have a new Flight Captain in Canada, James Filby of 3 James St., Long Branch, Ontario. Anyone who doesn't get some of the old Long Branch air feel up there is certainly not trying hard. How Long Branch tangles the memories of so many old World War pilots!

A new Photographer in our list is Warren Anderson of Worcester, Mass., who sends in a shot of a Fairchild 24K taken while on a vacation in Maine. Warren, who is thirteen, uses the Kodak Bull's Eye camera and gets very good results with it.

Another Engine Mechanic who has been sent his ticket is Leonard Ernst of Bertrand, Neb. In another letter he sent in his papers on a discussion on Air Trails, and a Topography piece on a landing ground near Bertrand. Leo E. Owens of Carmel, Calif., has qualified for his Airplane Mechanic's award with a good photograph of his model Curtiss Hawk which he made some time ago. It is an exhibition model.

A very detailed drawing of the Burley Municipal Airport in Idaho comes in from Fred Watson of Paul, Idaho, and which most certainly wins for him his Topography award. This is one of the best we have received so far.

It's queer how often we receive a letter like the following from Donald Orr of Benson, Ariz.: "I was reading through one of your Air Trails the other day and for some reason the Air Adventurers column never had looked like it was worth reading, but I read through it and found it very interesting."

He goes on further to say that he would like to correspond with Air Adventurers all over the country, and we should rally round and write to Donald and let him see how much he has been missing by not reading this department and getting acquainted with our ideals. Box 255, Benson, Ariz., will get him, and we hope you Air Adventurers will pitch in and show this lad what it is all about.

Well, that's all for this month, and we hope the summer weather will heat a few more of you up and get the old writing arm working again. We get lots of letters, but we want more, of the kind that are interesting to others. There's your tip!

Your Flight Commander,  
ALBERT J. CARLSON.

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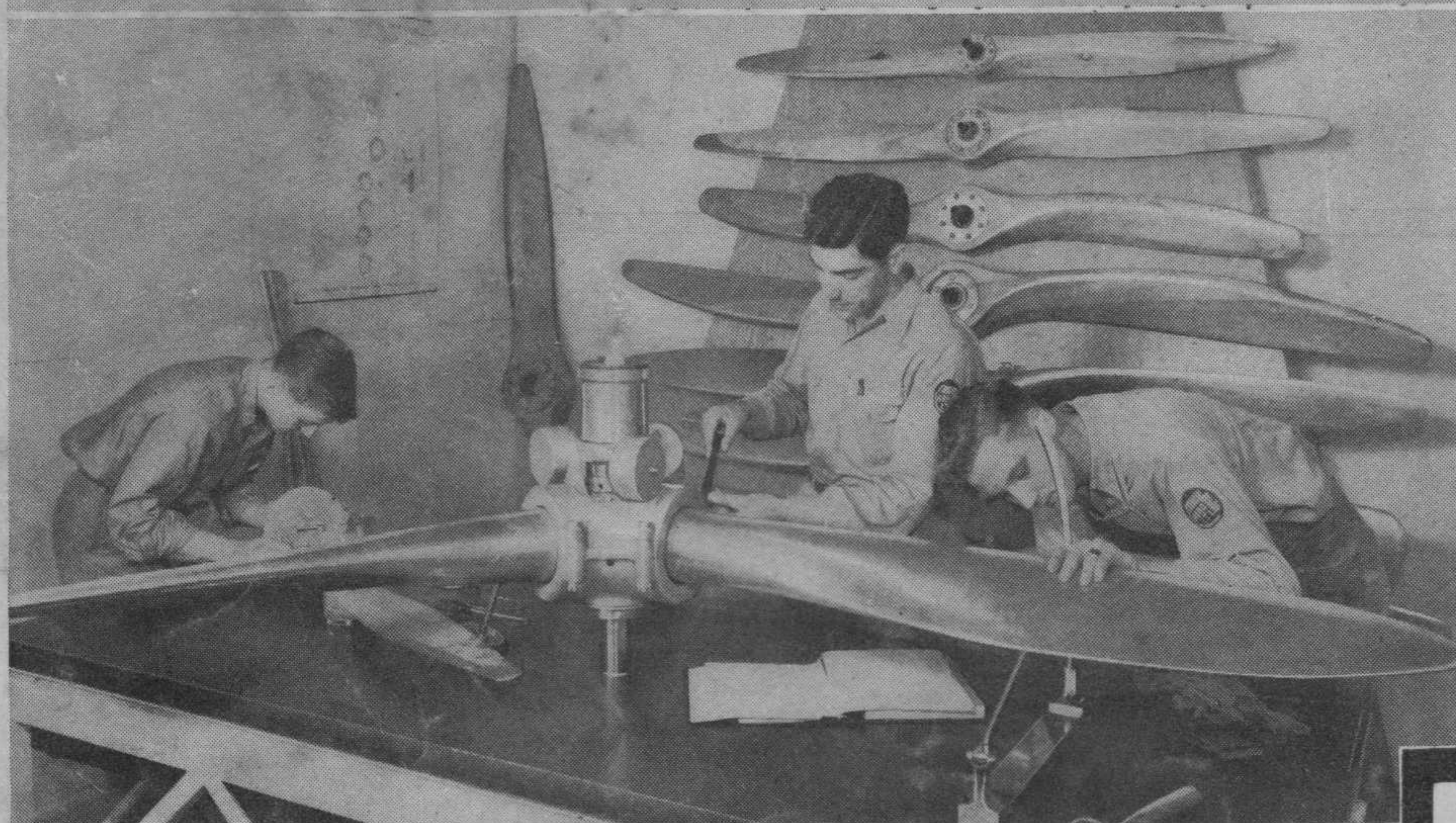
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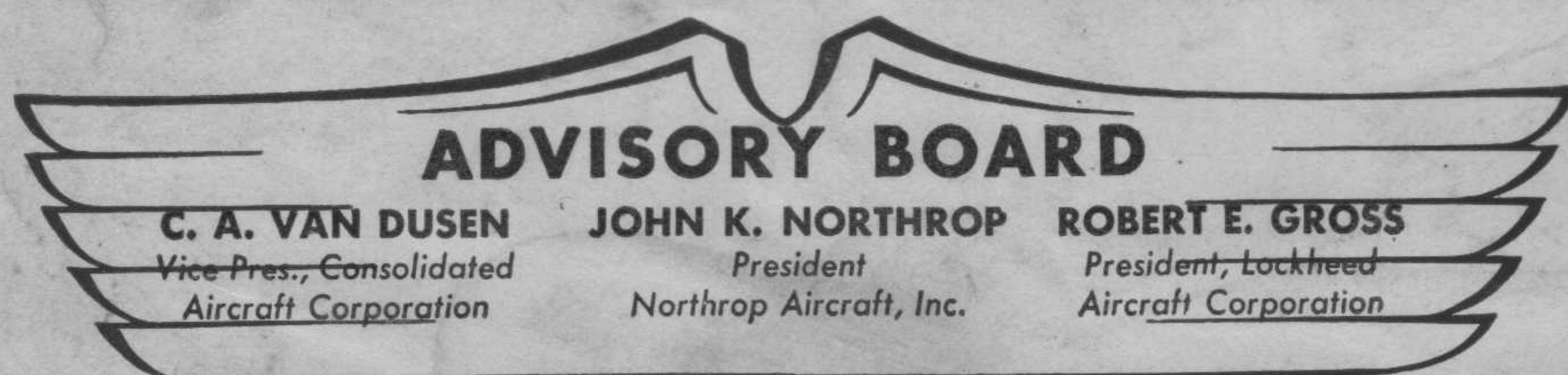
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