

## JARDUR 17 JEWEL AVIATORS SHOCKPROOF CHRONOGRAPH

No. 955



Exact Size

Send for Complete Catalog

(1) REGULAR ACCURATE WRIST WATCH — (2) TIME-OUT WATCH (Allows repeated startings) — (3) STOP WATCH (1/5th Split-Second Timing) — (4) TACHOMETER (Indicates aircraft speed from 60-750 M.P.H.) — (5) 30 MINUTE REGISTER (In minute recordings with the first two minutes marked in red) — (6) 60 SECOND TIMER — (7) 12 HOUR ELAPSED TIME REGISTER — (8) DEGREEMETER (For timing turns). Enclosed in a "Staybrite" Solid Stainless Steel Case with Unbreakable Crystal.

List: \$95.00—For a Limited Time Only—\$49.50, Delv'd.

## JARDUR AVIATORS WATERPROOF WRIST WATCH

WAFER-THIN—17 JEWELS—BLACK RADIIUM DIAL—SHOCKPROOF—NON-MAGNETIC—24 HOUR DIAL

One of the finest Aviators Waterproof, Dustproof and Shockproof Wrist Watches in an extra thin, Solid Stainless Steel, Non-Corrosive Case.

Black radium dial with Hour, Minute and Sweep Second Radium Hands.

An ideal timepiece for Aviators, Sportsmen, Military Men, Doctors, Photographers, etc.

List: \$60.00

For a Limited Time Only—\$31.50, Delv'd.



Model 200  
Exact Size

All Jardur Products are fully guaranteed and serviced for one year at no charge. Sold with a 10 day money-back guarantee.

Jardur Import Co., 21 West 19th St., New York, N. Y.

Exclusive Importers of Jardur Bezelmeter Aviation Chronographs and Stop-Watches

The Jardur Aviation Chronograph is the Official Timepiece of the entire crew of the 1941 Civil Air Mission to the Latin-American Republics by the Inter-American Escadrille.

## How to become an aviation mechanic

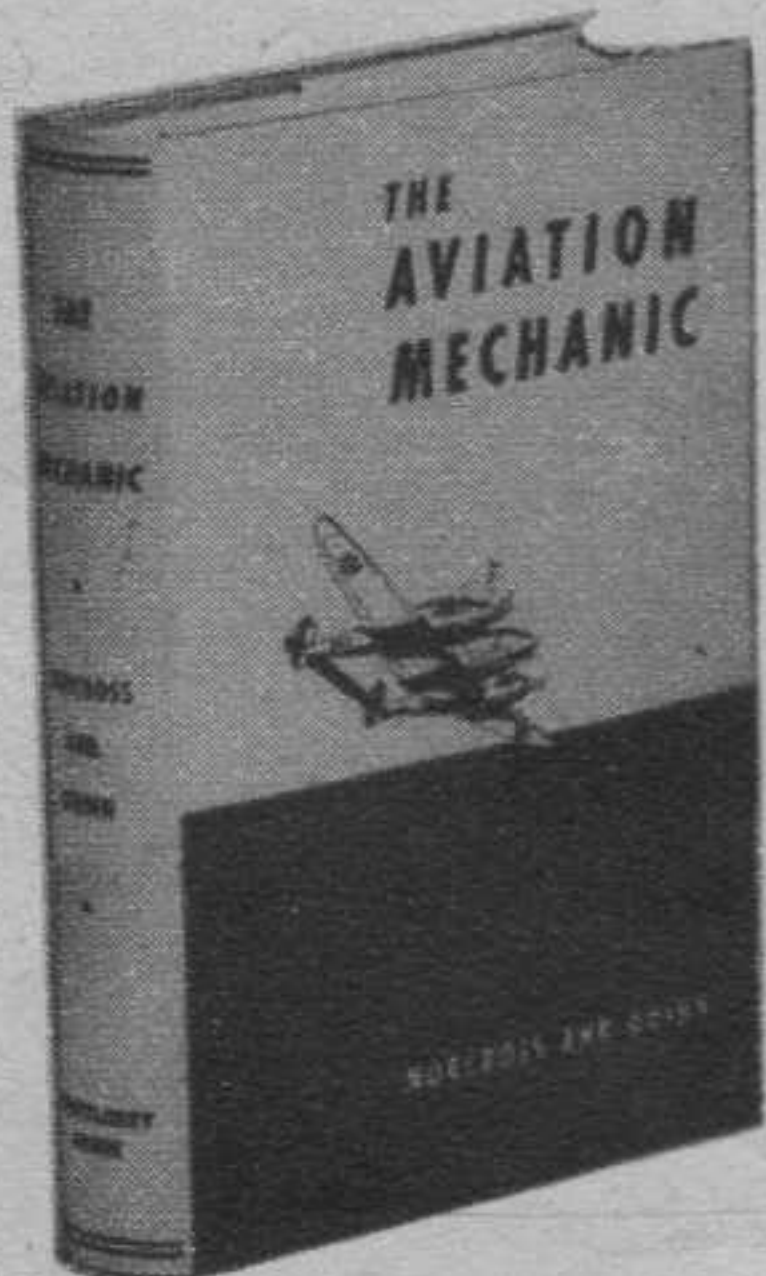
Told in this big, practical manual which gives simply and concisely the facts on construction and maintenance of modern airplanes of every type, large and small, civil and military—to help you learn the work and get a job at factory or airport.

Just Out!

## THE AVIATION MECHANIC

By Carl Norcross, Ass't Editor, *Aviation*, and James Quinn, Jr., Instructor, Manhattan High School of Aviation Trades. 563 pages, 537 illustrations, \$3.50.

This book covers everything the mechanic needs to know—requirements of the work, kinds of jobs there are, all about the plane itself, procedures of manufacturing, servicing, and repairing it, and the actual methods of every operation, from riveting parts to assembling planes, from patching a wing to inspecting a stratosphere. Shows you why as well as how, with fundamentals of aerodynamics and engine theory. (Enough for needs of students and instructors in Civilian Pilot Training Program.) 537 illustrations, with full, instructive captions. Complete manufacturing and service routines, inspection rules, etc., etc., everything to help you avoid false starts and prepare most directly for job you want. Also a modern reference guide for mechanics on the job. Look over a copy at once.



10 DAYS' EXAMINATION—SEND THIS COUPON

McGraw-Hill Book Co., 330 W. 42nd St., N. Y. C.  
Send me Norcross and Quinn—The Aviation Mechanic for 10 days' examination on approval. In 10 days I will send \$3.50, plus a few cents postage, or return book postpaid. (We pay postage on orders accompanied by remittance.)

Name.....  
Address.....  
City and State.....  
Position.....  
Company..... AT. 8-41  
(Books sent on approval in U. S. and Canada only)

## SHEETMETAL, RIVETING, WELDING ASSEMBLY COURSES

Write for Free Folder  
FAUST AIRCRAFT  
Sheetmetal Training School  
JERICHO, L. I., N. Y.  
(New York State License)

LET ME PROVE I  
CAN MAKE YOU  
A NEW MAN—

I changed myself from a 97-lb. weakling to winner of title, "World's Most Perfectly Developed Man." Let me prove in only 15 minutes a day that my secret of "Dynamic Tension" will give you powerful muscles, smashing strength, a handsome build. Write for my 48-page FREE BOOK "Everlasting Health and Strength."  
CHARLES ATLAS, Dept. 153H, 115 East 23rd St., New York City



LEAST EXPENSIVE—  
MOST SUCCESSFUL  
AIRCRAFT TRAINING

Fletcher Industrial Aircraft Training is based on a factory-approved pre-enrollment selection plan which determines for you the advisability of spending money on any training course. Nearly 4000 men have secured employment through this training. Send for booklet today.

Convenient Bank of America terms.

**FLETCHER**  
AIRCRAFT SCHOOLS  
118 Fletcher Bldg., Burbank, Cal.

GEARED TO THE NEEDS OF THE INDUSTRY

## Supercharged Pilots

(Continued from page 33)

breathing natural air he switches to the plane's oxygen and takes off.

Instead of using a pipe, which has been found to be dangerous, inefficient and wasteful, he uses a specially devised mask. This allows complete absorption of the oxygen and permits no chance dropping of a pipe. There is a device in the mask by which the pilot can speak into his microphone, thereby allowing him to speak without removing his mask.

The ascent to 30,000 feet is thus made with comparative lack of discomfort. No nitrogen bubbles form and there is ample oxygen for attack at high levels. How important oxygen is and how dangerous the lack of it may be, cannot be stressed too highly. The length of time that an aviator can stand such work varies with the individual.

This in turn can be aided by proper diet and living habits. It has been recommended that persons flying above 10,000 be furnished with chocolate bars, because a diet high in carbohydrates increases an aviator's ceiling from 1,000 to 2,000 feet. The reason for this is that more oxygen is needed to oxidize a fat than a carbohydrate because the fat must have extra oxygen to unite not only with the carbon to form carbon dioxide, but also with the hydrogen to form water. Of course, the actual eating of candy must be done prior to the ascent if a face mask is used!

Diets must consist of nongas-forming foods. The expansion of gas

in the intestines at 30,000 feet will be four times what it was at sea level. This expansion will not only cause interference with breathing but will cause distress. Animal charcoal is recommended for the absorption of gas.

Clean living, abstinence from excesses of any sort, and excellent physical condition must be the lot of any pilot who flies or fights at 30,000 feet. Even supercharging pilots before flight cannot remedy the effects of a sleepless night or a hangover.

Finally, what altitude should be considered as the limit to which one may fly? Flight surgeons agree that pilots must not ascend higher than 15,000 feet without oxygen, and better yet, 10,000 feet, if the flight is for some duration. For one thing, anoxia (lack of oxygen) may cause an injury to the brain that is permanent, and as has been pointed out, the effects of anoxia are so unapparent and so insidious that the results are present before they can be counteracted.

It is claimed that 40,000 feet is as high as our pilots can fly even with pure oxygen, adequate training and modern equipment. After that, stratosphere chambers, in which the pressure is maintained at a given figure, must be used. This does not seem to be a good idea, at present, because a single bullet piercing the chamber would cause the pressure to fall, terminating the engagement briefly and painlessly!

## Straws in the Wind

(Continued from page 25)

years. Why? Because it was a radically new design. An unusually large replica of the ship having a wing span of thirty-five feet was constructed and tunnel tested. Small items, but important ones from the standpoint of the aerodynamicist, such as the location of the two superchargers and Prestone radiator ducts were fully explored and investigated. Many times the shape, size and location of these "necessities" were changed. Nothing was left to guesswork. Consequently when you see a particularly complex installation on one of our new planes, remember that there is plenty of reason for its location and shape based on actual facts and research. At one time it might even have been a small piece of molded putty placed "just right" on a tiny wing of a model.

Another one of Lawrence Bell's ships, the Airacobra, prize package of all pursuit planes and virtually a "flying cannon," went through practically the same long, drawn-out research. Unique in that its motor was mounted behind the pilot with a drive shaft whirling its air screw, the Airacobra presented a new problem to designers and engineers alike because there was little or no data on such a type airplane motor mounting. Two versions of the ship were tested in wind tunnels at the University of Michigan engineering labo-

ratories. One model had the engine placed conventionally forward of the pilot and the other had the power plant located in its aft position as called for in the plans. The results of the tests proved conclusively that the "idea" was one that had merit. After similar exhaustive tests by Wright Field engineers at the Dayton, Ohio, laboratory, the army fell in agreement with the new radical design and construction work on the new deadly "flying gun platform" was given the go-ahead signal by the air corps. The results have been encouraging, for the Bell P-39 is regarded here and in Britain as a truly great airplane. It might never have been possible without that small model that proved its merit.

It is necessary to build several types of models of each airplane of new design, thus enabling engineers to study air flow, weight, lifting capacity, pressure distribution and other aeronautical features that affect flying qualities.

The army, at Wright Field, has two wind tunnels used for testing models which are built in the model workshops at the materiel division. One of the wind tunnels is five feet in diameter and the other is fourteen inches in diameter. The larger one is used for testing portions of full-size airplanes and wings, while the



smaller wind tunnel is used for testing propeller airfoils.

(Right now, nearing completion at this great aviation research center is the largest wind tunnel in the world. A forty-foot-diameter tunnel that will send air through its funnel at better than 400 miles an hour. It will lead to larger models and in some cases full-size airplanes to be tested here. The "big wind" was built at a cost of more than \$2,500,000.)

Skilled workers are hired by Uncle Sam to build the small models that are to be tested in these tunnels. Special templates are made so that the woodworkers can make the models to exact scale. Here is where the cost mounts up. Many hours are spent in cutting the wood to the desired shapes. Extreme accuracy is required, for discrepancies would make the wind-tunnel experiments of doubtful value. These models have to be correct to "hair-line" accuracy.

Lathes for turning out small round fuselage parts and other special equipment have been especially designed for the Wright Field wood-working shops, so that the wood craftsmen have everything at their fingertips to produce the experimental warplane model.

There are generally six types of models: the *performance and stability* model; *pressure distribution* model; *drag* model; *spinning* model; *flutter* model; and the *free-flight* model. Each of these models has its own particular function in producing results for a specified test.

The performance model is complete in every detail and is used to determine the general flying characteristics of an airplane. The pressure distribution model is only part of a model depending upon which portion of the airplane is under consideration, and it is used to learn the amount of pressure that is applied to that particular part of the plane when it is in flight. The drag model is used to find out the amount of resistance offered by the various parts of the model when subjected to the windstream. The spinning model is one tested to make certain that the airplane will recover from a tail spin. The flutter model is used to test the flutter characteristics of any part of the plane. (Flutter can be compared to shimmy in the wheels of your automobile.) The free flight model is used to determine the controllability and stability of the airplane in free flight. These models in themselves and in name represent the types of tests that are run with each in trying to determine generally the all-around performance of an airplane before it is built.

Perhaps the most interesting of the wind-tunnel tests is one that is not carried out at Wright Field. It is known as the spin test utilizing the spinning model. The test is carried out at Langley Field, the N. A. C. A. laboratories, and a vertical tunnel is being contemplated for Wright Field under the rapidly expanding air corps program.

The spin test is conducted in a vertical wind tunnel. The model is dropped into the tunnel in which there is air blowing upward to support its surface. The model is equipped with a delicate and intri-

cate clock-timing mechanism which moves its small control surfaces so as to cause the model to stop spinning. If the model straightens out into a dive, engineers know that the plane is safe for spinning. The model is caught in a net at the bottom of the tunnel.

There are two methods of supporting the performance models in the wind tunnels. One is the National Physical Laboratory's balance scale system, and the other consists of

wire attachments. The latter is used at Wright Field, but the new wind tunnel will incorporate the first process.

When the model is suspended in the wind tunnel by wires, the lift and wind resistance can be recorded on balances and scales outside the tunnel. Wires are attached to the wing of the model and as the wind is drawn through the tunnel the model is blown back—depending upon its own resistance—and as it

pulls the wires back it indicates on the balance scales outside the tunnel the amount of its resistance. Other wires attached to undersides of the wings indicate its lifting capacity by the same method.

Ordinarily tests in the tunnels are made at an air speed of 100 miles per hour. Using this figure as the basis for their calculations, engineers can learn approximately the speed and performance of any type airplane in existence today.

# AERONCA

## ACCEPTS ITS RESPONSIBILITY!

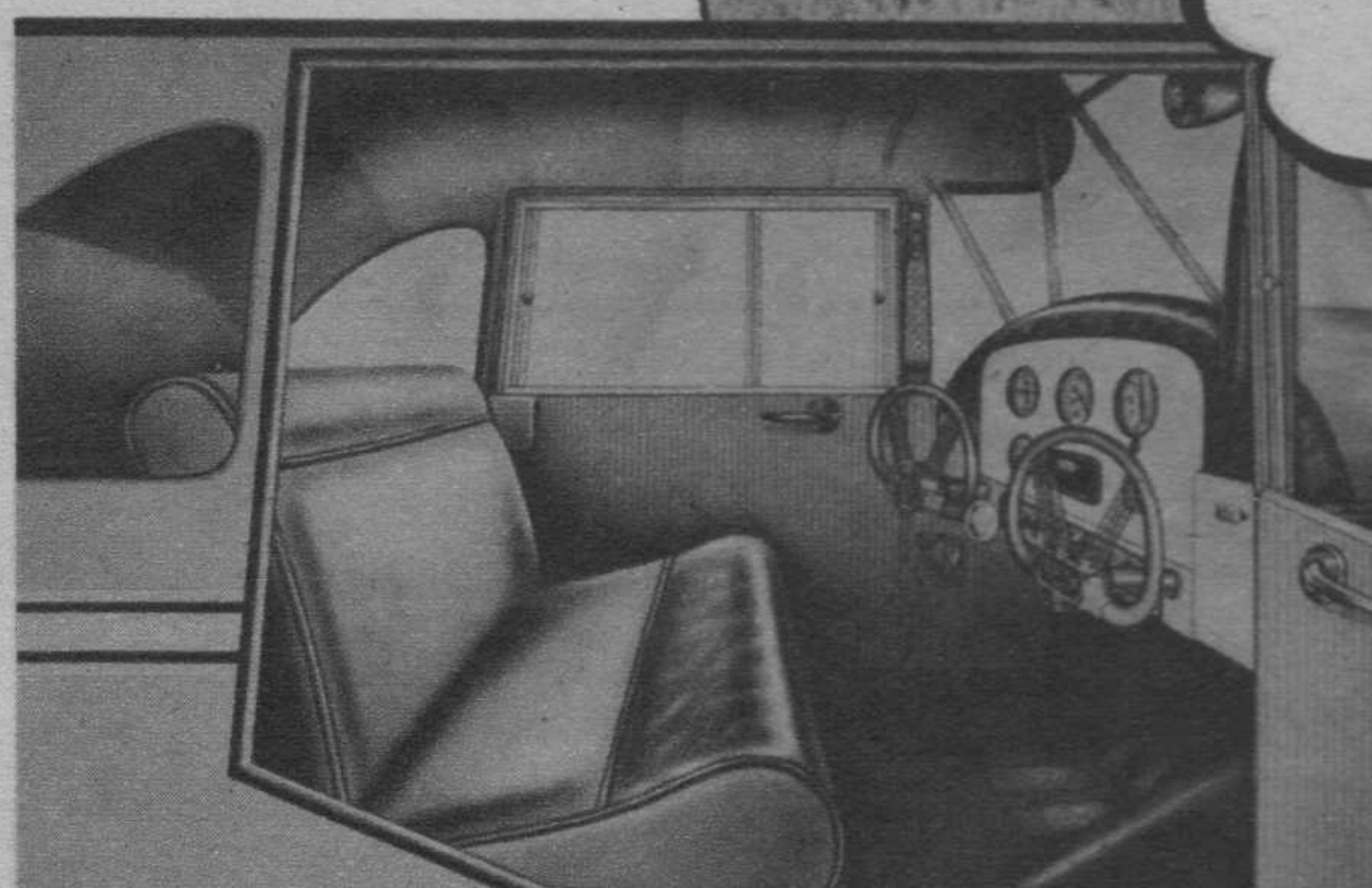
INCLUDE us in your list of assets, America—because Aeronca has been helping to make all America air-minded since 1929. We are now happy to accept our part in the national defense picture. Thousands of Aeronca planes are flying today—building up hours for the great reservoir of flyers who form a priceless pool of potential United States military pilots.

Many Aeronca Super Chief and Tandem Trainers are being specified by leading operators of the Civilian Pilot Training Program. Finer construction, greater dollar-for-dollar value and excellent flying characteristics make these planes the choice of men "in the know". Before you buy any plane, see and fly the Aeronca Super Chief. There is an Aeronca dealer near you who will gladly give you a FREE demonstration flight.



- Smoother
- Quieter
- More Stable

**THE ONLY ONE IN '29...  
THE FINEST ONE TODAY!**



AERONCA GIVES  WINGS TO THE WORLD

**AERONCA AIRCRAFT CORPORATION**

T-8 Municipal Airport, Middletown, Ohio. Cable Address: Aeronca, U. S. A.

Exclusive Export Agents  
AVIATION EQUIPMENT AND EXPORT, INC., 25 Beaver Street, New York City.

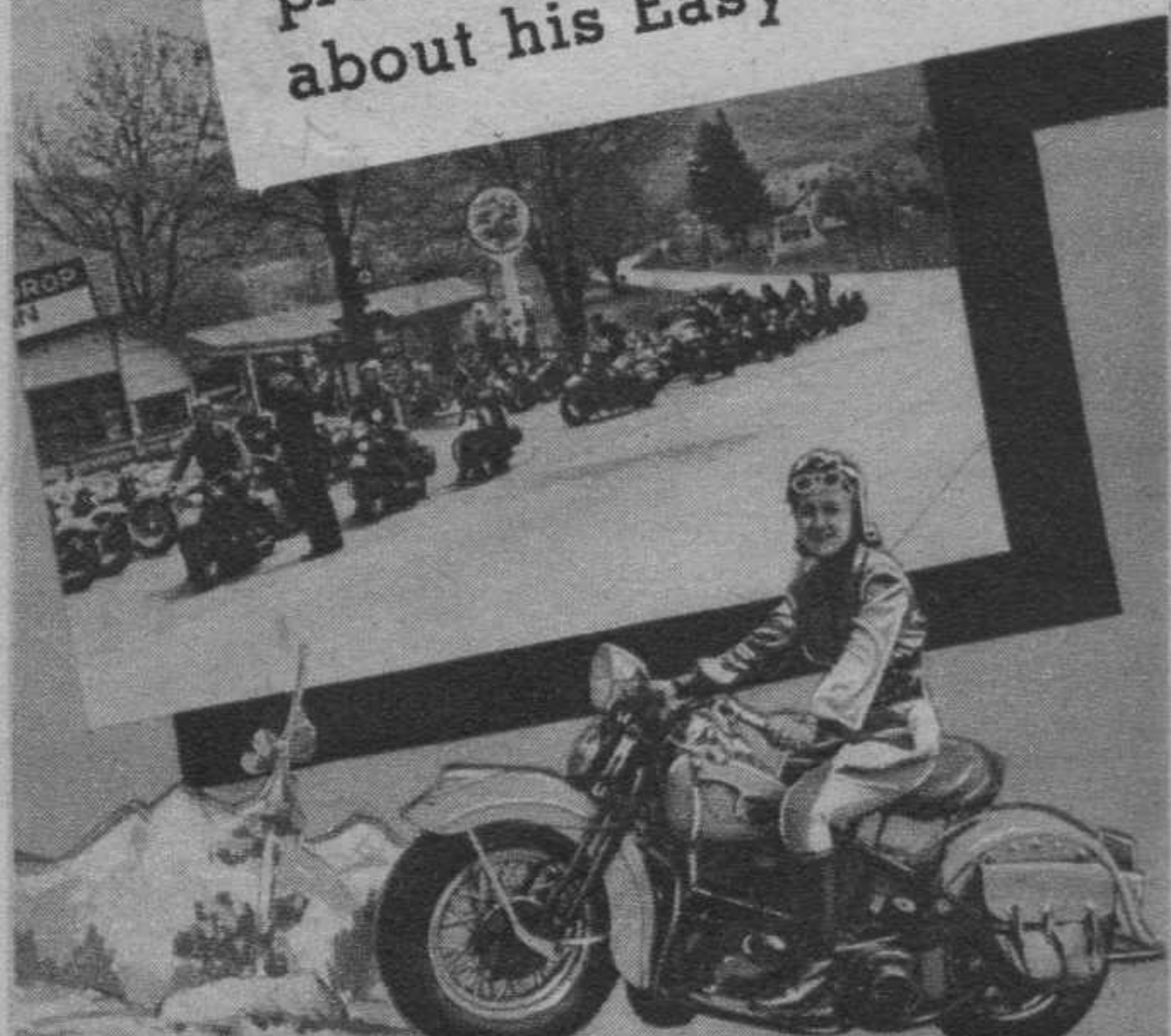


## Flying Box Cars

(Continued from page 29)



**ON A HARLEY-DAVIDSON**  
**YOU'RE** "flying high" when you ride a dependable Harley-Davidson. Whether you are zooming for a climb, banking on turns, or soaring along on top of the world, every minute is packed with rousing fun and thrills. Lots of excitement, too — as you pal with other "MC Pilots" at club runs, rallies, hillclimbs and other exhilarating motorcycle events. Visit your Harley-Davidson dealer right now — see the smart, improved models — and ask about his Easy Pay Plans.



**HARLEY-DAVIDSON**  
 WORLD'S CHAMPION MOTORCYCLE

**Send Coupon NOW**

HARLEY-DAVIDSON MOTOR CO.  
 Dept. AT, Milwaukee, Wis.

Send FREE copy of big 24-page "Enthusiast" magazine filled with thrilling motorcycle pictures and stories. Also literature on the new Harley-Davidsons. Stamp is enclosed for mailing cost.

NAME

ADDRESS

\$1,000 a day in insurance payments for the idle machine. From New York to Honolulu went new dies and fifty connectors from the Anaconda Wire & Cable Co., for a big construction job held up by a breakdown. To Portland, Oregon, from San Francisco a gear was sped by plane to a cannery, saving 5,000 tons of fresh fish. Several packages containing a plane shaft and weighing 1,000 pounds were flown from Wisconsin to Chile. Detroit shipped vitally needed auto parts weighing 2,000 pounds to Los Angeles. A 1,205-pound shipment of aluminum was planed from Pittsburgh to the Burbank, California, plant of Lockheed. Last January, a 750-pound Diesel crankshaft needed in a navy defense project at Wake Island was rushed by United and Pan American to the Pacific outpost.

All of which makes it as plain as a pikestaff that American aviation is capable, if given an opportunity, of heavy freight operations. With much of the world's air transportation commandeered by the military authorities and stepped up to blitz speed, indicating possibly the commercial pace to come after the war, the time to begin heavy sky trucking is, therefore, *now*, according to some experts. They point out that such operations not only would speed up defense, but would blaze the trails for post-war services which are certain to come. A vast cargo fleet, operated by the U. S. government or privately, is pictured by these men as shuttling back and forth between far-flung industrial points, where vital defense parts are manufactured, and assembling centers, saving days and weeks in the production of finished machines and weapons. And come war time, with its threat of air attack, these ships could operate with considerably more safety than surface carriers.

The possession of such a fleet in time of hostilities, it is further stated, would be invaluable. As Grover Loening, noted aeronautical designer, pointed out to the National Aviation Forum in Washington last year: "We have but to look at the photographs of the most recent German air invasions to see our old friend the trimotor Ju.52—one of the most familiar airliners in the world—doing yeoman service by carrying troops, parachute troops, demountable guns, ammunition and all manner of supplies just like nothing more than a flying freight car."

True, in time of war, the army would promptly take over about 400 of the big airliners now in operation, but expert observers insist at least 10,000 to 15,000 would be necessary in blitz tactics. For example, our defense outposts are yearly stretching farther from home frontiers, which means that to stave off lightning surprise attacks great masses of shock troops would have to be rushed from garrisons and cantonments in hours, not days, to be really effective. Some time ago the U. S. army dispatched several regiments from New York to Alaska, the trip taking thirty or more days, whereas forty to fifty commandeered airliners could have done

the job in less than twenty-four hours. In time of war the need of such speed is obviously imperative. With 1,000 planes like the new B-19 the army, for instance, could put down ten divisions in Brazil, 3,000 miles from the U. S. border, in fifteen hours. And no wonder—this great plane has a maximum weight when loaded of eighty-four tons and can carry forty tons of cargo, more than a railroad box car.

But we don't have to look entirely to B-19s; with minor alterations in design, the big combat fleets of Boeings, Martins, Douglasses and Lockheeds coming off the assembly lines today could easily be transformed into all-cargo carriers. Moreover, with a standardized blueprint, automobile and aircraft factories all over the land could turn out freighters like doughnuts in a doughnut factory.

As for the United States, the ratio of cargo carriers to combat ships is about one percent, but even as small as it is, the army has long operated one of the world's best air-freight services. "There is an air-freight operation right here in the U. S. and a very successful and efficient one," Mr. Loening also pointed out. "It is run by the U. S. army. Perhaps again, as it did with the original air mail, in 1919, the army will show the way. With no less than seven squadrons of specially equipped load-carrying aircraft some sixty in number, the army moved over 2,000,000 ton miles of freight in the last year, carrying all manner of supplies between the depots at Dayton, Ohio; Middletown, Pennsylvania; San Antonio, Texas; et cetera, to air fields and factories, loads including entire loads of engines, propellers, parts, munitions and even lead pencils. And, of course, all these craft are also fixed for conversion to troop carriers at short notice."

For a number of years, in fact, the army air corps has employed the "DSC," a typical Douglas liner resembling the DC-2, for cargo haulage. A low-wing monoplane, its cabin is thirty-three feet long, its loading door at the after end (some have sliding tops). A DC-5, three-ton carrier, also is in service. But soon to be delivered to the army for troop transport is the brand-new Curtiss-20C, largest twin-engined aircraft ever built in the U. S. Dwarfing in size all transports now operated by the domestic air lines, this ship has a wing span of 108 feet, is seventy-six feet long, is powered with two 1,700-horsepower Wright Cyclone engines (they are more powerful than any commercial transport engines and have electric propellers with three blades), and weighs 40,000 pounds.

Originally designed for substratosphere commercial use as the CW-20, this ship was to accommodate thirty-six passengers as against twenty-one in the current DC-3s, and about 6,000 pounds of cargo. The craft is all metal and designed with two concentric circles intersecting so that the floor joins their points of intersection, thus affording spacious passenger ac-

commodations above and cargo space below. The fuselage is "pressurized" (or supercharged) to enable the plane to cruise at 20,000 feet with equivalent "cabin altitude" of 6,000 feet. Maximum speed is 243 miles per hour. Introduction of cargo is done from a trapdoor at the bottom side. Ready to come off the assembly line of the Curtiss-Wright plant in St. Louis are 200 of these behemoths, all for the army.

It is doubtful, however, that were they being turned over to the air lines, as planned, they would satisfy needs for heavy cargo business. These needs call for a single-purpose, economical all-cargo ship—main bar to full freight operations. This craft must possess adequate hatchways, among other requirements; its floors must be well reinforced.

But in May, 1939, Benny Howard racer-designer-engineer, announced that he was mapping a flying box car; it was to be a high-wing monoplane, twenty-two feet long, seven feet high and seven feet wide, with a wing span of eighty feet. Tail was to swing out on hinges to permit loading of an 8,000-pound cargo from the rear. Cost of operations was figured at the time at twenty-six dollars per one hundred flight miles. Charles H. Babb, international airplane broker who converts and sells old passenger craft for use as freighters abroad, has designed an even bigger high-wing monoplane for all-cargo purpose; it is one hundred feet long, carries a payload of 11,500 pounds, and unhinges its nose for loading.

Air experts believe that one of the chief drawbacks to past realization of full freight operations has been the failure of shippers and carriers to differentiate between a strictly luxury passenger-express service and straight cargo operations. They contend that such haulage must be based on slower and therefore low-cost traffic. The emphasis, in their opinion, should be on the plane's lift rather than its speed. Indeed, today much of the big airliners is wasted in helping the take-off for long runs. Shorter runs consequently should be the rule, thus providing more payloads. Furthermore, in keeping with the lower standards of these operations, the latest, high-speed craft would not be needed, nor would the numerous and skilled personnel be required, since there would be fewer safety rules to fulfill.

These experts like to conceive an ideal future cargo carrier which might be called a streamlined tin goose, for the way these old trimotors pick up bulky cargoes in their slow-poke fashion is the marvel of air traffic men. Extending the concept further, the future air freighter might well, in their mental blueprints, be a behemoth like the B-19, geared for a comfortable 125-150 miles an hour, a great, huge-winged ship built to carry a whole lot mighty cheaply. It could, too, pull a string of trailers. There seems to be no question in the minds of traffic visionaries that these trailers will play an important part in coming air freight. It has been



pointed out, for example, that a Douglas DC-3, slowed to about 100-125 miles an hour, might conceivably pull eight fully loaded "box cars" designed on the same type of plane.

Tentative routes for these projected freight lines already have been worked out in some blueprints. One of the first to be suggested is, of course, that between New York and San Francisco, with vast feeder services tapping adjacent farming and industrial sectors along the way. The American Air Freight Corp., for example, has a pretty good idea of where it wants to operate. Some of the projected runs: Los Angeles to Boston, via Southern points, passing through New York from Washington; Los Angeles to Boston via mid-continental points, also up past New York; San Francisco to Boston via Chicago, Great Lakes points and New York; and Laredo, Texas, to Minneapolis via Kansas City and Chicago. As a matter of fact, the company was the first to file such planned routes with the CAB.

In fact, more than a year ago it was announced that the big air lines were angling to set up the framework for heavy freight operations. Some of the lines, like United, hired management engineers to make surveys. Chester M. Mayer, president of Air Express International Agency, Inc., which promotes air express abroad, is credited with starting the ball rolling, charging that Rail Express Agency (REA), which controls the ground pick-up and delivery service throughout the nation, did little to solicit air business.

At that time the General American Transportation Corp. warned the railroads that if they didn't wake up and combine with the air lines and REA to control the air cargo business, truckers might line up with the air carriers. This was realistically emphasized when the U. S. Freight Co., an important carload forwarder and motor truck operator, named an air freight consultant and mapped the nucleus for a ground system. Some of the railroads also got busy. The Kansas City Southern and the Seaboard Airline applied to the CAB for certificates to operate air freight services. Apprehensive, REA launched a gigantic survey among 100,000 shippers to ascertain future needs of the field.

Last January, an application of informal nature to operate transcontinental air lines strictly for carrying freight was filed with the CAB by the American Air Freight Corp., a newly formed California company. Before asking for a formal request for a certificate of necessity and convenience as air carrier under the "grandfather clause" of the Civil Aeronautics Act, founders planned to devote two years to surveying routes, evolving a ground pick-up and delivery service and developing suitable aircraft. Then in March, Colonel Edgar S. Gorrel of the Air Transport Association announced the formation of Air Cargo, Inc., which will engage in sky carrying of freight and express. The corporation is owned by American Airlines, Eastern Air Lines, Transcontinental & Western, and United Air Lines, which handle about ninety percent of today's air express.

Next after the need for ships of this type to expedite the dawn of widespread all-freight operations, are lower rates. Air lines and shippers together have clamored for a reduction in current high tariffs. Loening and others believe that cheaper charges will be obtained only when the REA monopoly is broken. In July, 1939, Loening demanded a slash in tariffs when, joined by air-line executives, he protested a REA request to the CAB for a certificate to act as a carrier, a request (later denied) which was allegedly made to formalize the agency's grip on air express. Loening at the same time urged formation of a new ground handling corporation to build fifty ships of eight tons immediately.

There are any number of opinions on desirable air freight rates. General agreement appears to be on one point: the larger the payload the lower the ton operating cost. The cost, it is declared by some, diminishes only slightly between nine and one-half and thirteen tons, and in this bracket hovers around five cents per ton mile. Oft-mentioned ideal rate for air cargo is ten cents a mile. REA shippers today pay eighty-six cents per ton mile compared to twelve to eighteen cents by rail. Curtiss-Wright figures cited a flying cost of 6.14 cents per ton mile for flight legs of 200 miles or 5.29 cents for 800 miles. According to these figures, based on operations of the CW-20, with all additional costs, including pick-up and delivery, a ship could operate competitively with railway express. As a matter of fact, stripped down to haul cargo from the River Rouge plant to assembly lines, old Ford geese got the rate down to ten to fifteen cents.

Much talk on a better rate structure has centered on the contention of some experts that a delayed or "deferred" service would solve the problem. Opponents of this view, and foremost among them are REA executives, reply that while American shippers want lower rates, they do not want deferred deliveries.

There is much to be said on both sides, as can be seen, but it's likely that the present national defense emergency will have more to do with settling the question than anything said on what now might be called the side lines. Right now some of the heaviest air freight traffic has to do with shipments to far-flung military, naval and defense projects—machinery, vital parts, bundles of blueprints, supplies, et cetera.

And if war comes, scores of big commercial airliners will promptly have their innards yanked out to make room for troops or munitions. And, any way you look at it—whether we get in or not—cargo ships are bound to take up the slack of military production when the conflict is over. Hundreds of bright, new bombers on the assembly lines will be converted to peaceful purposes. Big business will not overlook its opportunities. Glenn L. Martin has pointed up the whole question with his boast: "Give me enough money to build a ship big enough, and I will build a plane able to carry wheat to Europe cheaper than ocean-going ships!"



# COMMERCIAL AVIATION

*wants more*

# LINCOLN TRAINED PILOTS

For every qualified Pilot Instructor trained at this Lincoln School, a choice of several immediate positions has been open to them. These Lincoln Graduates step into good-pay responsible positions as fast as we can train them. But MORE are wanted...many hundreds more.

Here's your opportunity to prepare for a good-paying professional flying position. If you've had no previous flying experience, Lincoln's Commercial Pilot's course taken in combination with our Pilot Instructor Course, will prepare you for one of these good positions. If you now hold a Private or Commercial Pilot Rating, you can secure here the additional flying time necessary to qualify for your Instructor Rating.

Our Pilot Instructor Graduates are receiving starting salaries of \$250 to \$350 a month. Advancement is rapid and the experience gained as Flight Instructor, serves as a valuable stepping-stone to an Airline Pilot's position.

All Flight and Ground training at Lincoln is fully Government Approved. Large fleet of modern training planes, BOTH Primary and Advanced. Every facility to prepare you thoroughly for a responsible piloting position. Courses also offered in Aeronautical Engineering and Government Approved Airplane & Engine Mechanics Training.



Here's a REAL opportunity for you. If you would like to prepare for a Piloting career, let us send you complete information. MAIL COUPON TODAY!

**LINCOLN**  
AERONAUTICAL INSTITUTE  
188 Aircraft Building, Lincoln, Nebraska

Lincoln Aeronautical Institute,  
188 Aircraft Bldg.,  
Lincoln, Nebraska


I'd like to have complete information  
about your career training for pilots.

Name .....

Address .....

City ..... State .....





**8 MILE RANGE — WIDE VISION**

## BINOCULARS

15 Days' Free Trial  
Postpaid or C.O.D. **\$4.75**

Comes complete with case and straps. Well ground powerful lens. Easily focused for all distances and eye widths. Latest features. Ideal all-weather binoculars. Guaranteed. If not satisfied after 15 days' trial, money refunded.

VOGUE BINOCULAR CO., 8420 S. Ashland, Dept. 120, Chicago

Prepare  
Now for

## YOUR LICENSE

Airplane mechanic's home-study course \$1.25. Engine mechanic's course \$1.25. Both courses \$2.00. Postpaid. Also sent C.O.D. Contains all license questions with answers and accurate diagrams. Helps you tremendously in your mechanic's as well as Pilot's License Exams.

**"250,000 Aircraft mechanics needed for U. S. Defense"**

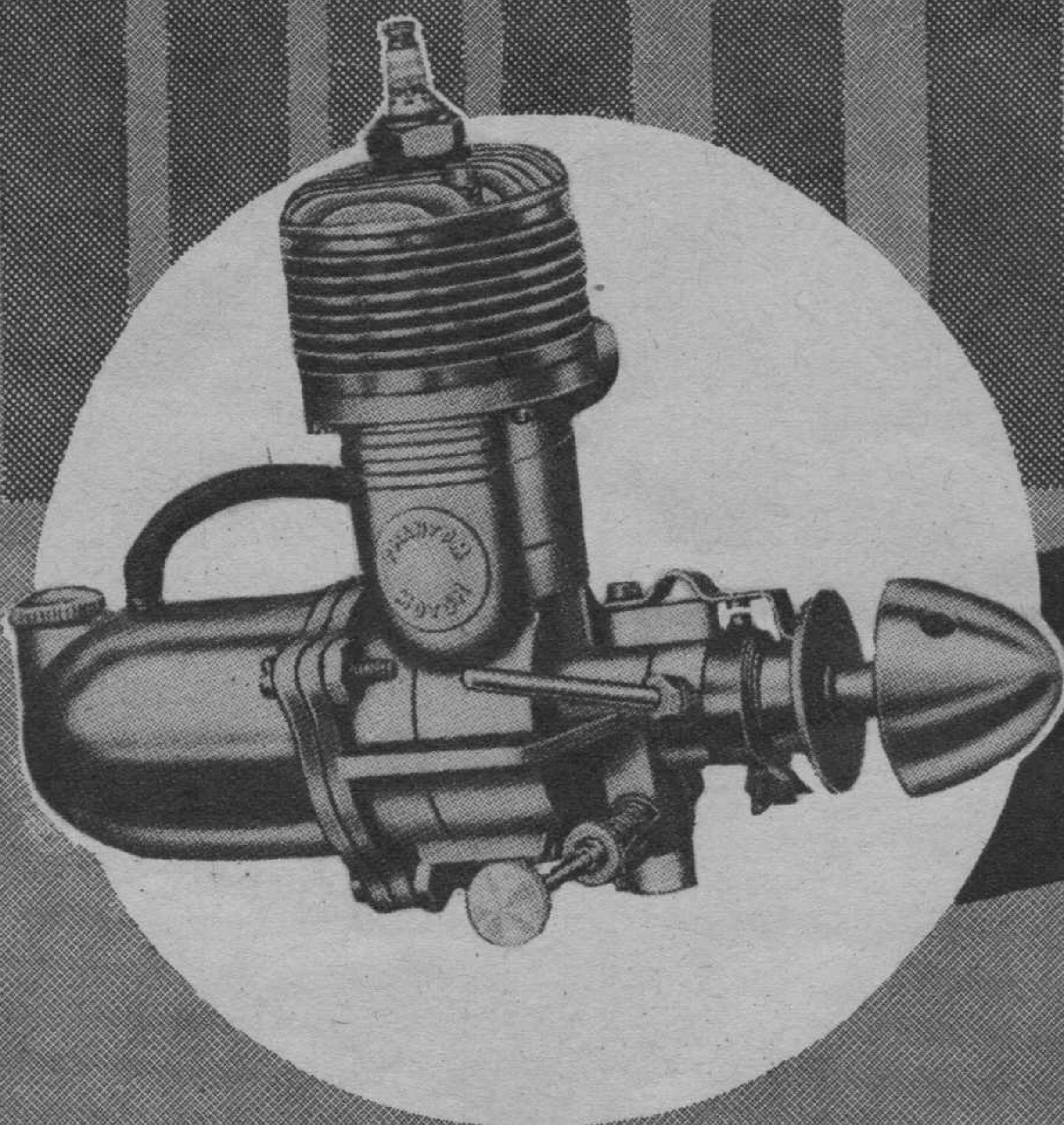
**MEYER ENGINEERING**, Hempstead, N. Y.  
Box 8-J



# PHANTOM

## AMERICA'S BEST CLASS "B" MOTOR BUY

SOLD TO YOU AT FACTORY PRICES!



### BULLET SPECIFICATIONS

1/7 h.p.; 2 cycle rotary valve; 3/4" bore; 5/8" stroke; .275 cu. in. displacement; bare weight 4 1/2 oz. Gravity feed carburetion; Diamond bored crankcase; hardened steel timing cam; solid steel case hardened crankshaft; die cast Magnesium connecting rod; lapped alloy steel piston; fully equipped heavy duty radial mounting.

FOR ONLY  
**7.25**

A thousand thrills await you with the new official record holding Phantom Torpedo and Bullet. You won't believe your eyes when you see their streamlined beauty, or your ears when you hear the drone of their power packed engines. You will say it isn't possible to sell such fine engines for so little. But it is. That's because Phantom engines are sold direct from factory to you...No in-between profits, you save the difference.

We challenge anyone to show you finer motors that can be bought anywhere near our new prices.

Order now! Start winning some of those contests you've been dreaming about. Fill out the handy coupon below and we'll have your engine rocketing on it's way to you in less than 24 hours after we receive your order.

### NEW VALVE PRINCIPLE AND IMPROVED CRANKSHAFT IM-PROVES PERFORMANCE

Undreamed of performance by use of new SQUARE VALVE increases engine performance as much as 15 to 20%. Square valve stays open longer than old round type. Lets more gas into gas chamber, thereby developing more power.

(Torpedo only).



### TORPEDO SPECIFICATIONS

1/7 h.p. @ 14,000 r.p.m.; 2 port 2 cycle type; bore .725; stroke .724; static thrust 30 to 32 oz. plus; displacement .2989 cu. in.; weight 4 3/4 oz.; downdraft carburetion; plus size Magnesium gas tank; Champion V-2 spark plug, exclusive offset principle... easier starting, more power; metal enclosed condensers; additional crankcase fins; Diamond bored crankcase; oversize anti-friction bronze bearings; lapped alloy steel piston; die cast Magnesium connecting rod; special new type heavy duty radial mounting.

FOR ONLY  
**10.95**

## PHANTOM MOTORS

800 East Gage Ave., Los Angeles, California

PLEASE RUSH THE ITEMS CHECKED BELOW:

- |  |  |         |
|--|--|---------|
| <input type="checkbox"/> Money-order enclosed  | <input type="checkbox"/> Send C. O. D. |         |
| <input type="checkbox"/> New improved 1941 Phantom "Bullet" complete with coil, tank and condenser |  | \$ 7.25 |
| <input type="checkbox"/> New Super Phantom "Torpedo" engine complete with coil, tank and condenser |  | 10.95   |
| <input type="checkbox"/> Special 11 inch hardwood propeller  |  | .49     |
| <input type="checkbox"/> Miss Tiny Kit, Propellor and Phantom Built "Bullet"                       |  | 11.95   |

Add 3% if delivery point is in California

Prices Slightly Higher in Foreign Countries

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

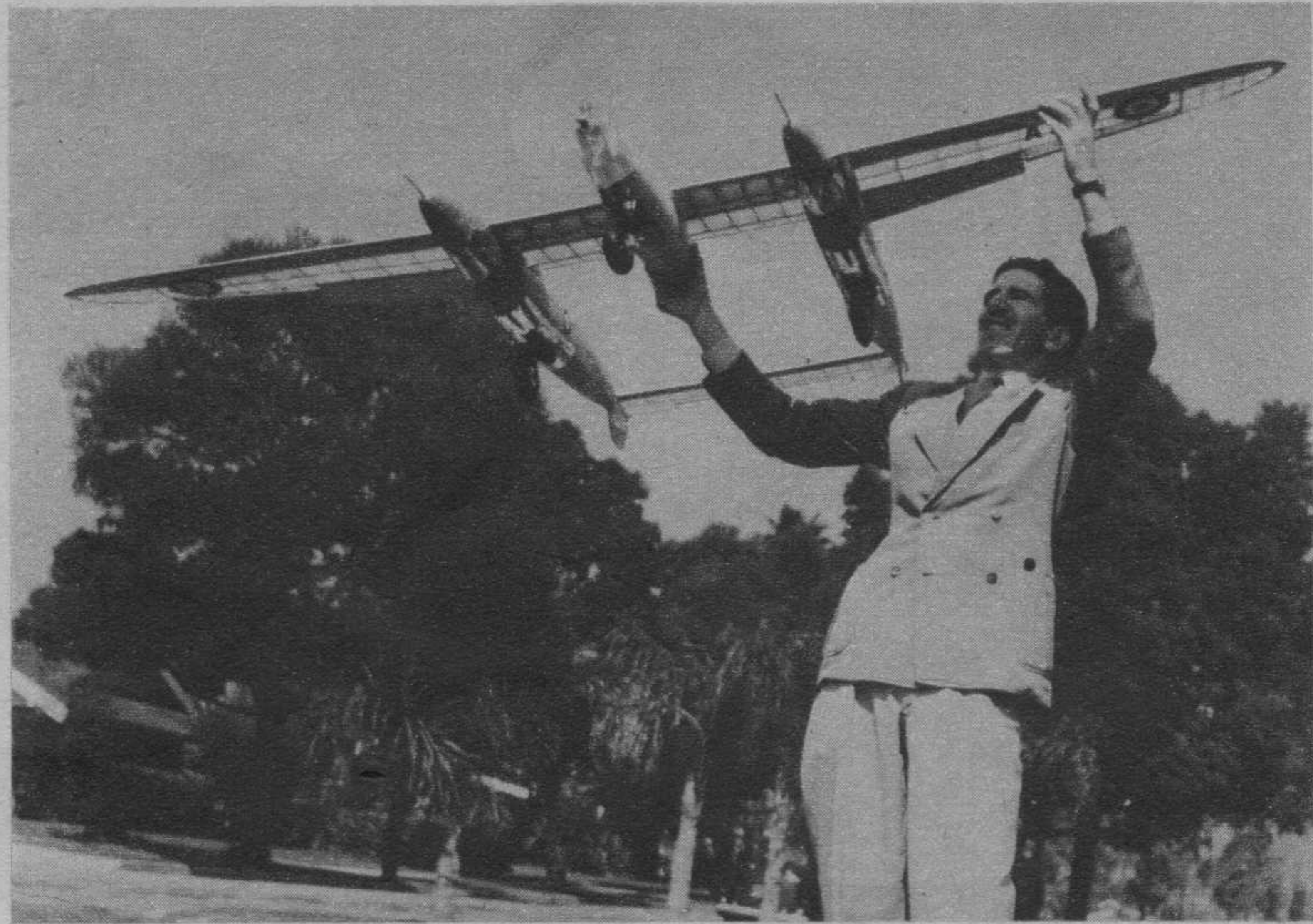
STATE \_\_\_\_\_

A-20





Fun for young and old. The Potter family of Alexandria, Va.—all three generations of them—at Berlin, N. J., meet. Potters are contest goers.



H. S. Dion, Glendale, Calif., thinks his ship unusual enough to publish. We agree. Don't you? Inspired by P-38, has pusher and tractor propellers.

# Model matters

Gordon Light's Dope Can. Moon's On The Field.

**THE DOPE CAN.** (By Gordon Light.) Recently newspapers carried an interesting shot of forty four-engined Douglas transports lined up outside the American Airlines hangar at LaGuardia Airport. Complete with the airline's insignia and license numbers it looked like a genuine collection of the company's rolling stock. But both caption and close inspection revealed that the airplanes were models lined up for a trick photo. Very clever!

Roy Marquardt has finished his graduate study at Cal Tech and is working in the aerodynamic department of Douglas. We hope he has time to keep up his low-speed wind tunnel experiments so nobly begun a few years ago.

The motto of the South Jersey Gas Model Airplane Association is "Clean Altitude Above All"—which is a good thought for anyone interested in getting more than a few prizes out of the hobby.

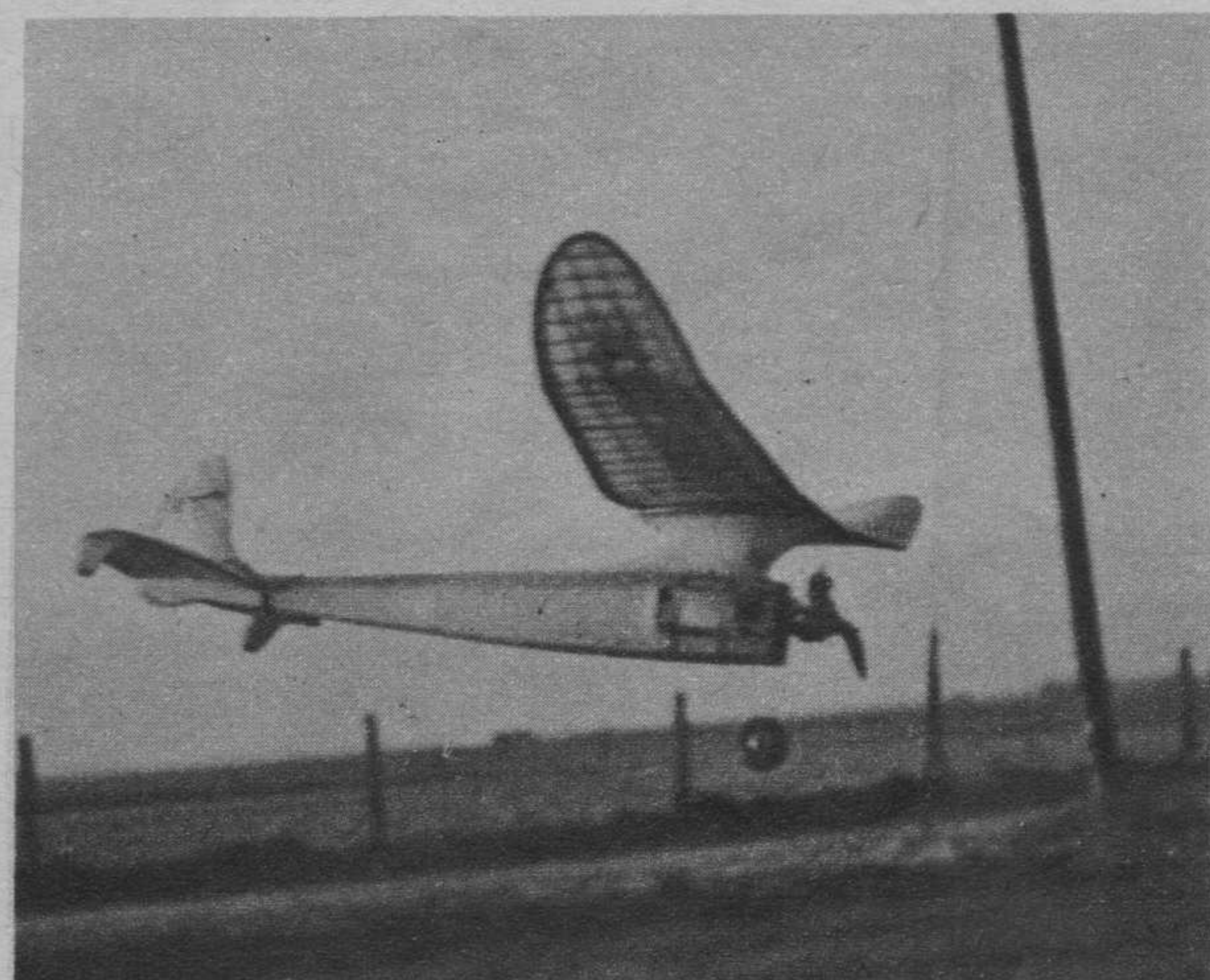
The monthly newspaper of the Fresno Gas Model Association is designed to circulate news and ideas among the clubs on the West coast. R. O. Spacy (editor) and E. Weymouth (assistant) put out the first issue last April. F. G. M. A. has a membership of nearly seventy-five with a goal of one hundred by the end of the year. In November, 1940, the club was formed by five builders who thought a club offered the maximum in model fun. John Drobshoff is one of the most successful FGMA members in contest circles. He was the West coast champion in 1940 and won the Air Trails Trophy at the Chicago Nationals.

The hobby lost one of its stalwarts in Robert A. Romeiser. He died last May in Indianapolis after a four-weeks' meningitis infection. (Turn to page 59)

## MORE ABOUT THE BUZZARD BOMBSHELL.

In June Air Trails the featured gas model kit survey "Your Choice of Kits," mentioned Aircraft's Buzzard Bombshell as a "boxlike contraption." Although these words of an experienced builder who himself regards the Bombshell highly enough to fly one in contests are modeler's lingo, we fear some readers will give them a derogatory meaning.

We want to go on record as saying the Bombshell is one of the best-looking and possibly the finest performer published in Air Trails this past year. Anyone who recalls the Bombshell plans in the October 1940 issue knows what a swell job it is. We said then, "Our nomination for all-American gas job is this Nationals Class C, Open, record smasher."



Robert Johnson, Bloomingdale, Ill., supplies this action shot of his Comet Sailplane in a glide. Note single wheel.



Elmer Powell and his Brown-powered Scientific Flagship. The smaller ship, his own design, is powered by a Bantam.

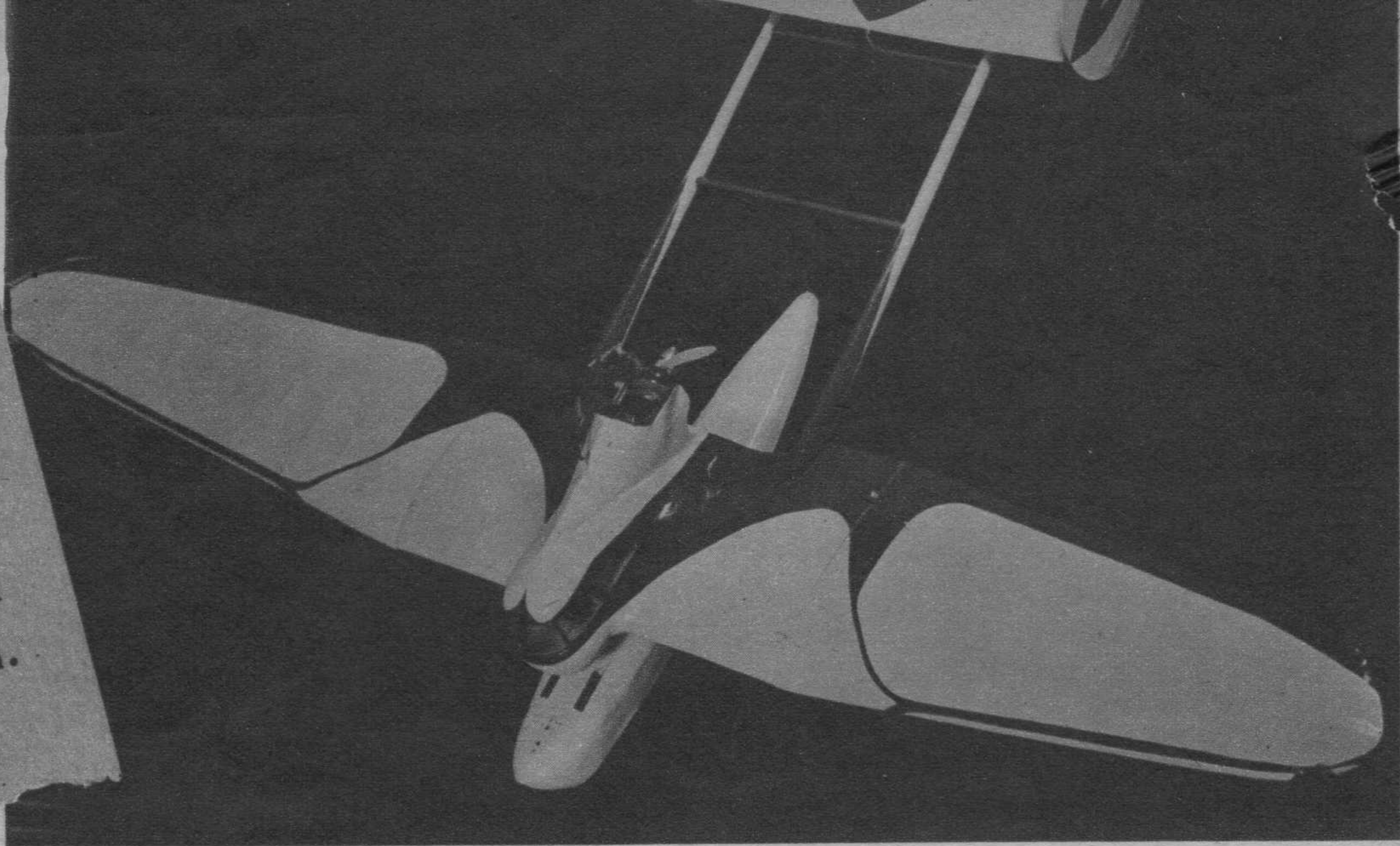


Photographer says, "This model astonished the experts. Almost flew out of sight on 20-sec. motor run." F. Horsch.



# MODEL TINTYPES

Ideas both good and "screwy" abound  
in this latest dream ship collection.



This tricky number features detachable outer wing panels, pusher engine, twin booms, kitchen sink—



Art Gray and prize "finish" model at Berlin, N. J. Has three-bladed prop, Super Cyclone.



How Gray's propeller works. Each blade is hinged near prop hub and folds back in glide, thus reducing air drag.



Centrifugal force holds folding propeller blades in position when the motor is running. Hinges must be strong for safety.

Jack Powell and Bantam-powered gas model won Flight Command best finish contest.



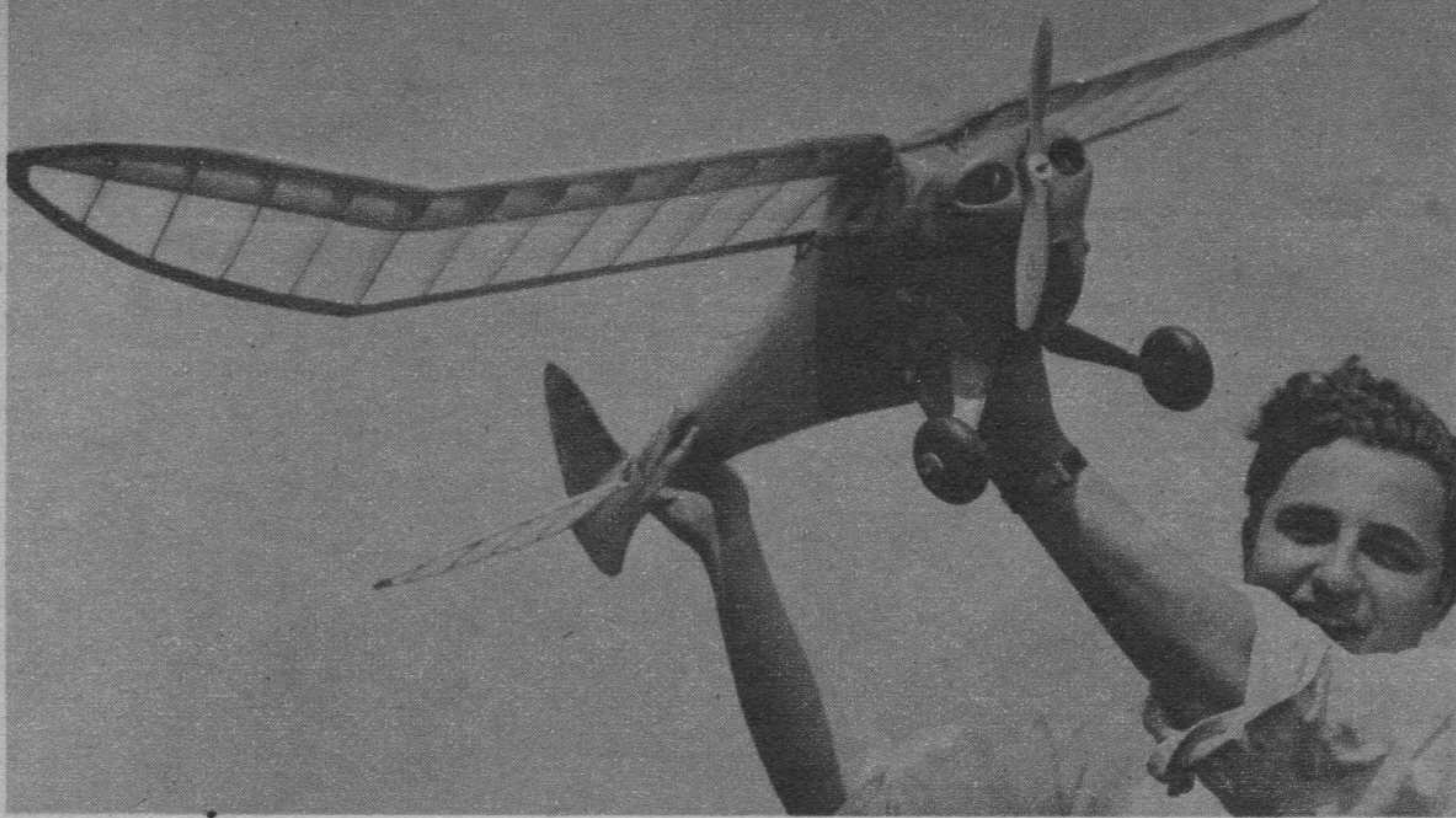
We like this one for its design. Crutch construction, sheet-balsa fuselage, "U" stabilizer, no rudder. Cliff Travis.



This Class A pusher is Robert Harrison's dream ship. Powered with a Megow 199, it flies well. One wheel and fin skids.







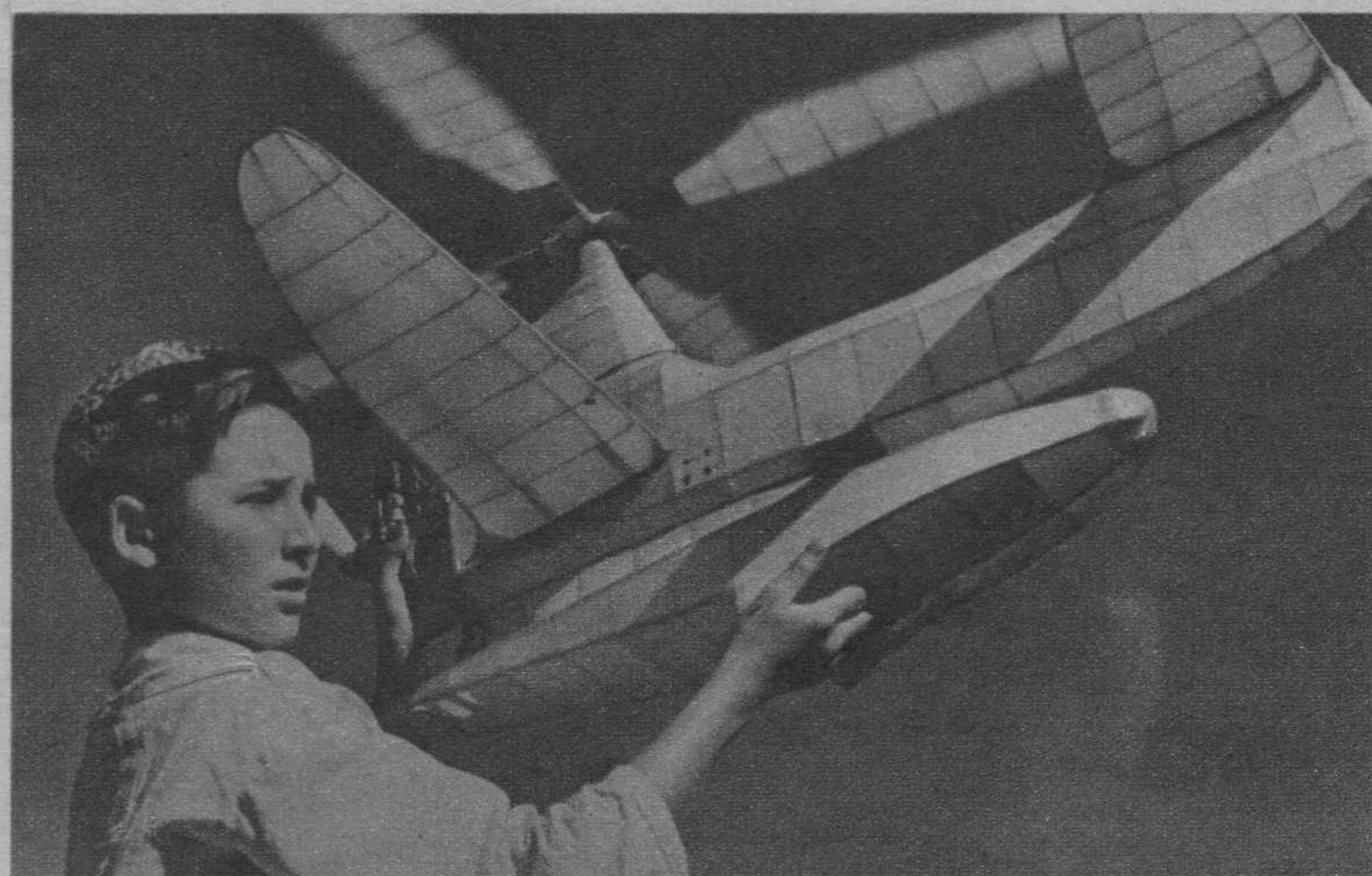
John Ullman's Class A, Elf, Twin-powered job looks something like a light plane with that nose cowl he's worked out. Nice model, we would say.



Leon Shulman's Super Zombie has inclosed engine, retractable monowheel. Skin friction is reduced by lack of fuselage area. Note folding prop.



Sal Taibi just got a job with the N. A. C. A., but had to take off twenty pounds to do it, hence the sweatshirt. Oh yes, that's a gas model, too.



This Russian what-is-it could be an autogyro, or anything else. Apparently, it's a tail-first, pusher seaplane. Think you'll make one?



George Reynolds, Jacksonville, evidently likes parasols, and the higher the better. Maybe it's because of that hot Florida sun. Ohlsson 60.



It's a stick-up. Charles Richburg, Tampa, uses a four-foot stick and a single-strut wing mount on his job. It's a neat trick—if you can do it.

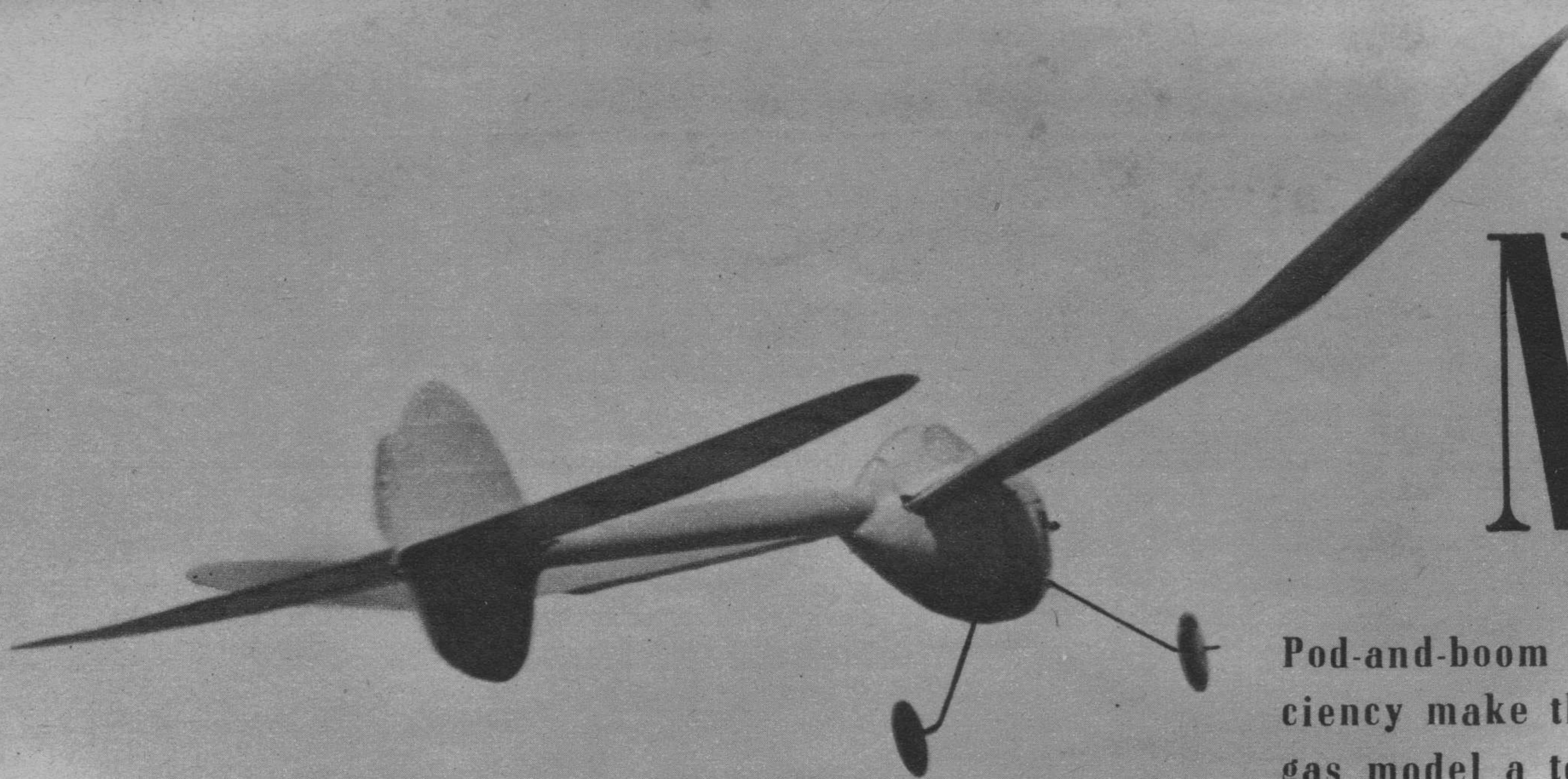
Frank Hernandez made this snappy racer-type model. Has cockpit with pilot, shielded wing lights, spats. Flies nicely.

Geodetic wings distinguish Elmer Wassman's gas job. Spars are eliminated. On the whole, it looks a whole lot easier.

One way to launch a gas buggy. Mac Jurist just grabs his Atom job by boom and let's go.



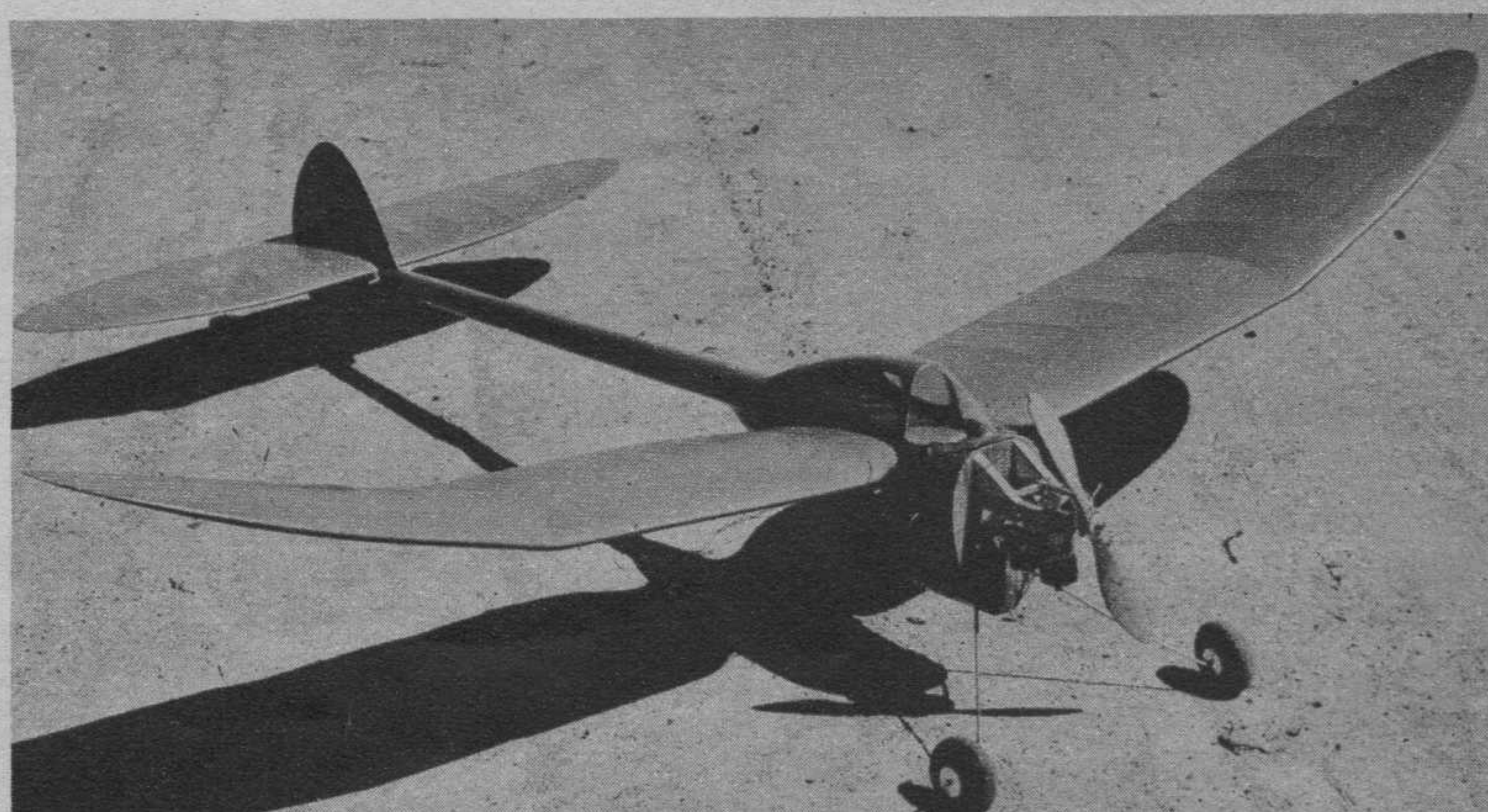




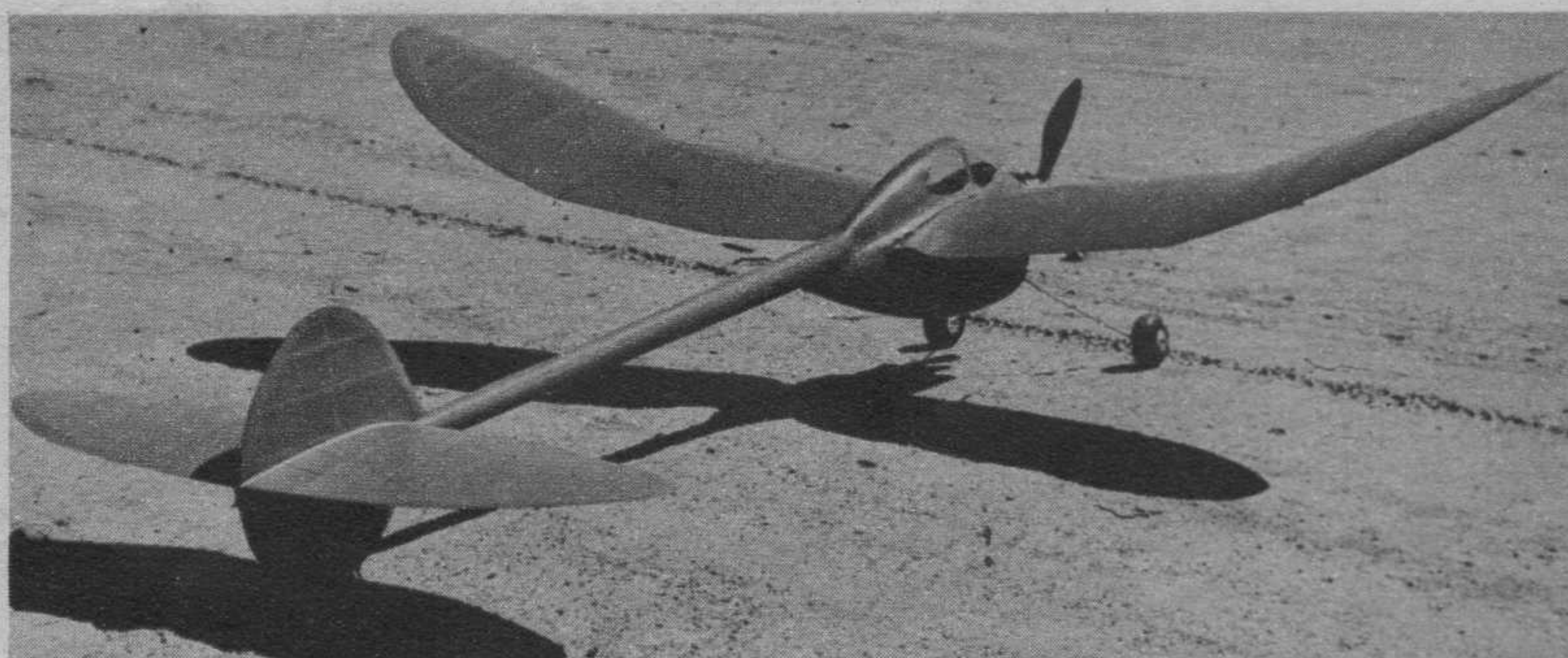
# NOMAD

Pod-and-boom aerodynamic efficiency make this realistic Class C gas model a top-notch performer.

BY CHARLES HOLLINGER



The Nomad is based on experience gained from two earlier pod-boom jobs.



Long-tail moment arm enables Nomad to handle Ohlsson 60s, Super Cyclones.



And here is the intrepid pilot himself, goggles, helmet to boot. Balsa block.

THE Nomad marks the third endeavor of the designer to create a top-notch flier using the pod-and-boom arrangement as a basis. Wind-tunnel tests show that it has the least drag of any fuselage design and there is practically no fuselage interference where the tail surfaces are concerned, regardless at what angle it may be flying. Why isn't it used more? The answer is that most modelers don't like the type of construction that is required, namely, planking and the bending of sheet for the boom. This slight extra work is well repaid by the performance that is gained.

In the month of May, 1939, the first of this series made its appearance. The model was designed with efficiency (high lift and low drag) as its keynote. An 8-foot wing span, 4-foot stabilizer, double rudders and short moment arm (to keep cross section to a minimum) resulted in a remarkable gliding angle of 12:1. I know that when this is called remarkable there will be some who will say, "Shucks, that's nothing, my rubber model has nearly a 20:1 glide." Wind-tunnel tests have proven this to be absolutely untrue. We of the Tacoma Gas Wings Club have found through tests and observations at contests that the best rubber-powered models have a glide ratio of about 6:1 and the best gas models of approximately 9:1.

Well, we had better get back to the model. True, it had a fine glide coupled with a slow sinking speed, but there was one bug and that was stability. Under low power it left nothing to be desired, but when the Brown D was opened wide it couldn't be counted on. This was due to the short moment arm, small rudders and lack of sufficient dihedral.

In the second design some efficiency was sacrificed to attain proper flight characteristics. Features of this model were an inverted M&M motor of .23-cubic-inch displacement, stabilizer on top of the rudder and a fifty-percent moment arm. This little 42-inch job proved to be a fine flier, at least good enough to win two first places, one in a thirty-mile wind with a time of 3 minutes, 54 seconds. Susceptibility to right spirals was its undoing later.

With the experience from these two as a guide, the Nomad was formulated in March, 1940. At that time a retractable gear had been planned for it, but this was passed over for the sake of simplicity. A single rudder was used because (Turn to page 56)

## FULL-SIZE PLANS

one sheet 38 inches x 52 inches

No more need to enlarge plans or to make your own working drawings. Now you can get full-size plans identical in detail to the scaled down drawing on the opposite page. This is the first of a series. Be sure to tell your friends and fellow club members. Only a limited number of these full-size plans will be printed, so order immediately. Send twenty-five cents per plan to

AIR TRAILS FULL-SIZE PLANS  
79 Seventh Avenue, New York, N. Y.



# SPECIFICATIONS

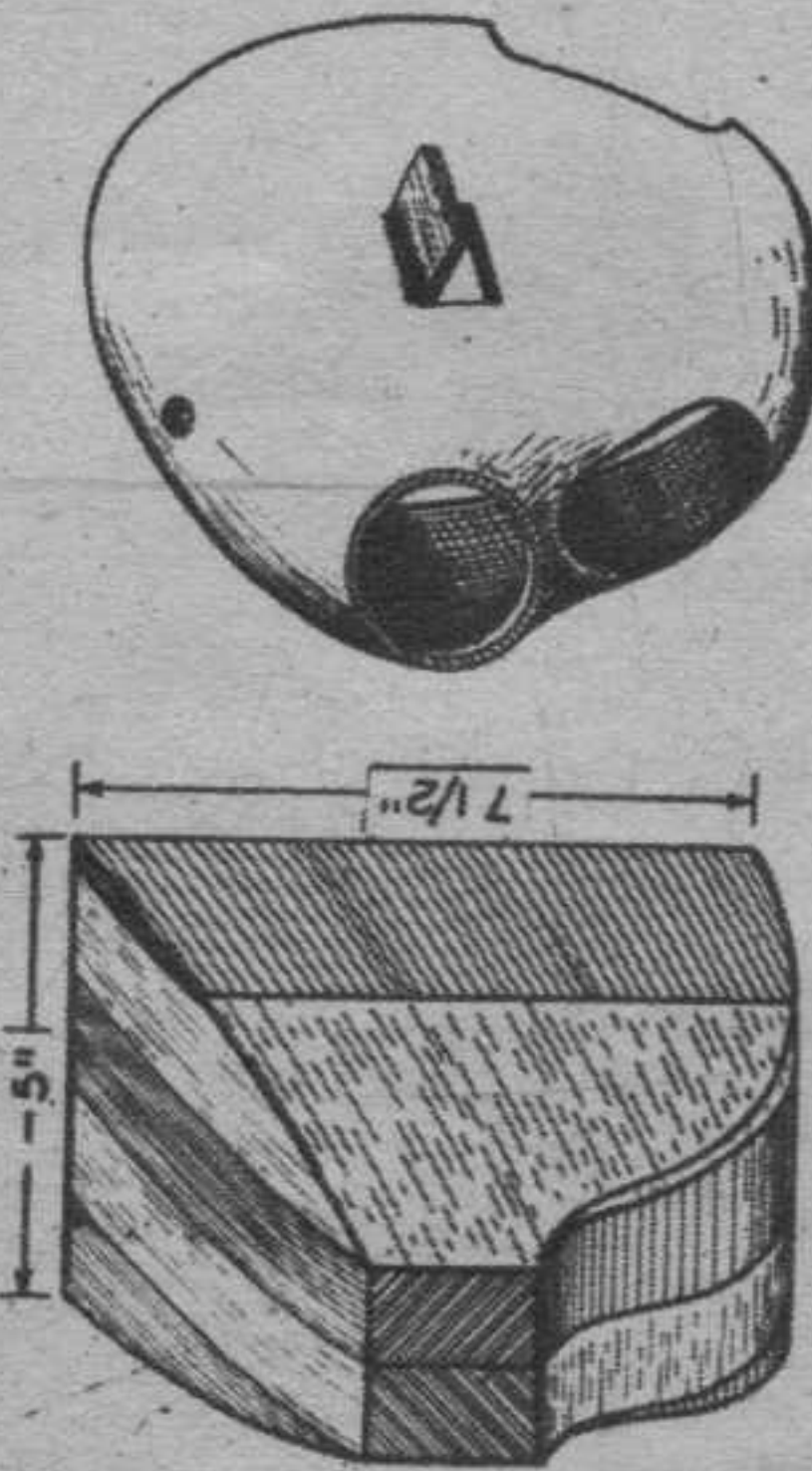
WING SPAN.....78"  
 WING AREA.....SQ. FT.-67  
 WING LOADING.....8.60  
 LENGTH.....60"  
 POWER USED.....OHLSSON "60"  
 PROPELLER.....14-15"

## WEIGHTS

WING.....12 OZ.  
 FUSELAGE.....38 OZ.  
 TAIL SURFACES.....3 OZ.  
 TOTAL.....3 LBS. 4 OZ.

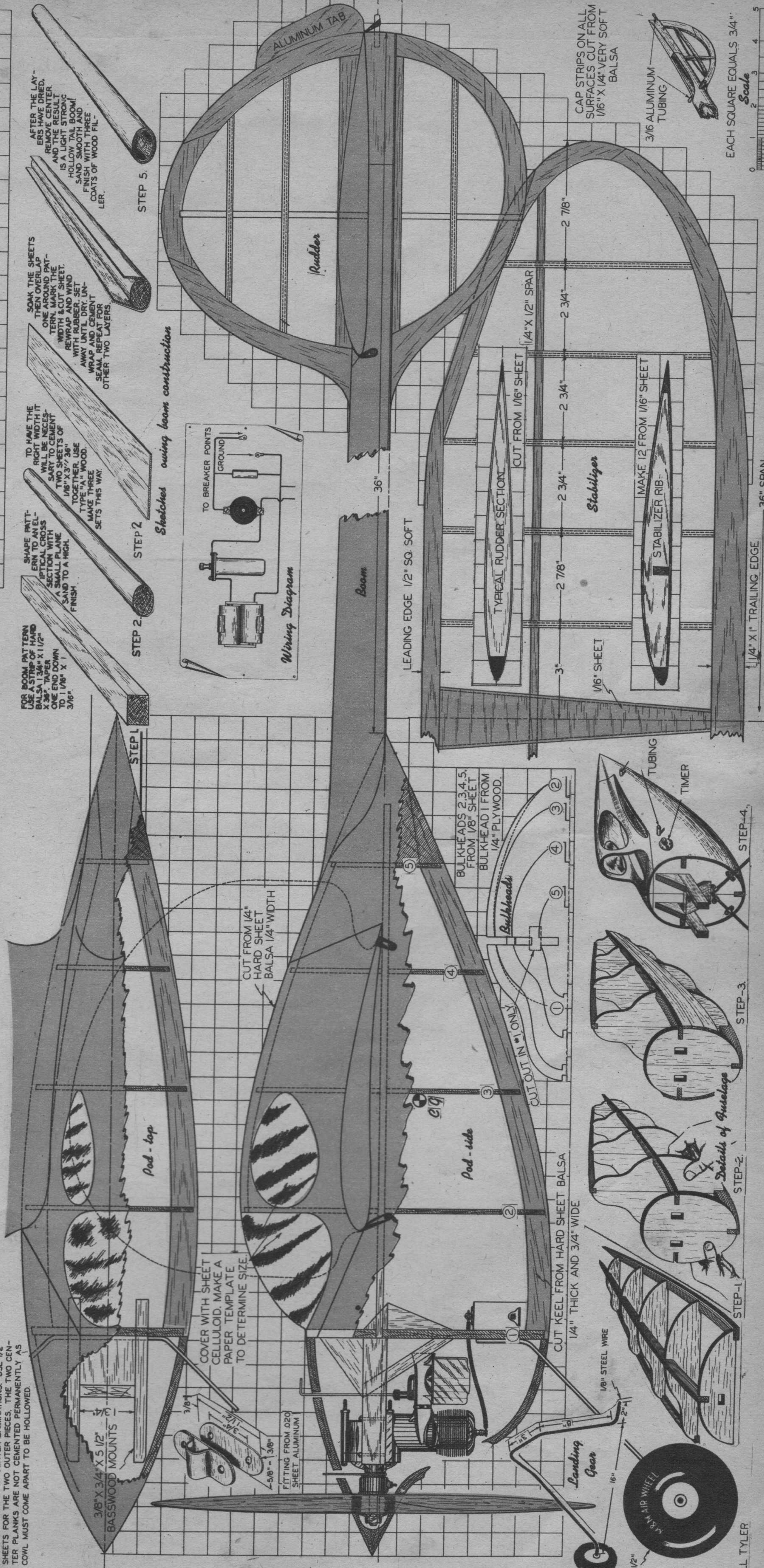
## ANGULAR SETTINGS (TAKEN FROM CENTER LINE OF FUSELAGE)

WING.....2° POS.  
 STABILIZER.....0°  
 MOTOR.....2° NEG.  
 3° LEFT THRUST



## Motor Cowling

BUILD UP COWLING FROM SOFT PLANKS OF Balsa 1" THICK FOR THE FOUR CENTER LAMINATIONS. USE 1/2" SHEETS FOR THE TWO OUTER LAMINATIONS. THE TWO CENTER PLANKS ARE NOT CEMENTED PERMANENTLY AS COWL MUST COME APART TO BE FOLLOWED.







Putting finishing touches on batch of Grumman midwings, part of an order of 1,500. Note DC-4.



Pouring molten white metal into small prop mold held in vise.

## MODEL CAREER MEN

Joe Battaglia makes a scale hobby into a career.

**J**OE BATTAGLIA has been building models for twenty-two years. Says Joe, "It started with one of Mom's best table knives and a crude attempt at carving a weather-vane propeller. That was before balsa wood. But we had gas models, believe it or not."

Even Joe himself has no idea of how many models he's built. Certainly it runs into the thousands. He recently turned out 1,500 metal Grumman midwings in three months. His largest job, a six-foot Pan American Clipper, required six months. Somehow, he found time enough to have a fling at making boats, trains, liquid-powered rockets, toys and what-have-you. But Joe's outstanding success has been his precision custom-made model airplanes.

How he makes metal models is shown on these two pages.



Sawing wood wing blanks for Stinson. After assembly carved blanks become pattern for plaster casts from which bronze molds are made.

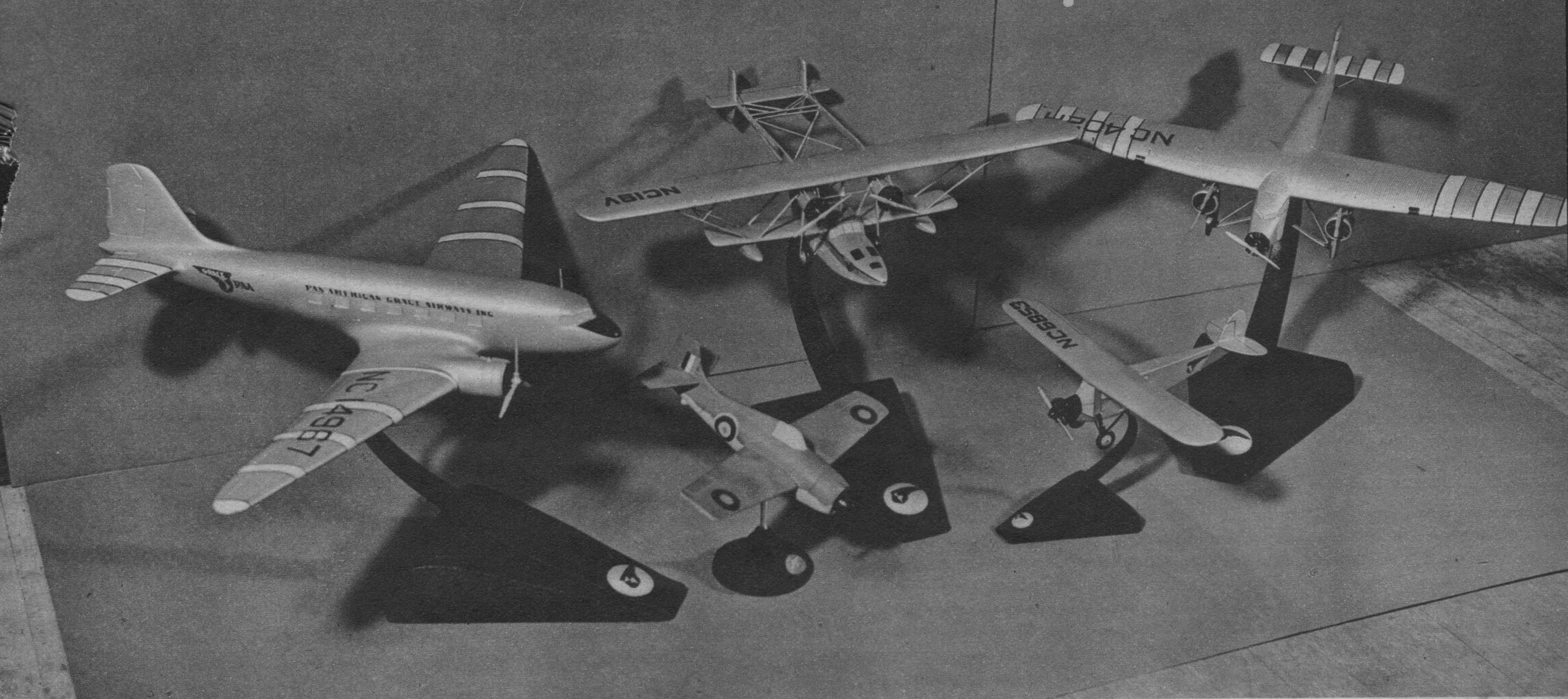


This Pan American Clipper was a six months' job. The plane itself is wood carved, but the pedestal is cast. Some Battaglia models are on display in museums.



Plaster is poured around model to make casts. Casts are then duplicated in bronze for molds. White metal is cast in the bronze molds.





Recent Battaglia models. British Grumman is cast, others built from wood on special order for airline official. Ford, right, has covering corrugations. Fairchild 71, front right.



Joe holds wooden pattern of DC-4. Left and right plaster cabin core molds against wall. Sand packed between them and baked to form core for making of the final bronze mold.

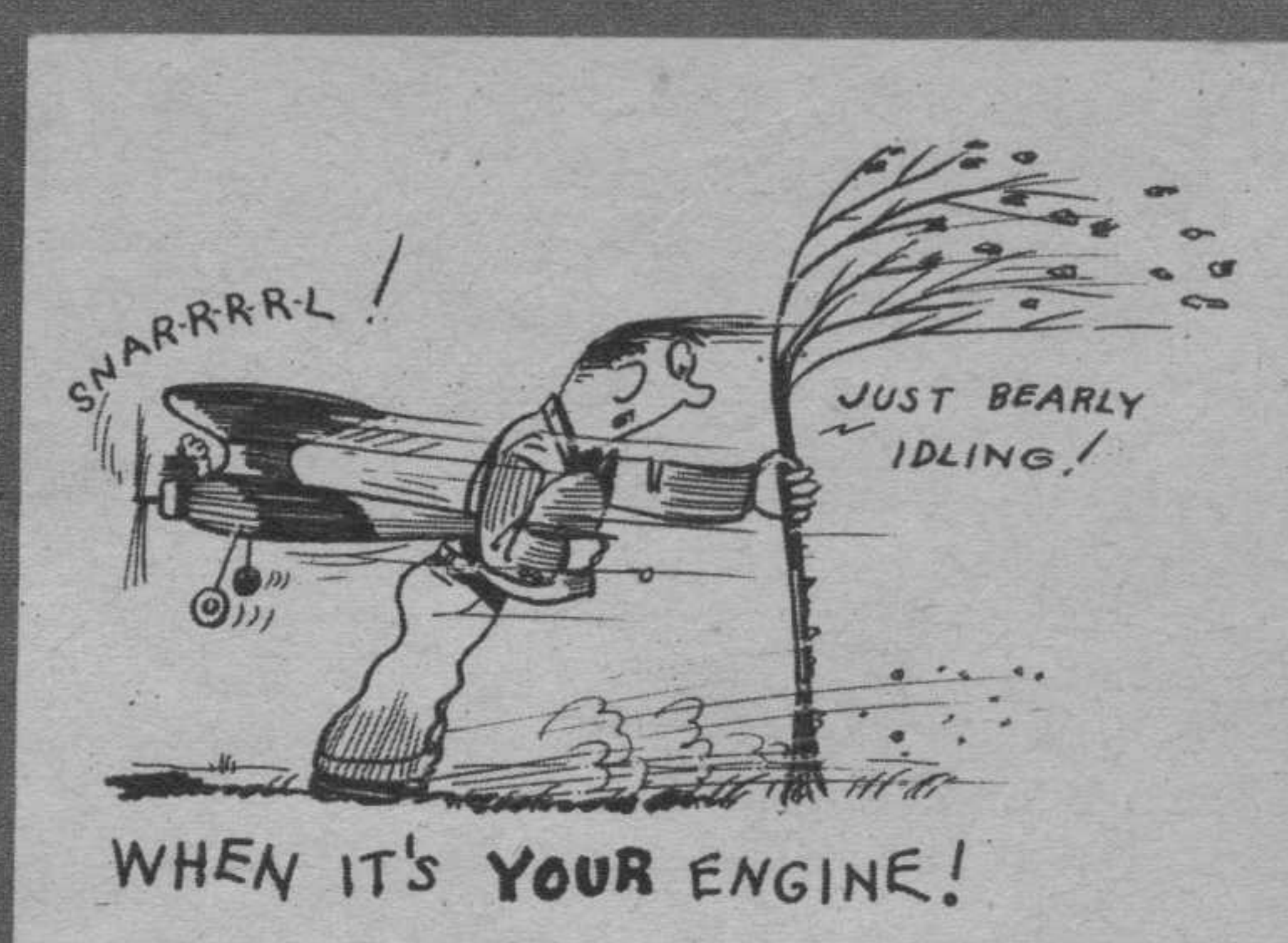
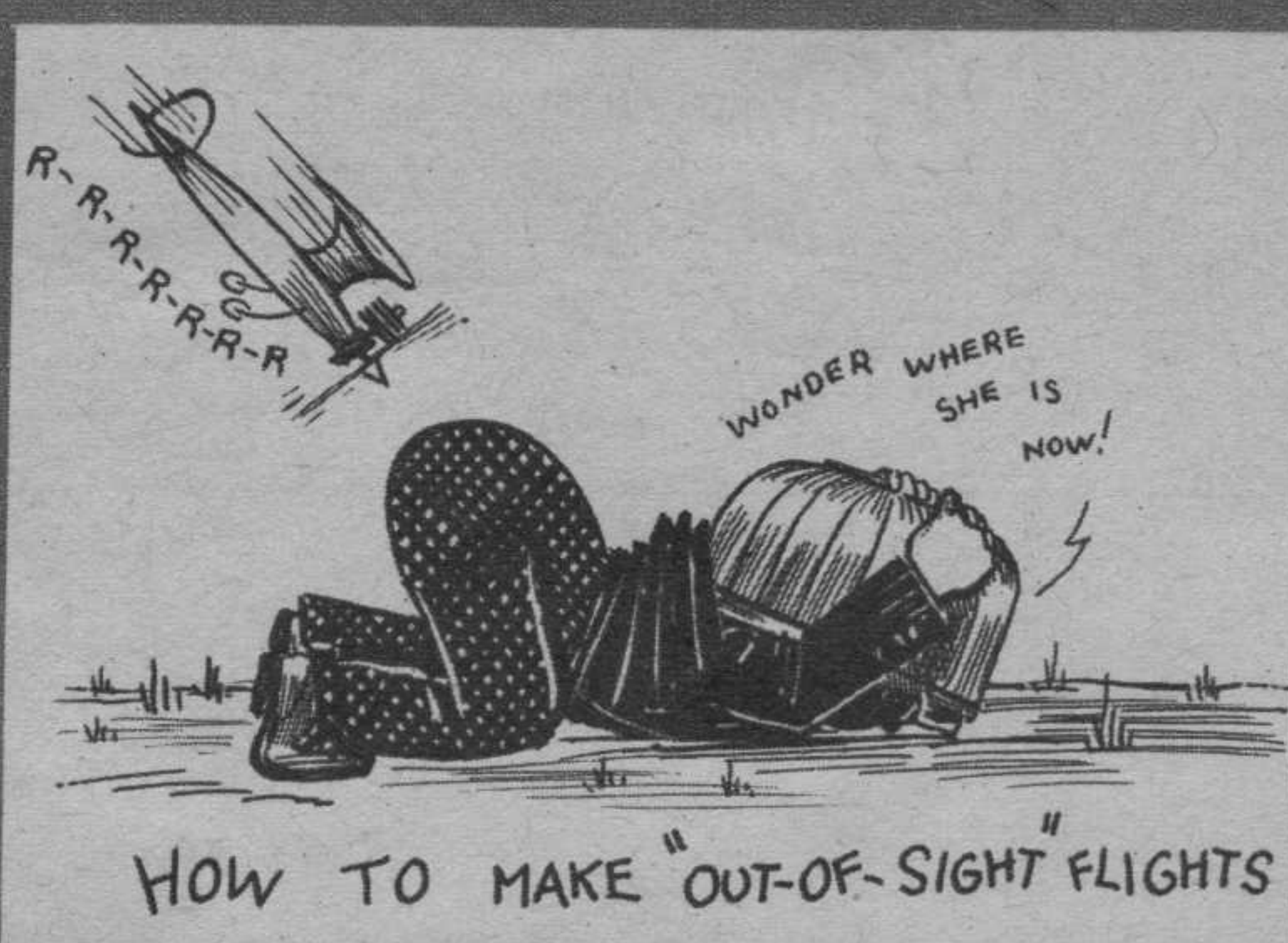
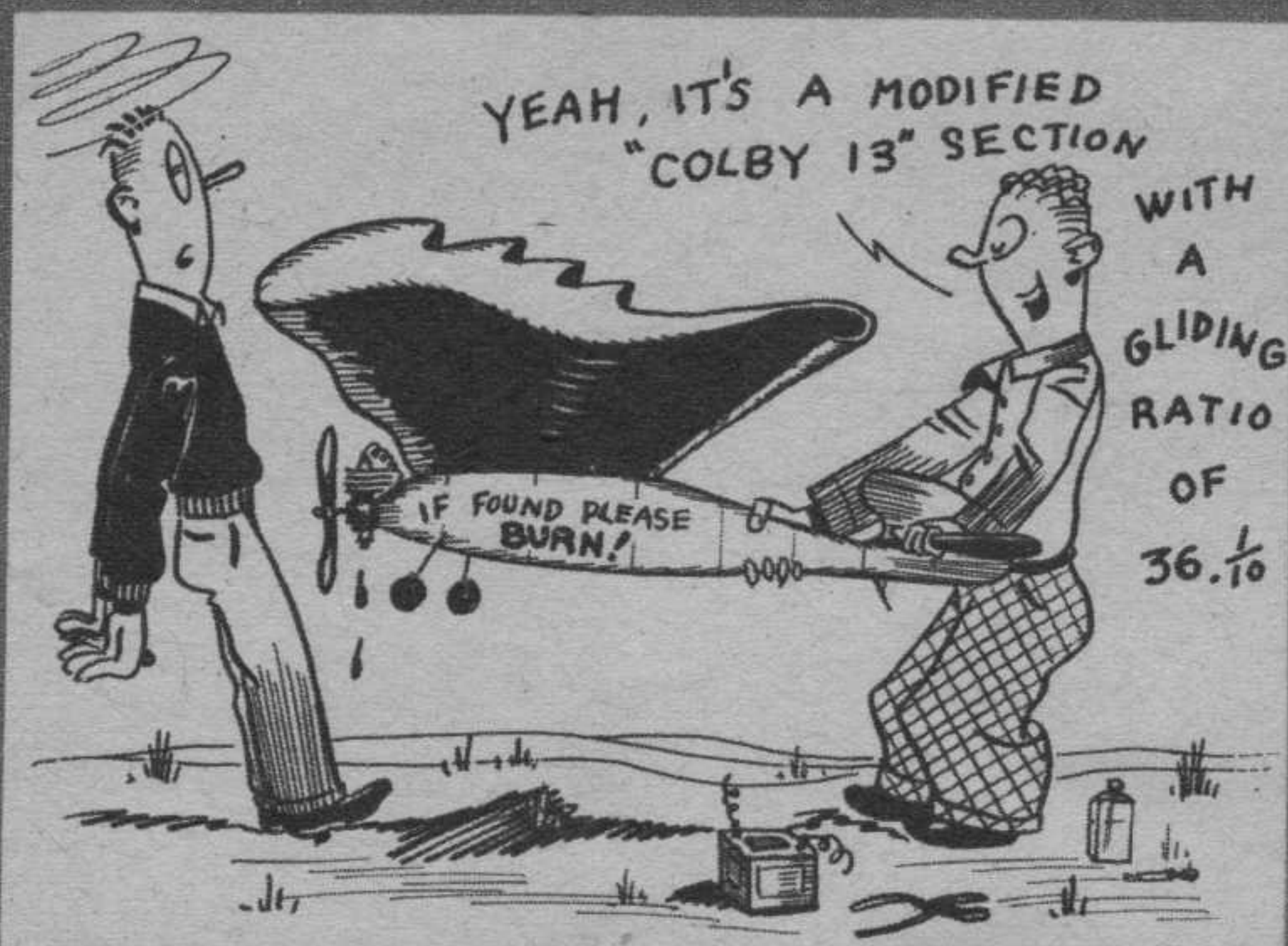


Paint trimming is done with an airbrush. The unpainted sections are protected by metal mask. These models are seen on display all over the country in air transportation offices.



Finished transport models sell for about \$35. The molds cost as much as \$900 apiece. Thus an order for 1,500 Grummans worked out for \$5 apiece.





# SLIDE, RULE, SLIDE!

BY GEORGE HUGGINS

**T**HE beginner who is now building, or who has just completed his first gas model, is considerably handicapped by his lack of some of the finer technical aspects of this interesting sport. The following formulas will enable the veriest tyro to compete with builders of greater experience.

## MOTOR SPEED

When discussing your pet motor, you must always assume a motor speed of 10,000 r. p. m. When discussing relative merits of other motors, you are to assume speeds of not over 4,000-5,000 r. p. m. However, when relating some particularly sensational flight of your own, you must never concede that your motor has developed high speed, but it must invariably be described as having run at "part throttle," "four-cycling," or "just barely turning over."

## RATE OF CLIMB

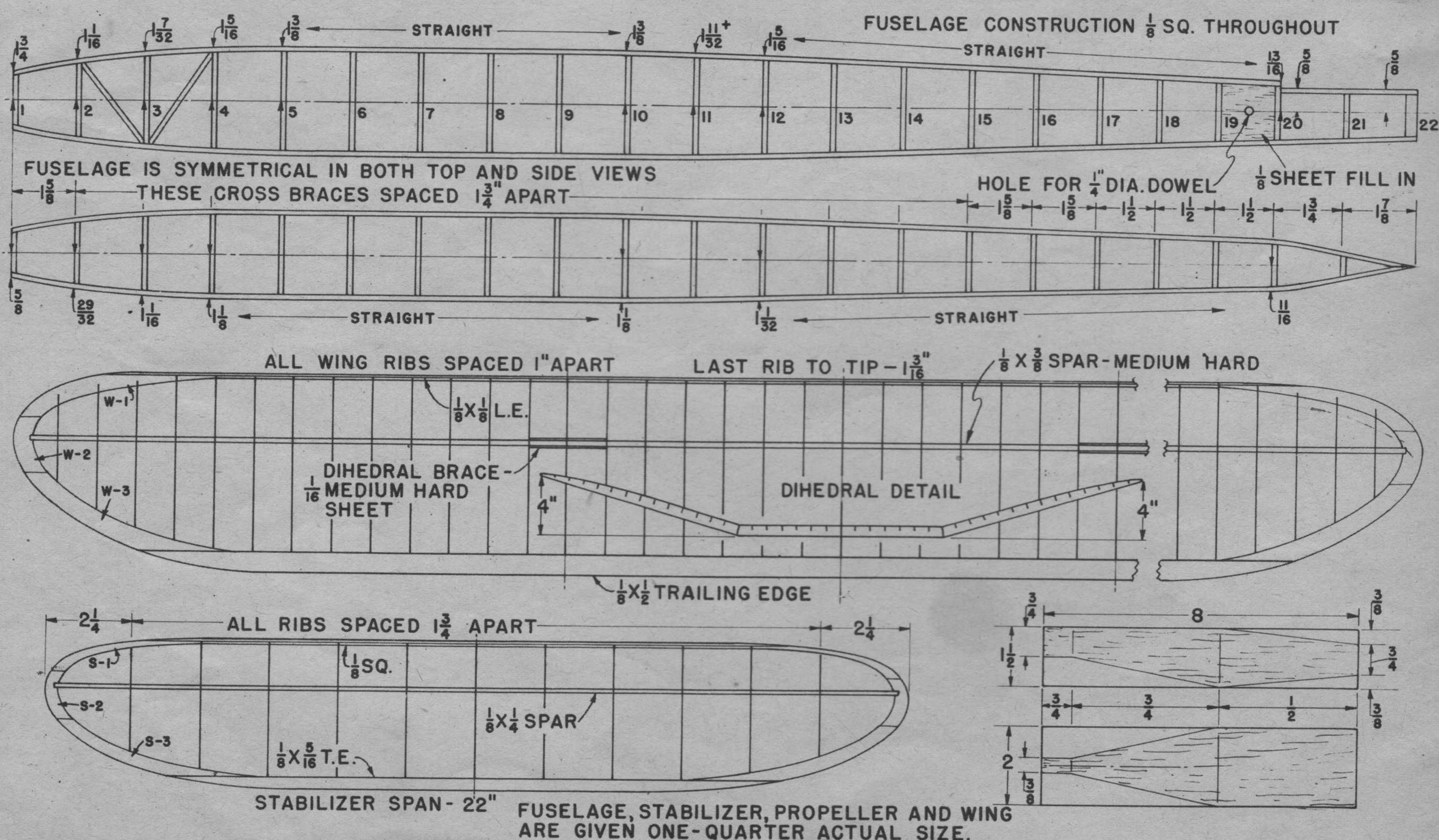
All gas models previously climbed at the rate of 1,000 feet per minute. This got rather monotonous, so it must be assumed now that all gas models climb at the rate of 2,000 f. p. m. When your motor cuts off, your altitude can be ascertained readily. If you are still able to read the manufacturer's trademark on your airwheels, your ship is 500 feet high. If estimating the height of a friend's or competitor's ship, similar altitudes can be taken as fifty feet or "barely off the ground."

## GLIDING RATIO

A ratio of 10:1 is very favorable indeed, but due to the fact that you have "modified" the airfoil section, you should easily be able to claim a glide ratio between 18:1 and 22:1. Fo (Turn to page 57)



## MULVIHILL TROPHY WINNER





**T**HIS model was completed the week before the Nationals and was first test-flown in Chicago. During the tests I was able to average between  $3\frac{1}{2}$  to 4 minutes quite consistently. On its first official flight on the day of the contest it flew out of sight after almost twelve minutes (11:54:7) and another ship was used to complete the day's flying.

## CONSTRUCTION

The fuselage is built in the conventional manner, by first making two identical sides, one above the other to insure similarity of shape. The longerons should be  $\frac{1}{8}$ " square hard balsa and the cross braces  $\frac{1}{8}$ " square medium soft balsa. The two halves are then joined by cementing the cross braces in place, starting at

the widest portion and working toward each end, and thereby forming a rectangular fuselage. The front and rear ends are both filled in with  $\frac{1}{8}$ " hard sheet balsa as indicated on the plans.

The wing is built in three 14" panels, which are joined after all are complete. The dihedral breaks are reinforced with  $\frac{1}{16}$ " hard balsa. The ribs are made from  $\frac{1}{16}$ " sheet (soft) balsa. See plans for further details.

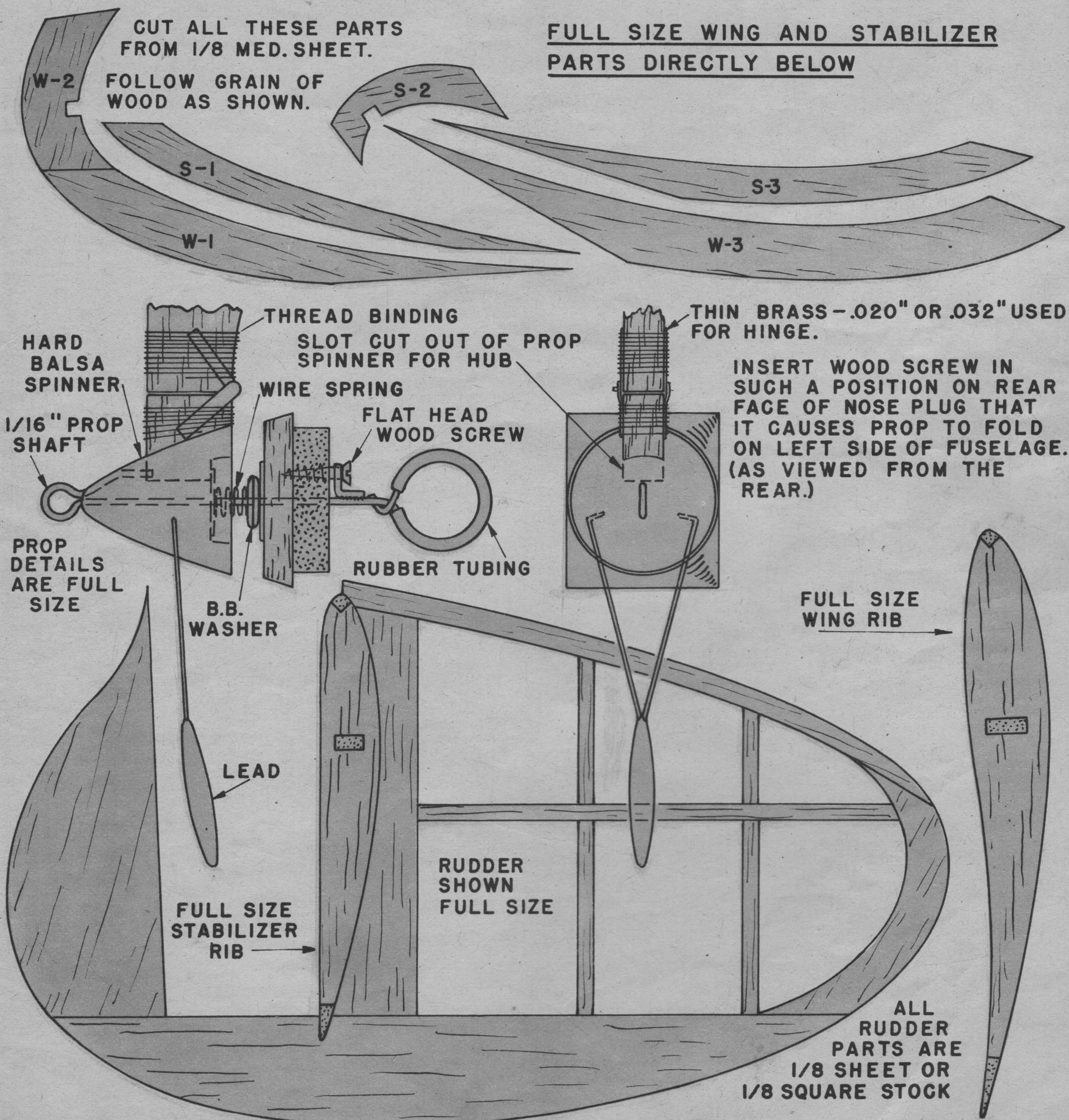
The stabilizer is built in much the same manner as the wing, using wood sizes and grades as specified in the plans. The rudder has a flat cross section of  $\frac{1}{8}$ ".

The propeller is carved in the usual manner from a medium block of balsa, measuring  $8 \times 1\frac{1}{2} \times 2$ ". Cut the blade to about a  $\frac{1}{8}$ " cup at the halfway point, diminishing to a (Turn to page 65)

**CUT ALL THESE PARTS FROM  $\frac{1}{8}$  MED. SHEET.**

**FOLLOW GRAIN OF WOOD AS SHOWN.**

**FULL SIZE WING AND STABILIZER PARTS DIRECTLY BELOW**



HARD  
BALSA  
SPINNER

$\frac{1}{16}$ " PROP  
SHAFT

PROP  
DETAILS  
ARE FULL  
SIZE

B.B.  
WASHER

LEAD

FULL SIZE  
STABILIZER  
RIB

THREAD BINDING  
SLOT CUT OUT OF PROP  
SPINNER FOR HUB

WIRE SPRING

FLAT HEAD  
WOOD SCREW

RUBBER TUBING

THIN BRASS—.020" OR .032" USED  
FOR HINGE.

INSERT WOOD SCREW IN  
SUCH A POSITION ON REAR  
FACE OF NOSE PLUG THAT  
IT CAUSES PROP TO FOLD  
ON LEFT SIDE OF FUSELAGE.  
(AS VIEWED FROM THE  
REAR.)

FULL SIZE  
WING RIB

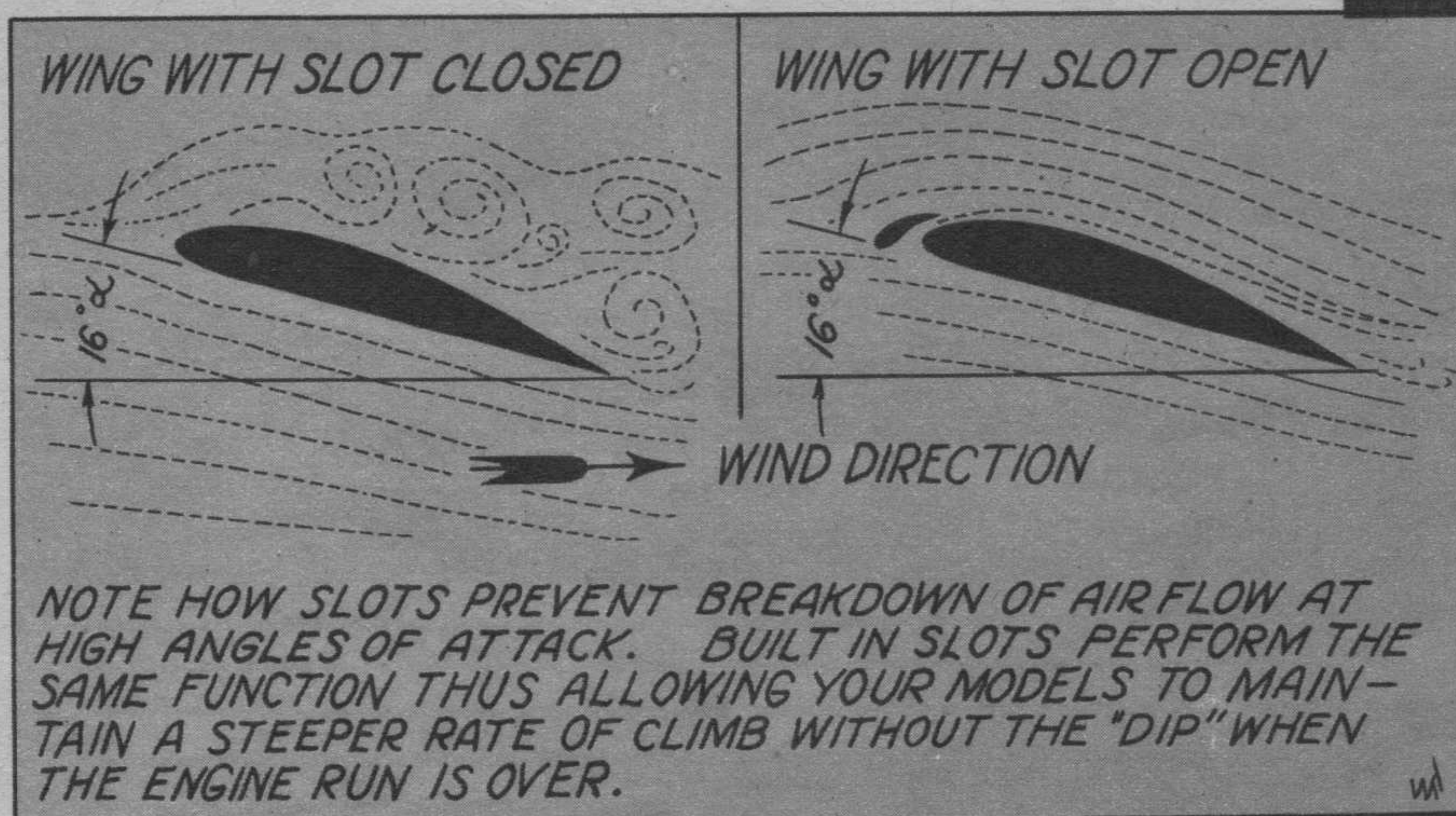
RUDDER  
SHOWN  
FULL SIZE

ALL  
RUDDER  
PARTS ARE  
 $\frac{1}{8}$  SHEET OR  
 $\frac{1}{8}$  SQUARE STOCK



# WHY SLOTS?

Massachusetts Institute of Technology tests prove value of "letter-box" wing tip slots.



BY JACQUES SHAW  
and BILL TYLER

THE use of slots in aircraft wings, in recent years, has become increasingly popular. To determine whether the benefits derived from slots by full-scale aircraft are applicable to model aircraft, a series of tests were run off in the four-foot wind tunnel at the Massachusetts Institute of Technology.

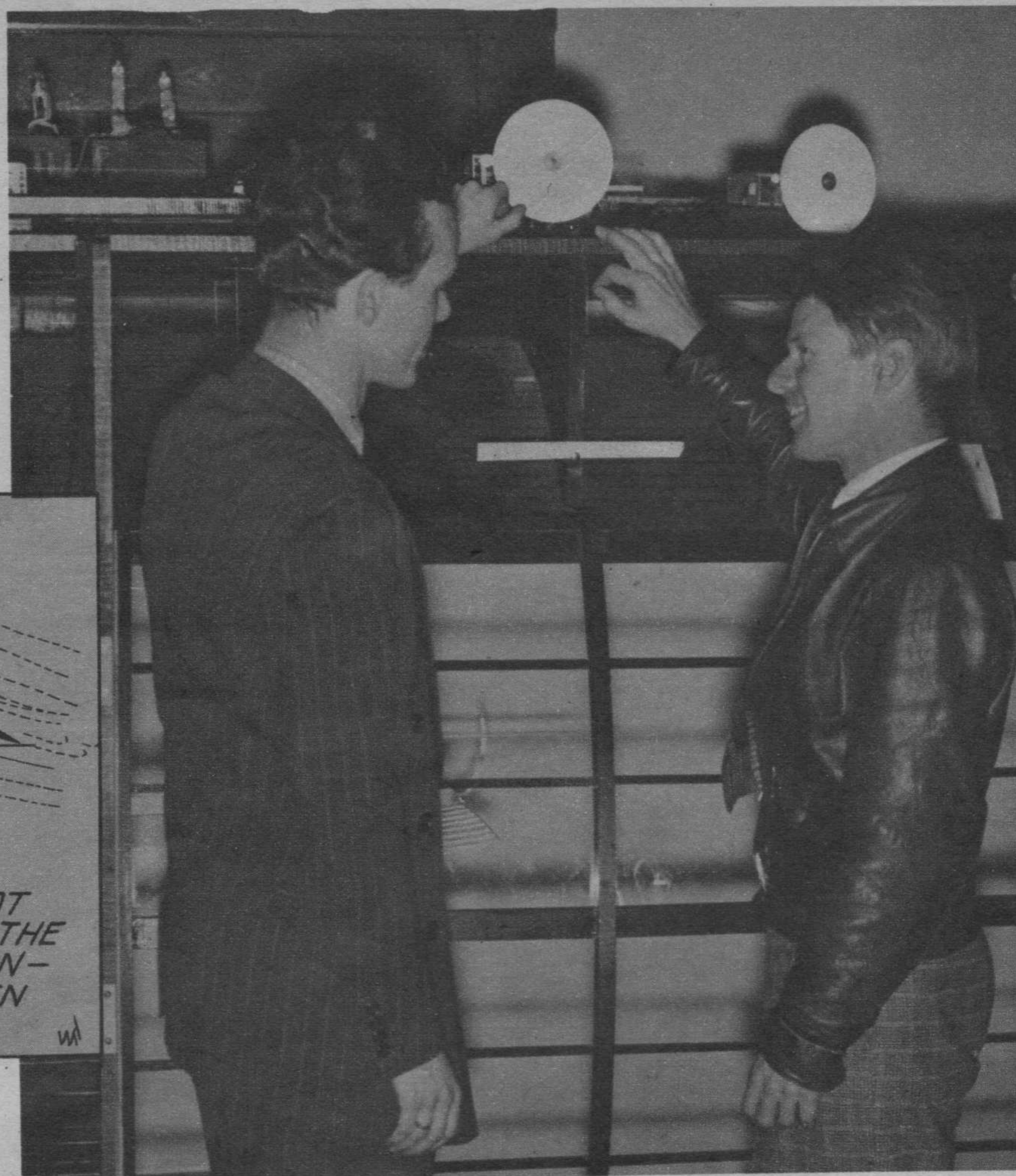
The basic qualitative theory of the slotted wing is relatively simple. We may consider the portion of the wing ahead of the slot as a wing itself. This "wing" acts on the air passing over it just as any wing will, and there is a resultant downwash off the trailing edge. This effect, combined with the speeding up of the air stream in the slot itself because of its venturi tubelike construction, allows the stagnation point of the boundary layer to occur much closer to the trailing edge. The location of the stagnation point determines where the streamline flow is going to break away from the wing, or where "burble" will start, for this burble point creeps up toward the leading edge, determining how completely the wing is stalled.

To insure uniformity, the same test section for both the slot and nonslot observations was used, this being made possible by the simple expedient of doping a small piece of tissue over the slot openings.

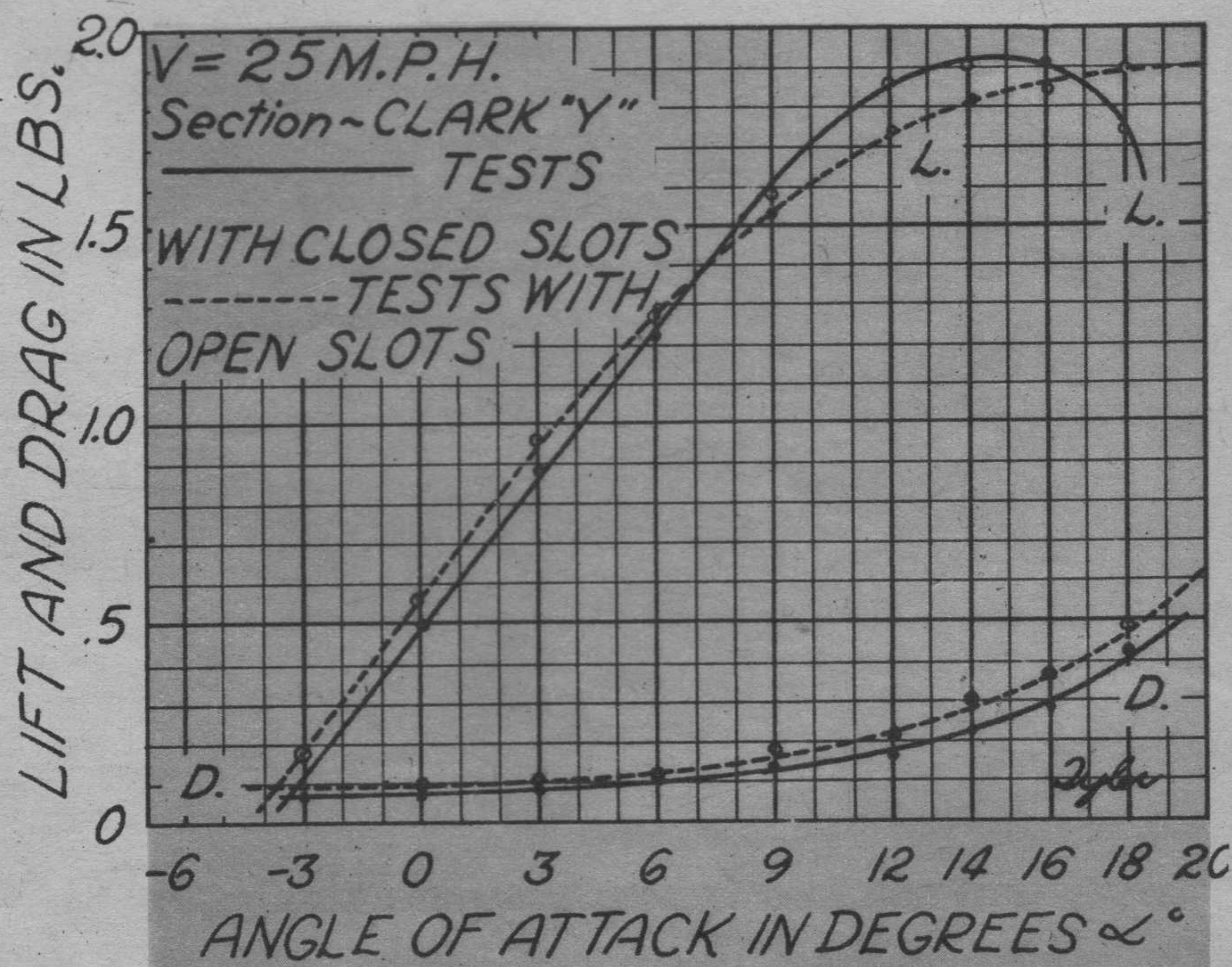
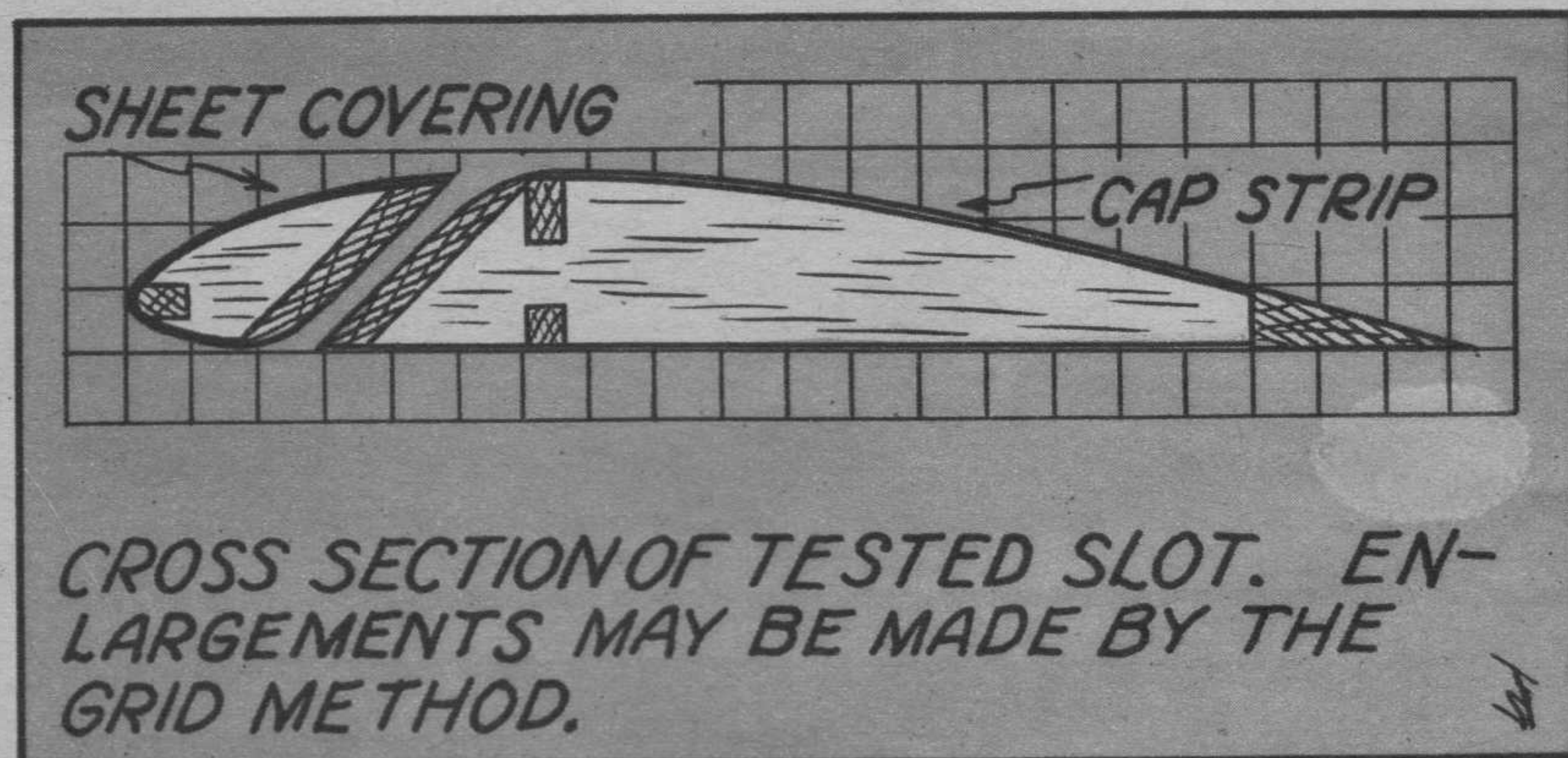
The test section itself was of standard proportions for the particular tunnel used. It had a 30-inch span, aspect ratio of 6-1, constant chord, Clark Y airfoil, and square tips. With the exception of square tips, the section is typical of many wings in use, and it was learned that the tip shape had negligible effect on our results in this case.

The structure and finish of the section were made to conform as closely as possible to an average gas-model wing. Specifically, the ribs were spaced 2 inches apart and capped, and the leading edge was sheeted. The slots were 9 inches long, and placed on the tips.

It can be seen from the plots of lift and drag that substantial advantages may be obtained by the use of slots, accompanied by some slight disadvantages. Note the lift curve of the nonslot wing. It rises in conventional manner along a virtually straight line and then rounds off rather (Turn to page 65)



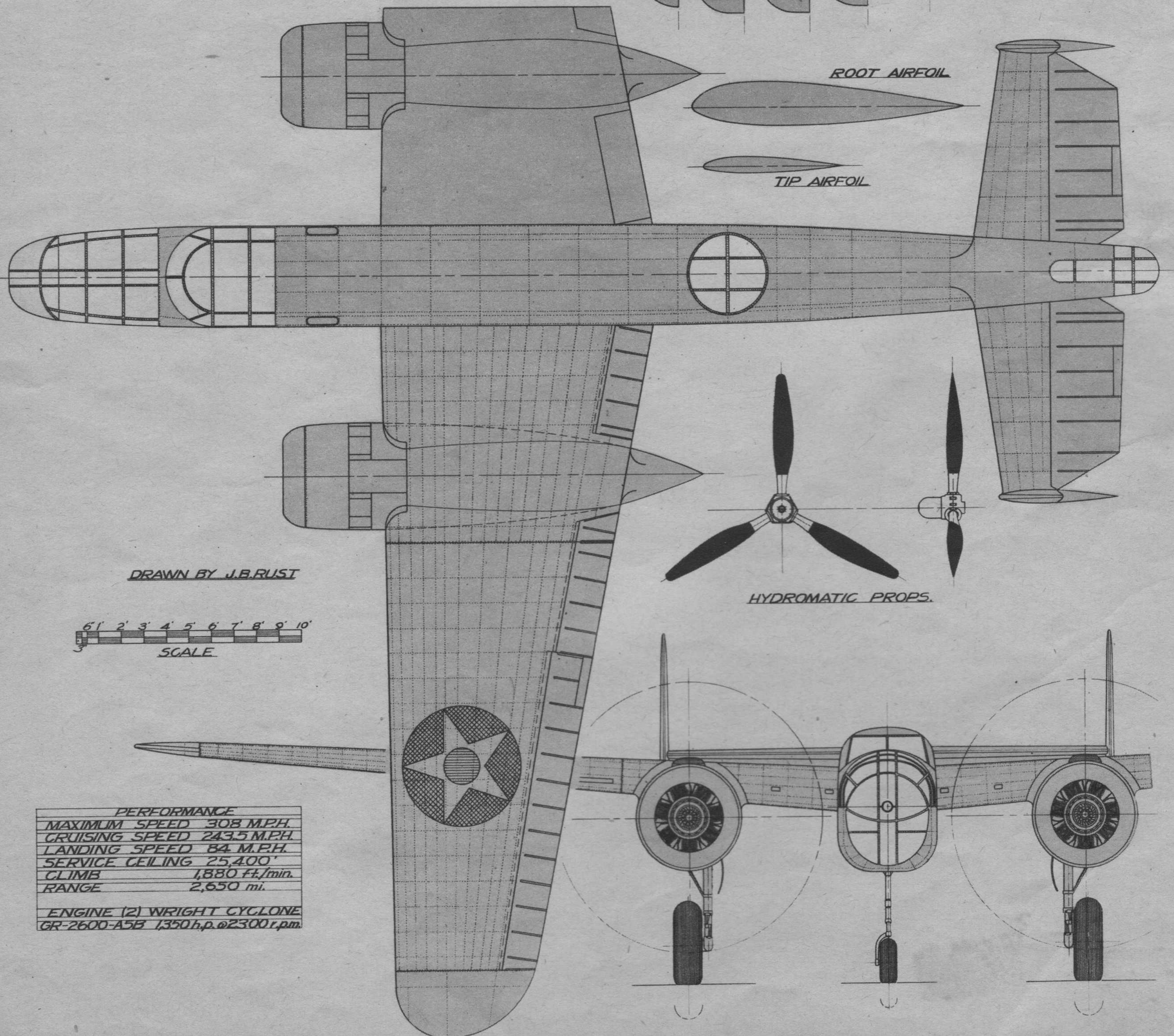
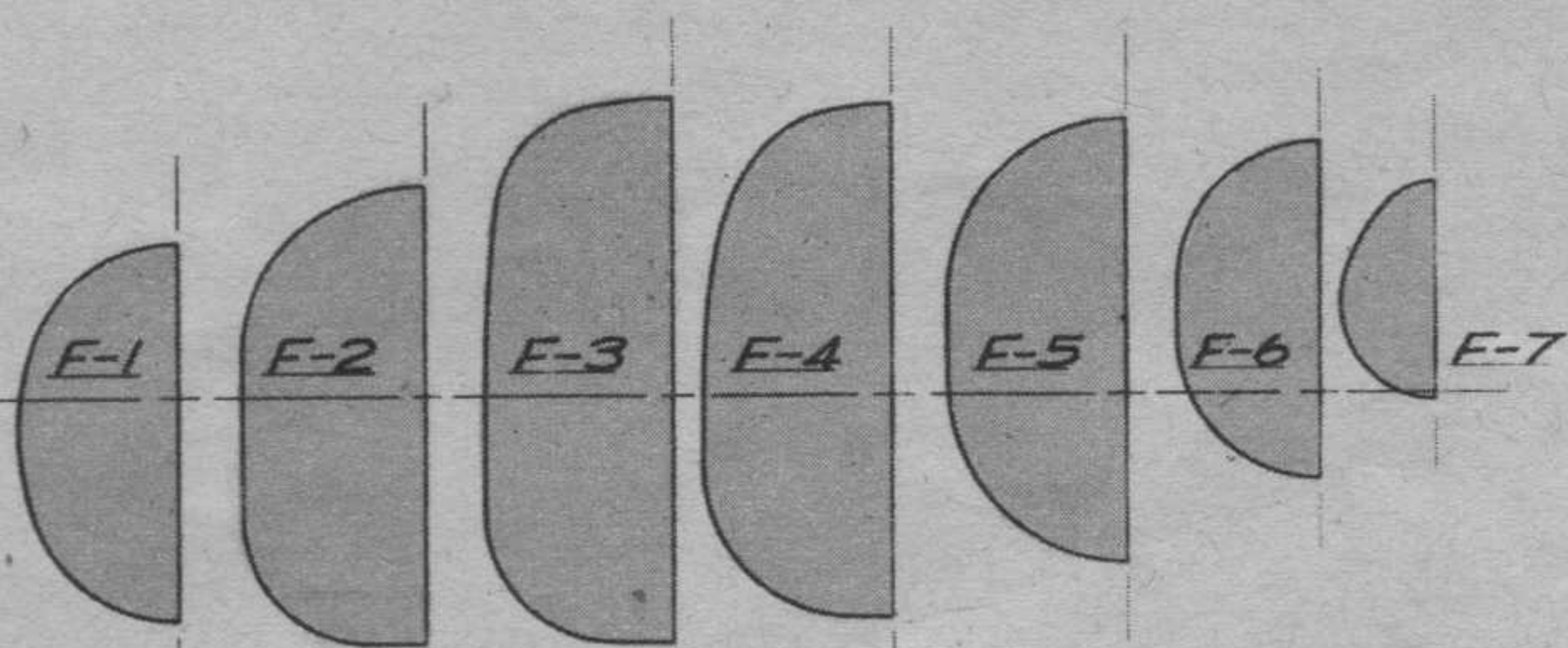
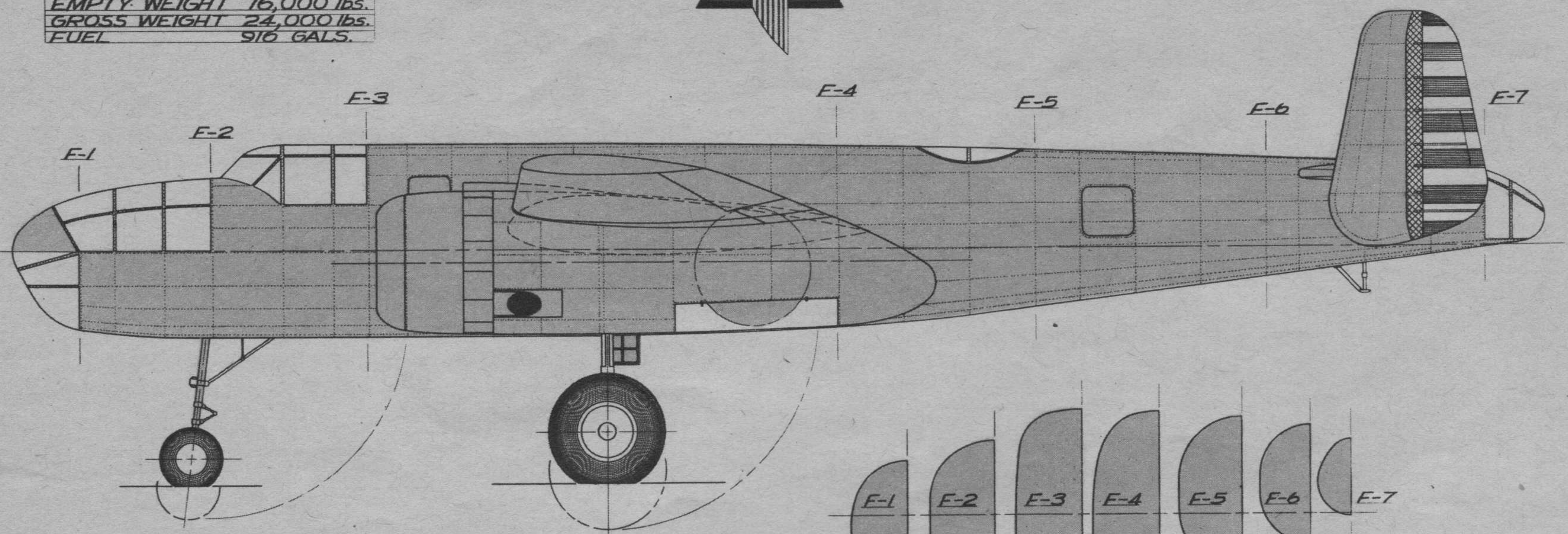
Bill Tyler, left, shows Doug Corrigan details of the Jordan-Marsh slow-speed model wind tunnel in Boston. Model aerodynamics are a specialized problem.





# NORTH AMERICAN B-25 Army Medium Bomber

SPECIFICATIONS:	
SPAN	67' 6"
LENGTH	51' 5"
HEIGHT	14' 10.5"
WING AREA	610.1 ft <sup>2</sup>
WING LOADING	39.33 lbs./ft <sup>2</sup>
POWER LOADING	7.5 lbs./h.p.
EMPTY WEIGHT	16,000 lbs.
GROSS WEIGHT	24,000 lbs.
FUEL	916 GALS.

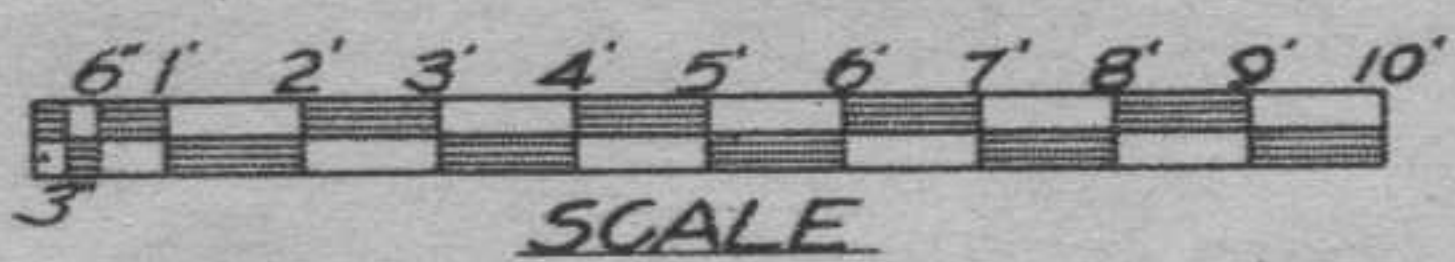


ROOT AIRFOIL

TIP AIRFOIL

HYDROMATIC PROPS.

DRAWN BY J.B. RUST



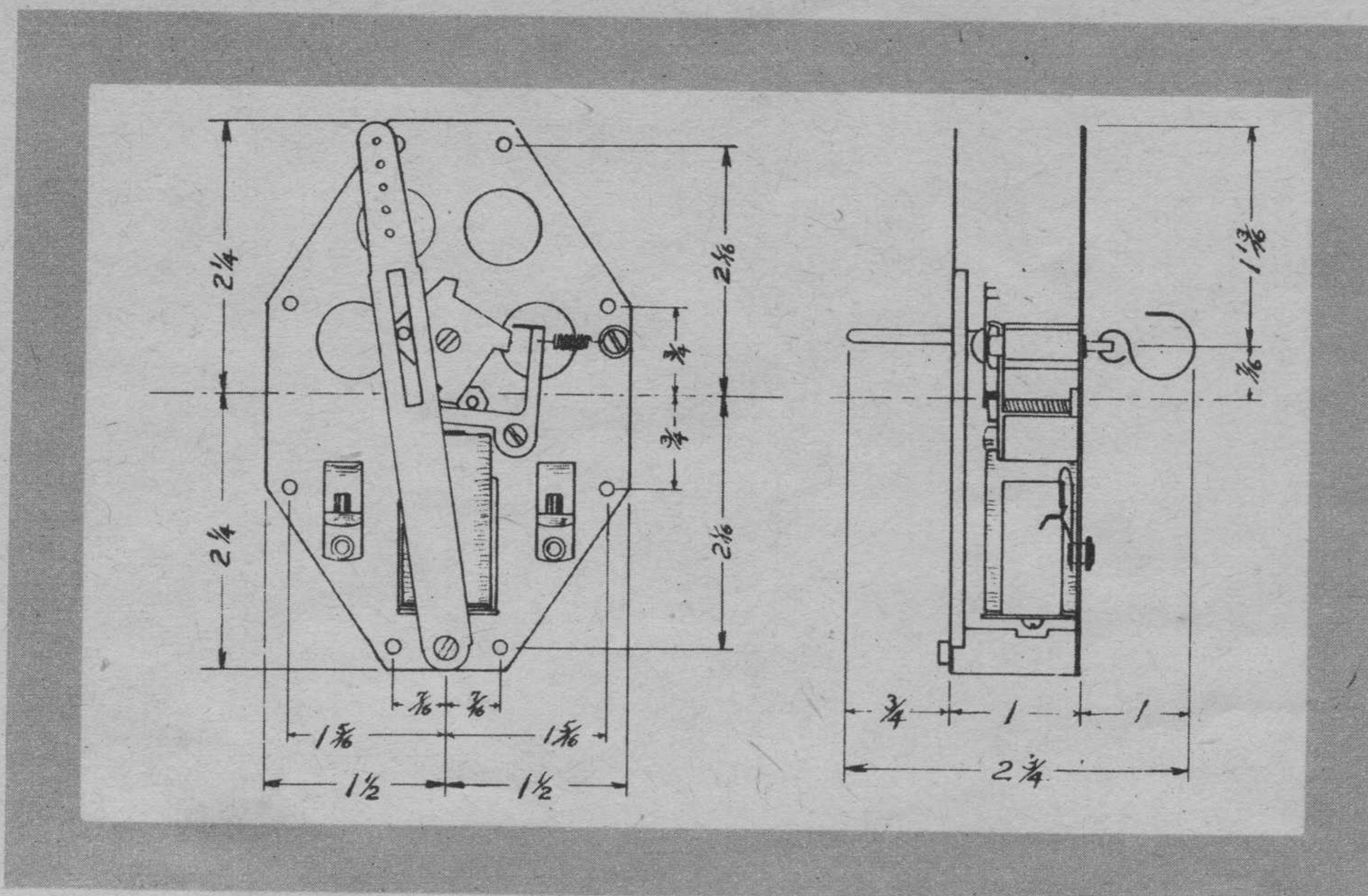
SCALE

PERFORMANCE	
MAXIMUM SPEED	308 M.P.H.
CRUISING SPEED	243.5 M.P.H.
LANDING SPEED	84 M.P.H.
SERVICE CEILING	25,400'
CLIMB	1,880 ft./min.
RANGE	2,650 mi.
ENGINE (2) WRIGHT CYCLONE	
GR-2600-A5B 1,350 h.p. @ 2,300 r.p.m.	



# NEW RADIO CONTROL ESCAPEMENT

Left or right rudder does not depend on proper series of pulses; automatical return to neutral.



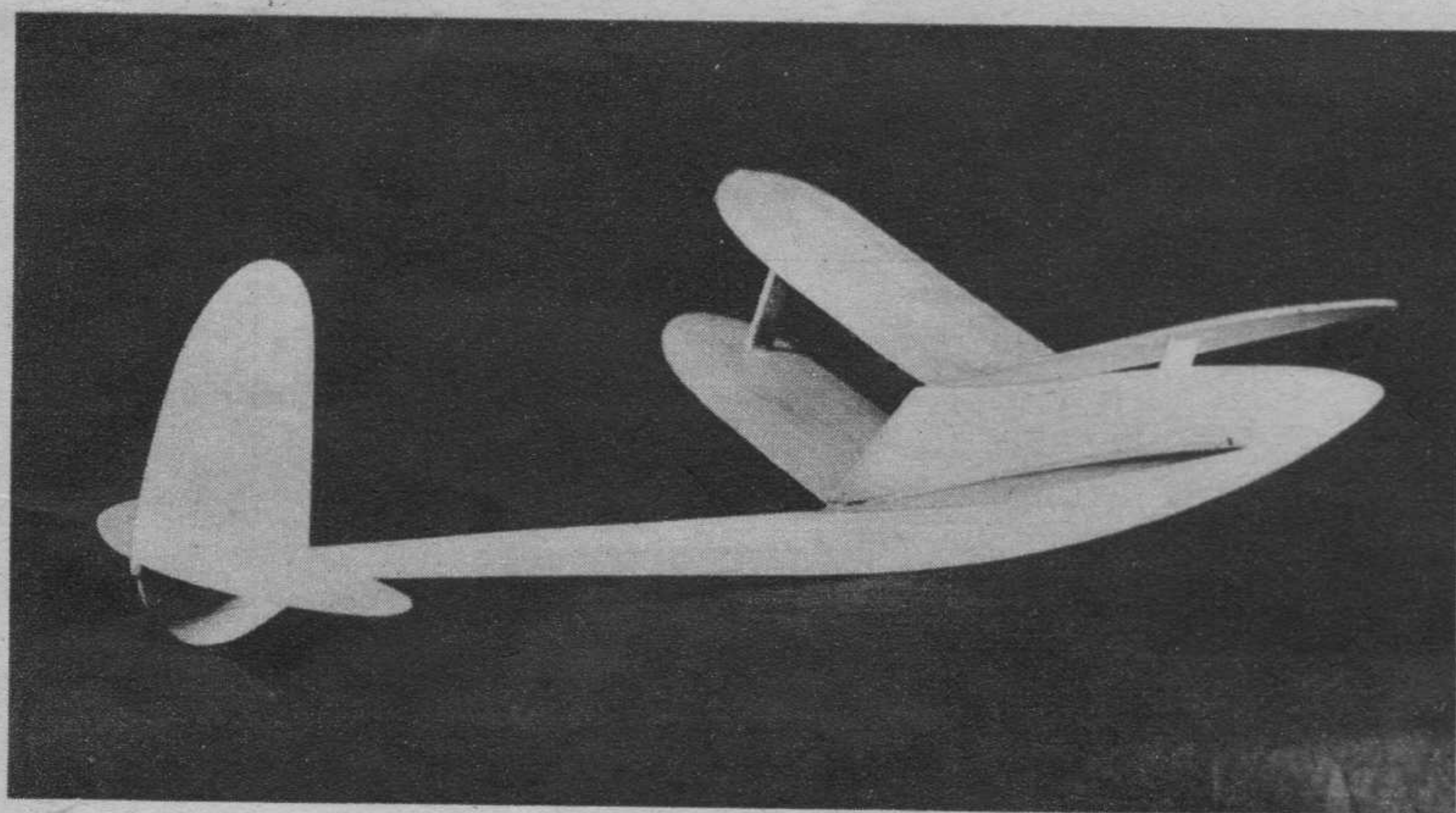
One reason why the motor drive is more reliable than the rubber-powered escapement is that it can be fitted with a centralizing switch. As used in the RCH (Radio Control Headquarters) No. 1345 control-drive assembly, this switch always returns the control to dead center, either at the option of the operator or automatically when the control is released. Furthermore, the determination of right or left rudder is a positive operation and does not depend on the proper series of pulses, as is the case with the escapement.

"Why isn't it possible to endow the escapement mechanism with these same qualities?" we asked ourselves. There followed long sessions over the drafting board, a succession of experimental models—and finally the idea came along that turned the trick, an idea so simple that we wonder now why we didn't think of it in the very beginning (as is usually the case with ideas of that sort). All it takes is a few

changes in the escapement disk of a standard RCH No. 121 escapement—and presto! we have a device that gives us right rudder when we push the button once and left rudder when we push it twice. What about neutral? Why, neutral is restored the moment we lift our finger from the button. When the signal is turned off the escapement goes back to neutral.

We best can describe the new escapement by first giving the principles of the standard RCH No. 121 escapement (Turn to page 58)

**R**ECENT trends in the radio-control field have been toward standardization of two basic control systems. One employs the rubber-powered escapement mechanism originally introduced by Ross A. Hull and the other utilizes the reversible miniature electric-motor drive with limiting switches first described by Clinton B. DeSoto. The advantage of the escapement system include lightness, simplicity and economy, while the motor drive excels in reliability as well as offering a variable degree of control.



## DOUBLE-DECKER

BY AUSTIN RINALDI

This nifty all-balsa biplane glider has plenty on the ball. Wait until you see it fly.

**H**ERE it is, something different—a Class B hand-launch biplane glider that's a peach in looks and in flight. Despite the theory that monoplane gliders are superior, this ship was designed, and after some changes here and there, has proven itself in many contests a match for the ordinary monoplane glider. It is of simple construction and can be easily built by anyone who has made other gliders. It is just the job for you model builders who are getting tired of that same glider everyone brings to the contests. This ship can also be used as a catapult glider by cutting a catapult groove in the lower section of the body. Not once while being catapulted has it looped, but climbs until the power is exhausted and soars around, turning in good flights.

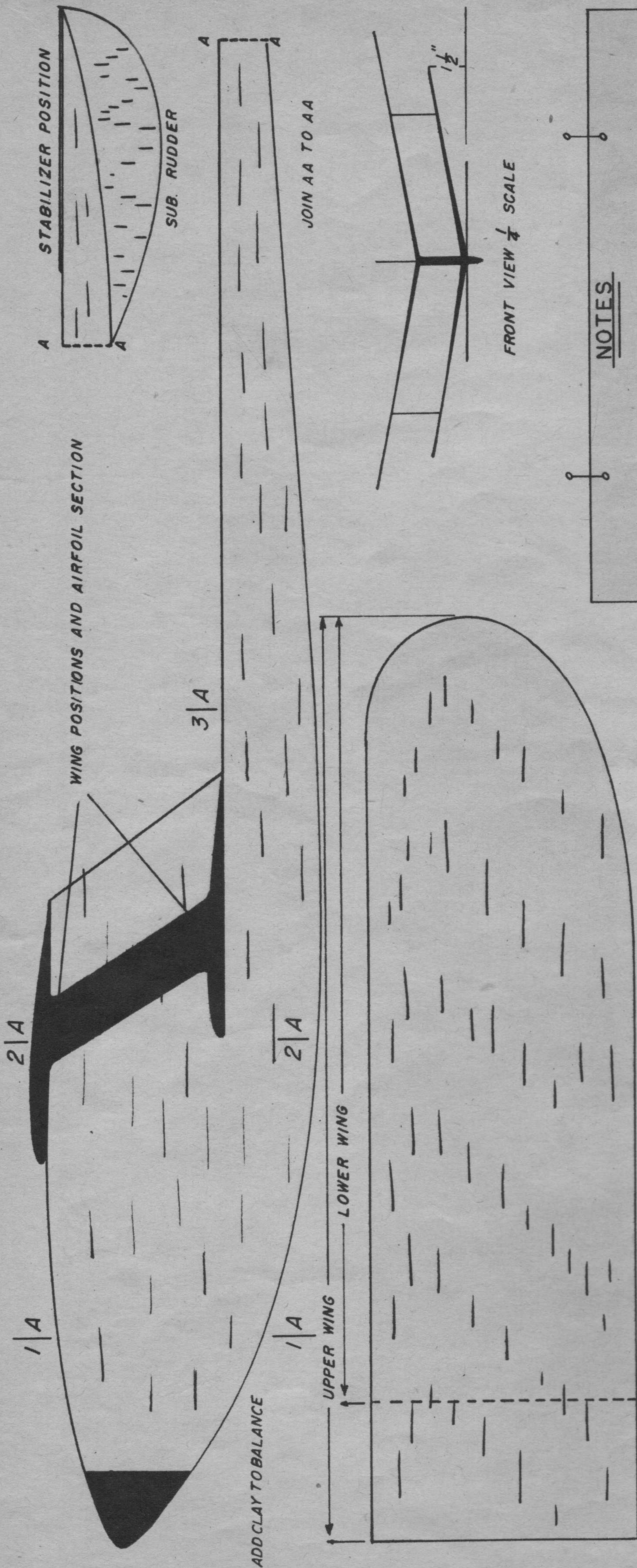
But without going any further, the picture and plan impress you enough. Check the bill of materials printed on the plan and see how little it will cost to build this biplane glider.

### CONSTRUCTION

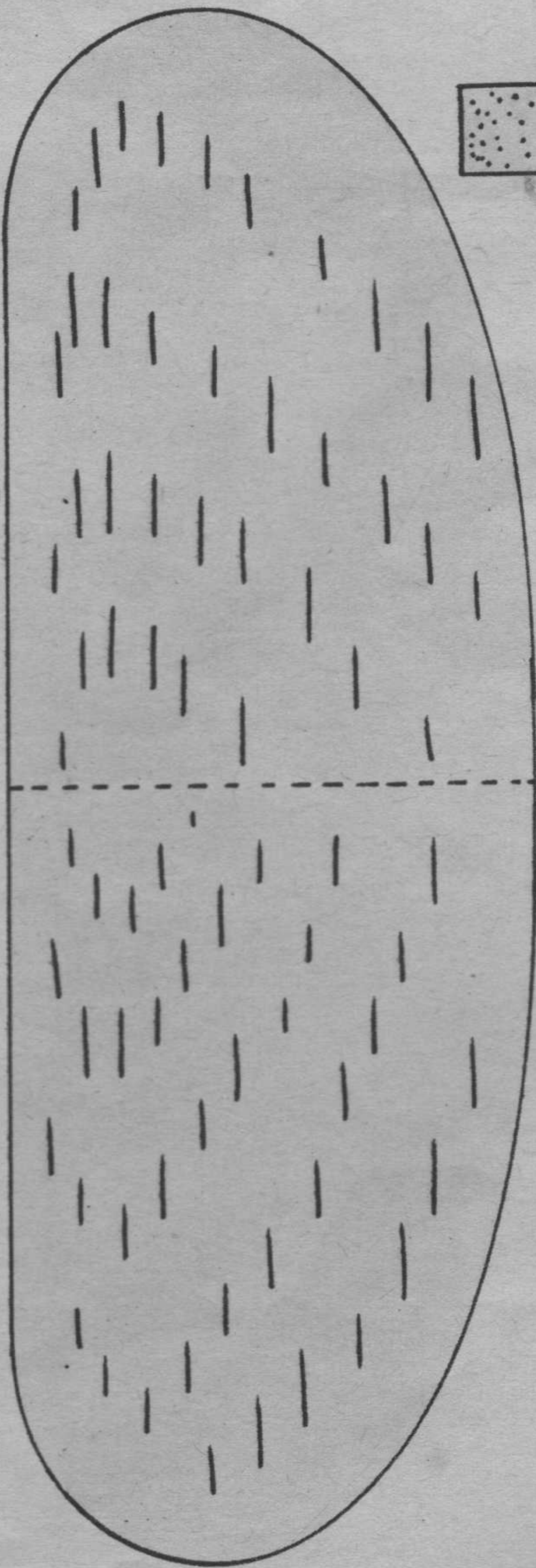
The first job in construction is the wings. The plans are full

size, so all you have to do is trace the wing pattern on a sheet of  $\frac{1}{8} \times 2$ " medium-size balsa and cut to shape the four half wings. Sand these to the airfoil given on the plan. When this is done glue in dihedral of both wings (making sure that both wings have the same amount of dihedral) and then set aside to dry. When dihedral is completely dried, polish wings with either clear or colored dope, whichever you prefer. The next thing is to cut out body from  $\frac{1}{4} \times 2$ " sheet of medium-hard balsa, sand to cross section as given on plan, and rub a coat or two of glue into body to strengthen it before polishing. In cutting out slot for lower wing be sure that it is set at  $0^\circ$  incidence (this is very important) and cut groove for upper wing which must also be set at  $0^\circ$  incidence. Then glue lower wing in place. When it dries, glue on upper wing, and while that's drying, cut out stabilizer and rudder from  $\frac{1}{32}$ " sheet balsa. Sand these to streamline airfoil, polish. Glue stabilizer to body, setting it at  $0^\circ$  incidence. Then glue on rudder, and cut wing struts from  $\frac{1}{8}$ " sheet balsa, sand to streamline and glue to position as indicated on plan. (Turn to page 58)



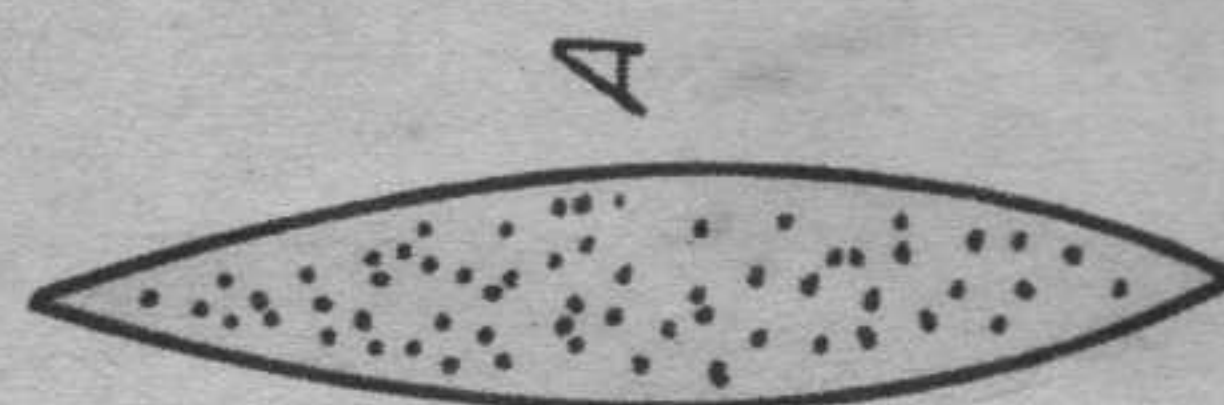
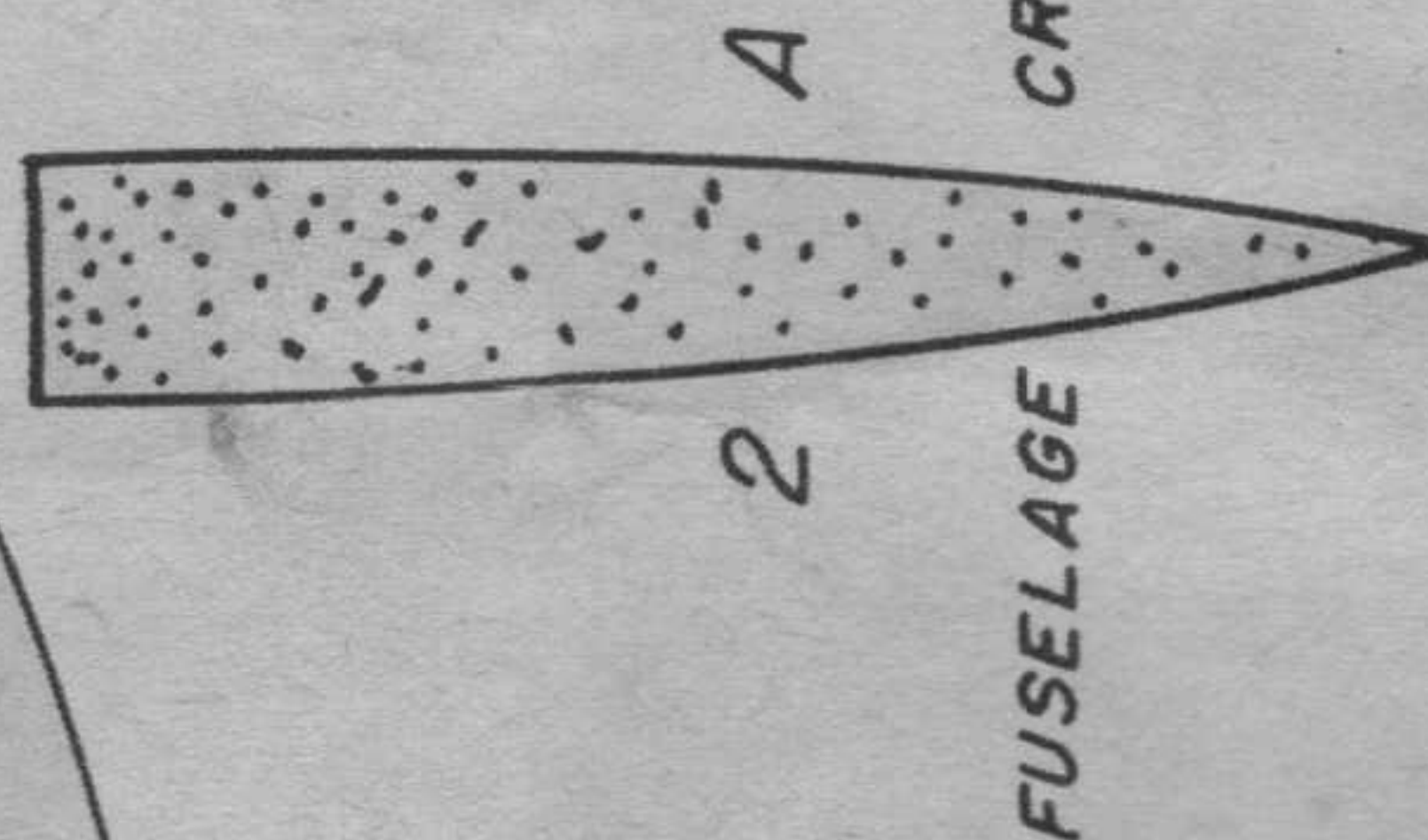
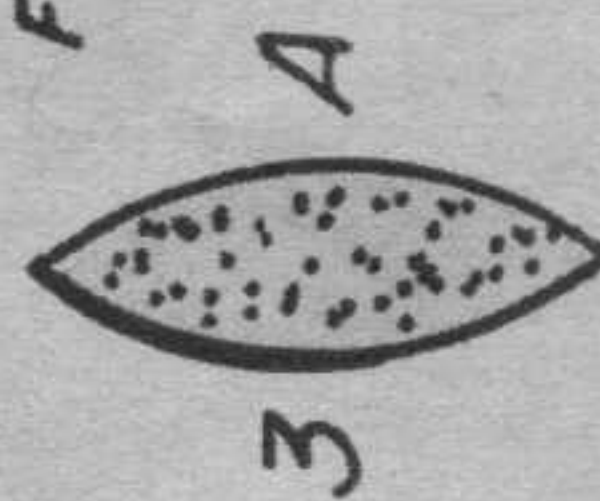


RUDDER TEMP.  $\frac{1}{2}$  STAB.

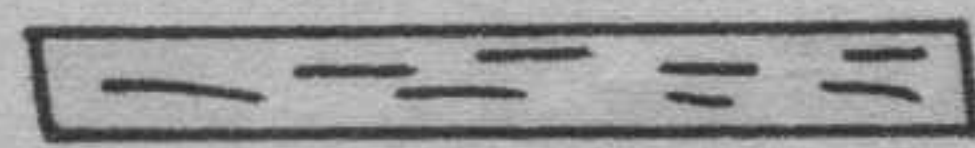


BILL OF MATERIALS

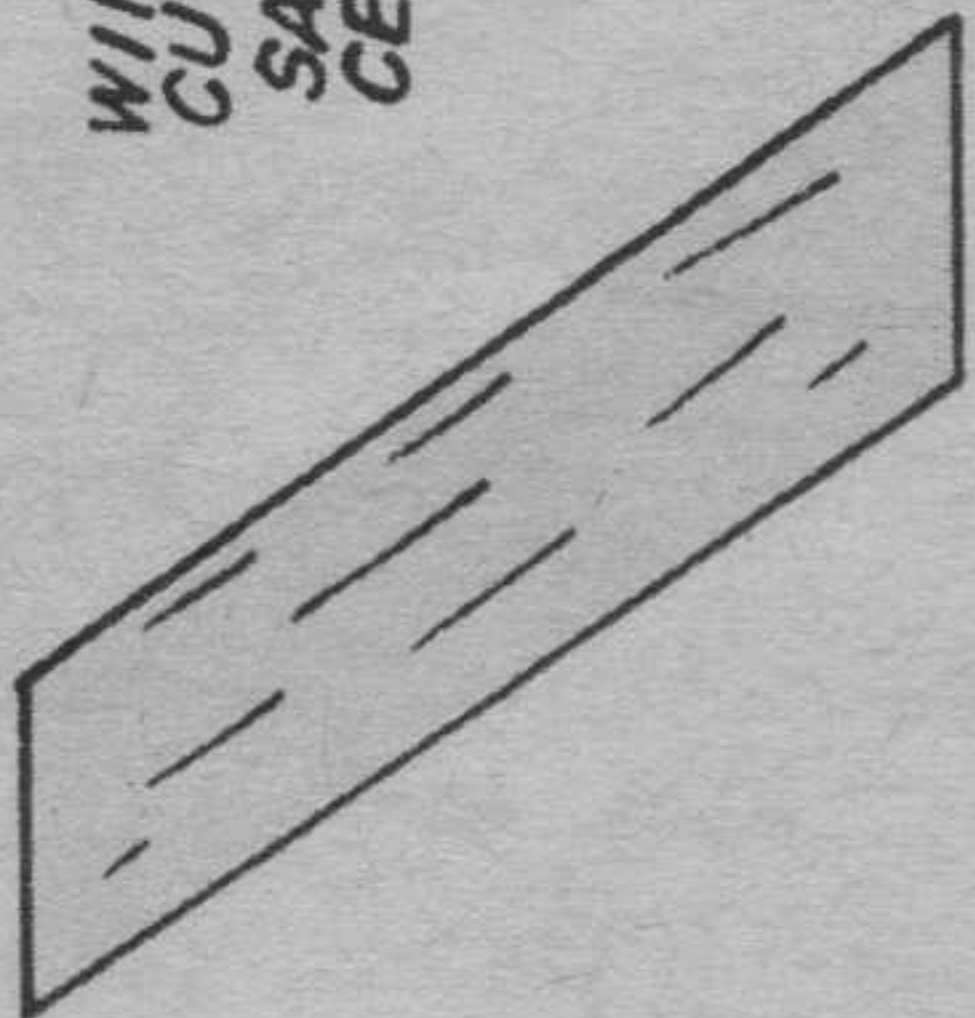
FUSELAGE —  $\frac{1}{4}$ " X 2" X 15" 1 OZ. CEMENT  
 WING —  $\frac{1}{8}$ " X 2" X 30" 1 OZ. GLIDER POLISH  
 TAIL ASS. —  $\frac{1}{16}$ " X 2" X 12" WAX, CLAY, SANDPAPER



CROSS SECTION'S

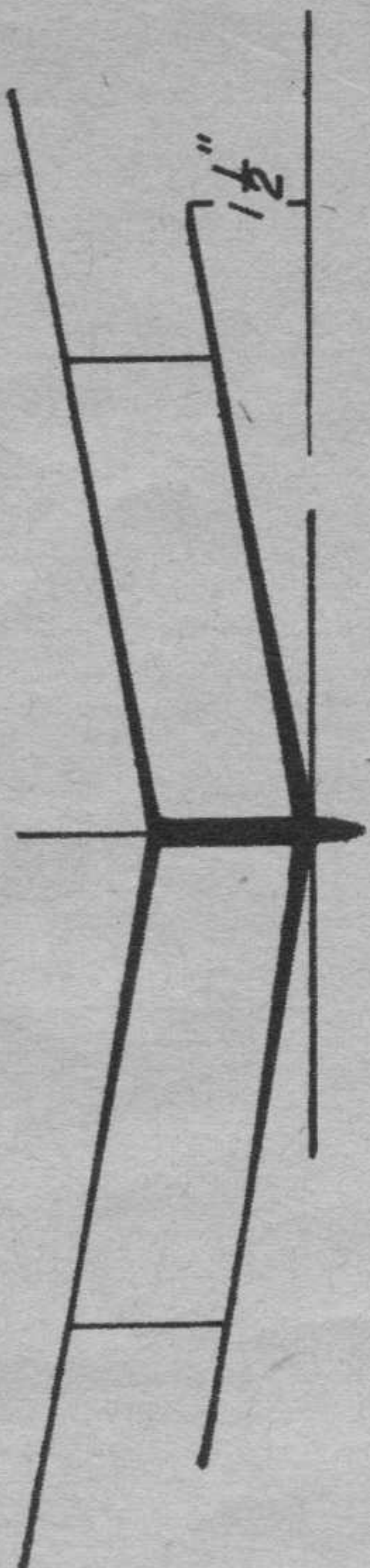


FRONT VIEW



SIDE VIEW

WING STRUT FULL SIZE  
 CUT FROM ONE EIGHT SHEET  
 SAND TO A STREAMLINED SECTION  
 CEMENT IN PLACE BEFORE WAXING



FRONT VIEW  $\frac{1}{4}$  SCALE

NOTES

CLASS (B) H.L. GLIDER  
 FLY IN TIGHT CIRCLES  
 GIVE ALL PARTS AT LEAST 5 COATS OF POLISH, SAND BETWEEN EACH.  
 CEMENT ALL JOINTS WELL.

BEST TIME 2 - MIN. 32- SEC.  
 USE 0° ON ALL SURFACES  
 WAX ALL LIFTING SURFACES

CLASS-B-H.L. GLIDER  
 BY AUSTIN RINALDI





# DOWN THE RUNWAY

Official aeromodeling news compiled by the Academy of Model Aeronautics, governing body of model aviation in America.

CONDUCTED BY AL LEWIS,

EXECUTIVE DIRECTOR

**Lucky 711?** One thing about the Academy of Model Aeronautics that makes it different from most organizations is that there are no free memberships or gas model licenses issued. In other words, any youngster can pay fifty cents or one dollar for a license with the knowledge that even the oldest enthusiast or important leaders in the model industry must also pay a similar sum if they desire to enter formal competitions.

Because of this it will be of interest to know that one of the newest licensees of the Academy of Model Aeronautics is that well-known problem child, Mr. Charlie McCarthy, whose protégé, a young chap named Edgar Bergen, is a well-known private flier and amateur ventriloquist.

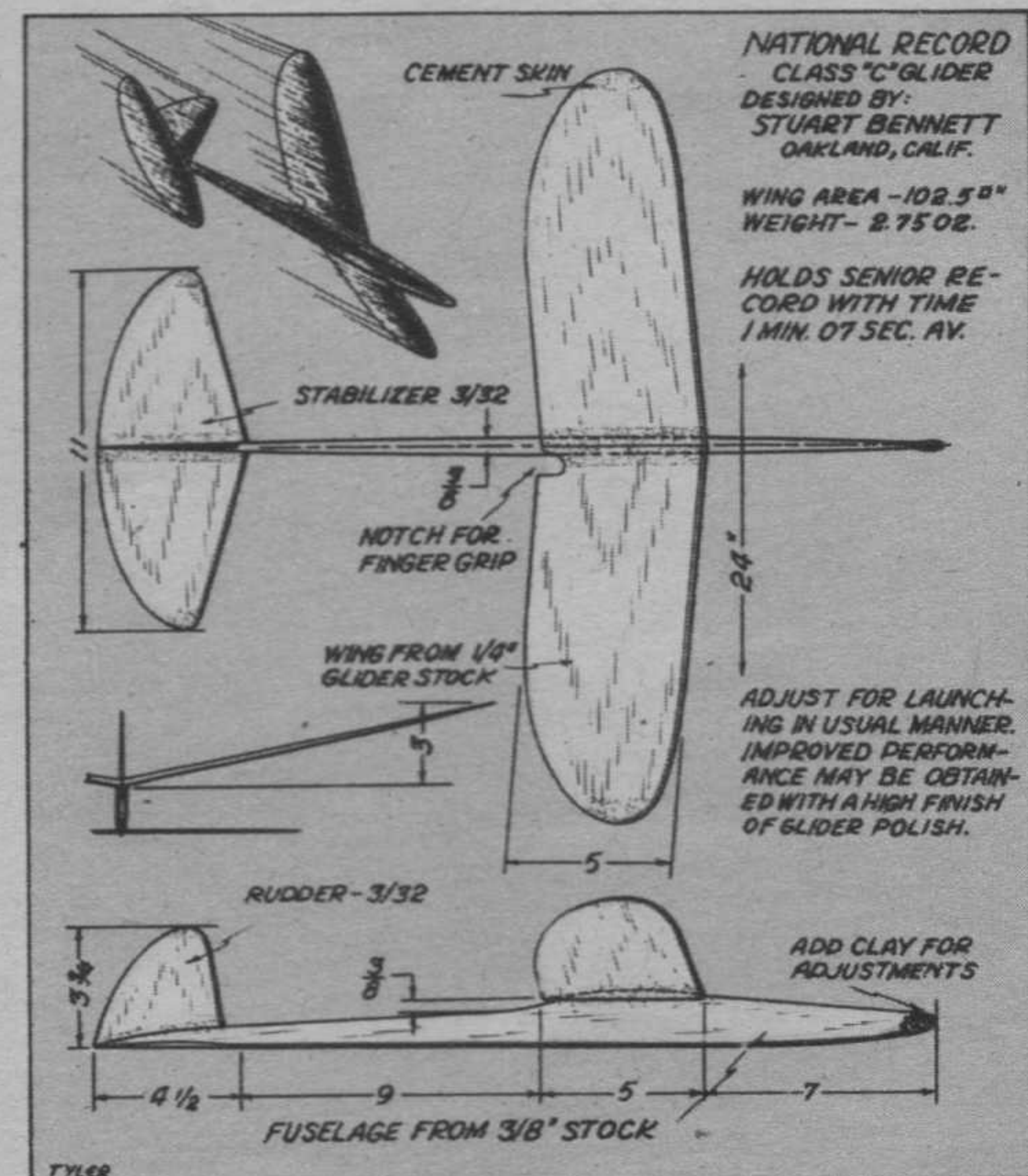
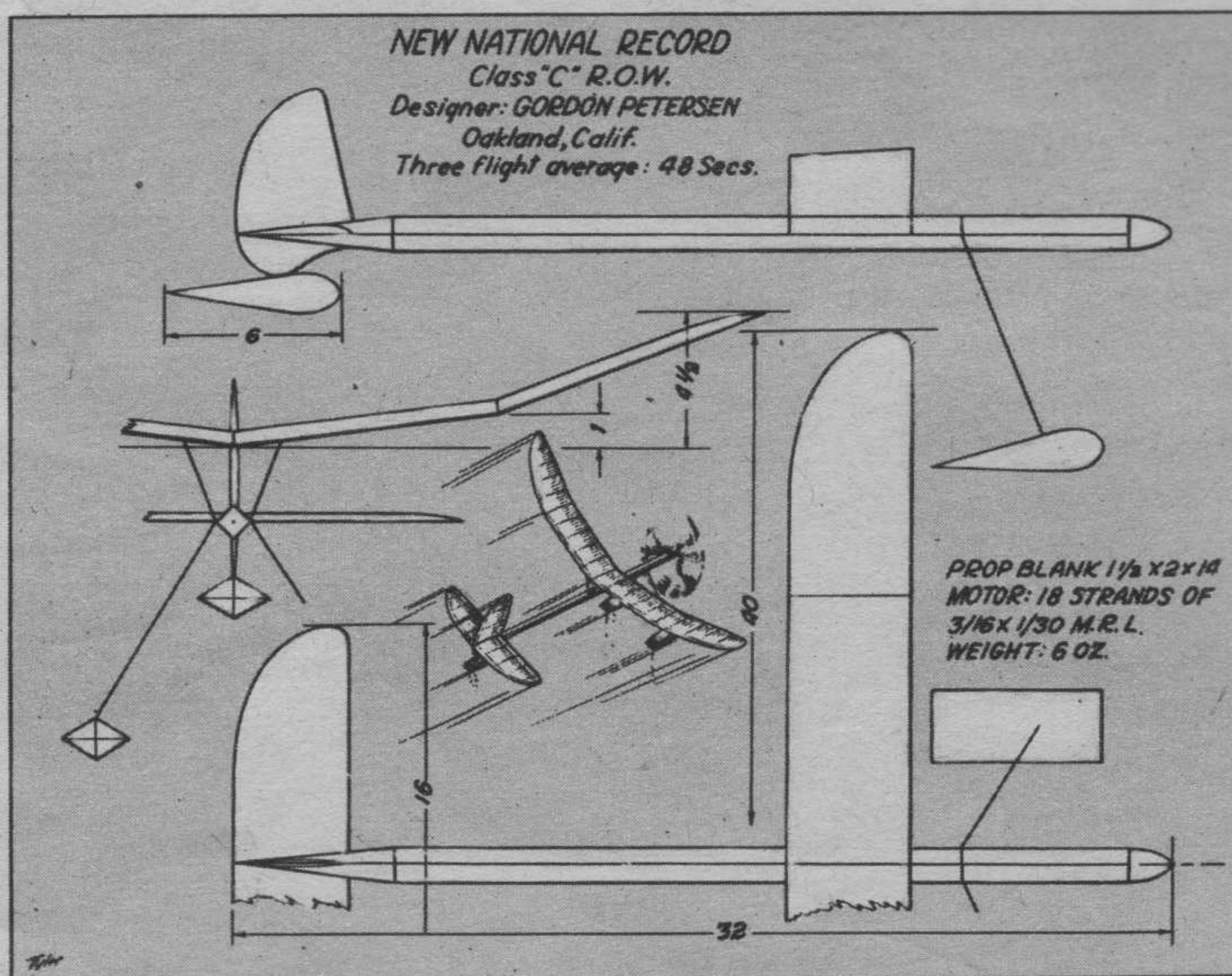
Modelers may recall young McCarthy's exploits with model airplanes which consisted mainly in scaring the daylights out of contest officials. It seems in one of the meets in which Charlie entered, according to subsequent revelations aired over a national network, that he took delight in mowing down the contest directors and it was only their agility and experience that saved them from being demolished by Charlie's craft. In forwarding McCarthy's application for gas-model license, this other chap, Bergen, said that Charlie has changed his way of living and

in signing the gas-model pledge has agreed to live up to the safety-first principles established by the Academy of Model Aeronautics. In recognition of this complete change of character, the A. M. A. officials awarded No. 711 to C. McCarthy, and at last reports he had received his credentials and was more than pleased with materials issued by Academy headquarters in Washington.

★ ★ ★

**A Few Plain Words.** In these times of national defense and increased aviation activity, model builders throughout the country, and especially leaders of the activity, must realize that they have a responsibility when it comes to flying model aircraft. Models must not be flown in congested areas near cities, near large highways, on or near established air ways, or on or near an airport without the full approval of the airport director. These are not just common-sense regulations set by the Academy, they are Federal rules and ones that cannot be violated under any circumstances.

A certain amount of laxity has crept into the model program with the introduction of thousands of new model fliers during the past year or so. That we must become more careful and considerate is evidenced through the following letter (Turn to page 58)





MODEL FACTORY

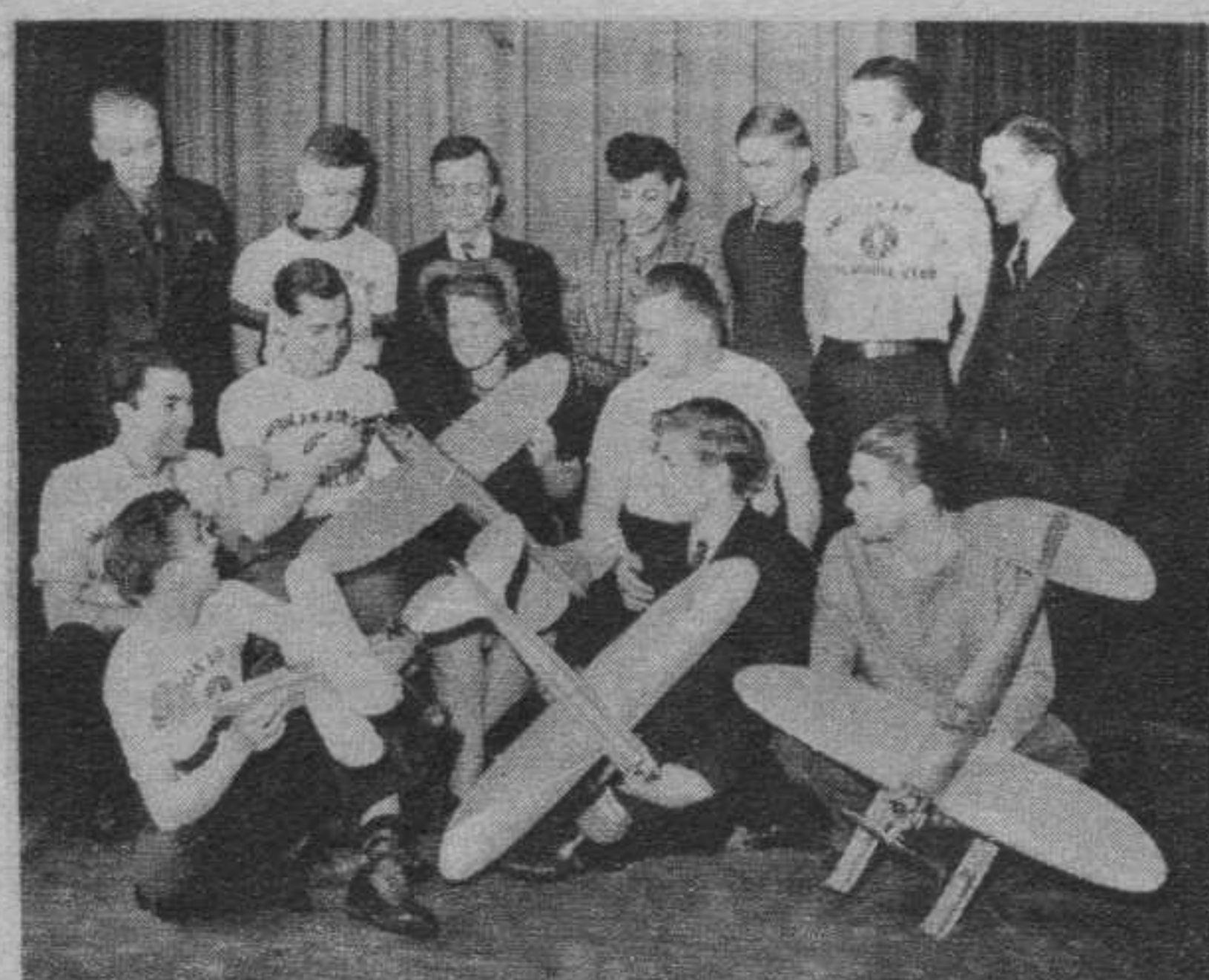


Harry McCall and Cleveland Shop.

## MACO MAKES GRADE

LIKE many another model airplane firm, the West Side Model Distributors of Cleveland, Ohio, started in life as a distinctly different enterprise. Back in 1933 H. D. McCall, president of the concern, launched a secondhand magazine firm in a corner of a plumbing shop in Cleveland. Maco—as his friends know him—was assisted by his wife, and the little firm added a few model kits and supplies as a side line shortly after the business opened.

The first shop was by no means pretentious. Library tables served as counters, but business was so good that within a month larger quarters were sought. The firm remained in the new location for two years, when it was moved to its present location at 9609 Lorain Avenue. By that time Maco really began to build up his model business, and after a visit to Chicago and the (Turn to page 66)



Harry runs American Airlines Club.

# “DON'T QUOTE ME!”

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

**Q**UERY: Is there any truth in the rumor that Jack Keener, Madewell Motors, Oakland, California, is contemplating the production of a Class B engine to sell for \$12.50?

We hear that Ohlsson & Rice Manufacturing Co. is thinking about capturing the medium-priced Class C engine market with a low-cost “60.”

At this writing there is still no word from the Model Industry Association as to what success their committee has had with the O. P. M. Looks bad!

The distributors of the Xacto line (high-grade hobby knives with surgical blades) will soon introduce one or two low-priced numbers selling for 15 and 20 cents.

High cost of paper board reflected in the price of boxes has affected tremendously the manufacturers of model kits, particularly the low-priced ones. Fred Megow urges some action by large users to prevent unjustified skyrocketing of box prices.

Ben Shereslaw, president of Miniature Motors, Nutley, New Jersey, manufacturers of the Bantam, is teaching drafting in a Newark defense school. If you cannot get any materials, might as well do something useful elsewhere!

American Junior Aircraft Co. is discontinuing its warehousing facilities in Bush Terminal, Brooklyn, due, no doubt, to the fact that every boat shipment east of this ever-increasingly popular line is sold before the boat arrives in New York. Shortage of material and steel have caused the discontinuance temporarily of the 10-cent Coast Guard models. Perhaps future versions will have plastic engines and nacelles!

The Comet 35, which has been going to town, is undergoing a few minor improvements in the arrangements of the extended needle valve. Bill Bibichkow of Comet Model Airplane Co. was in the East recently and visited the Academy's headquarters in Washington. He has been the “spark plug” of the Model Industry Association's Show Committee.

Berkeley is working on three Apache kits, based on the Air Trails design by Henry Struck. Plastic construction will be used extensively, eliminating need of shaping nose blocks, et cetera. Berkeley recommends their Brigadier for beginners. Ready in August, it will be a new streamlined.

Burd Model Airplane Co. has appointed D. D. Boselly, 5053 Range View Avenue, Los Angeles, California, their Pacific coast representative who will warehouse Burd's complete line of popular-price model airplane construction kits at 4207 N. Produce Plaza, Los Angeles.

This set-up enables Pacific coast dealers and jobbers to obtain Burd models without having to wait for the merchandise to be shipped from Baltimore.

Don't quote me, but it is being rumored that the largest stock of Strombecker airplanes, guns, boats, trains, Bill Dings and tanks in the State of Pennsylvania is now in a warehouse in Philadelphia. It might be wise for the Pennsylvania dealers who have experienced difficulty in getting their Strombecker orders filled to write to M. B. Spotts, wholesale model distributors, 3141 N. Broad Street, Philadelphia, who has *only* key to that warehouse.

Bill Effinger, Jr., of Berkeley Models in Brooklyn, honeymooned in Bermuda. We wonder if his Clipper flight will influence new design trends by Berkeley.



BY THE TRAVELING SALESMAN



# KING OF THE PROP FIELD

## 1941 D-G Propeller

New High Thrust  
with New Low Pitch

World's Fastest Clim-  
ing Propeller!!

# 25¢

HAND-SANDED

DESIGNED after the "Propeller Handbook" by Karl Hansson 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.

See the D-G Propeller Chart for Your Make and Age of Engine At Your Dealer's—  
or Mail Coupon Below.



"Modelcraft"—Los Angeles, California

### 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 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.  
Core in cleaning up the hub added some thrust, but more important, it eliminated what had been drag, small 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 ounces 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 developed hub.

Engine	Prop Size (in)	Prop Size (in)	Prop Size (in)	Prop Size (in)	Prop Size (in)
Atom	7"	8"	9"	10"	11"
Bantam	10"	11"	12"	13"	14"
Bart	11"	12"	13"	14"	15"
Brown B. C. M. D.	14"	15"	16"	17"	18"
Brownie E	13"	14"	15"	16"	17"
Baby Cyclone	14"	15"	16"	17"	18"
Super Cyclone	14"	15"	16"	17"	18"
Barker	13"	14"	15"	16"	17"
Branch Engines	12"	13"	14"	15"	16"
Canal	14"	15"	16"	17"	18"
Deweyville	14"	15"	16"	17"	18"
Little Dynamite	11"	12"	13"	14"	15"
EF	11"	12"	13"	14"	15"
Forester 20	13"	14"	15"	16"	17"
Gunn	11"	12"	13"	14"	15"
Husky IV	11"	12"	13"	14"	15"
Hurler	13"	14"	15"	16"	17"

REMEMBER—Your engine is no better than its Propeller.

## MODEL CRAFT

"Largest Supply House in the West"  
7308 So. Vermont Ave., Los Angeles, Calif.

Gentlemen:

- ☐ Please send D-G Prop Chart
- ☐ Send.....D-G Props (25¢ ea.) for

Make of Motor

Year Bought

Name.....

Address.....

## Nomad

(Continued from page 44)

they have proven less sensitive than the double type. Most persons remark about the long moment arm employed. This is to handle the "hot" motor at full power. The mid-wing was chosen for a speedy, unhesitating climb, and because a cabin could be placed over the wing blending with the design nicely. For more realism a dummy pilot was carved which added a great deal to the appearance. Why not try him in one of your future ships?

### CONSTRUCTION

We'll start with the pod first by laying out the center line, marking intervals of three-quarters of an inch and then connecting, which will form the graph. If you don't care to use this method, use a pair of dividers and enlarge six times. Mark out the location of the bulkheads accurately by using the dimensions from the top view. Be sure to use hardwood for the four keels. Follow the steps shown for the construction of the pod fuselage. In planking use soft sheets of  $\frac{1}{8} \times 2 \times 18$ " that are cut to a width which can be worked easily, about two inches wide on the shallow curves of sides and about one-half inch wide on the sharp curves of the top and bottom. Taper the tail ends down, of course, and wet the outside of the pieces before gluing in place. This simplifies the job a great deal. After planking is completed and roughly sanded, cut out the tail block from a piece of soft wood  $2\frac{1}{4} \times 3\frac{5}{8} \times 4\frac{1}{8}$ ". Apply a coat of cement to rear bulkhead and tail block. Let them dry and apply the second coat on both, then put together. This must be cemented well because the tail boom is attached to it.

The plans show clearly the various steps in the construction of the tail boom. Just remember to put a strip of wax paper under the seam before you glue the first layer. Also keep the core free at all times by moving it out slightly, as each layer is cemented. If this isn't done the drying cement, which contracts when drying, will make a very tight fit and make it necessary to cut and re-

ment. You don't have to soak both sides of the sheets; just the outside of the bend will do the trick. Each layer is to be formed and dried before gluing.

After the boom is finished it is ready to be attached to the pod. Set the pod on a level keel first, holding in place with blocks of wood, books, et cetera. Cut the large end of the boom to fit pod, using the plans as a guide. When fitted correctly, coat both with a generous amount of cement and put in place. Check with a level to see that it is right. After setting for at least eight hours, mix some balsa dust with glue to the consistency of a paste and apply at joint, making a generous fillet. Let dry twenty-four hours and sand to a smooth surface. This is the whole strength of the connection, so do it well. It's surprising how strong this mixture is when properly worked.

Finish the pod and boom down with coarse to fine sandpaper. Apply three coats of wood filler and one coat of clear dope, sanding carefully between each coat.

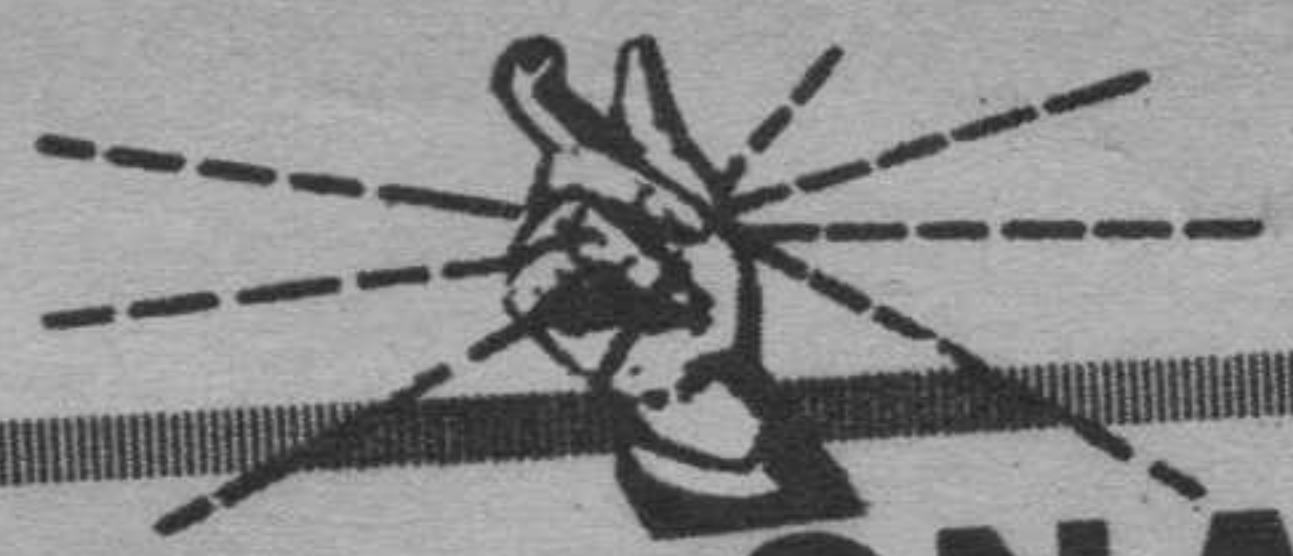
Form the landing gear from  $\frac{1}{8}$ " spring steel wire and attach with aluminum fittings as illustrated. The wheels can be made from two layers of  $\frac{1}{2}$ " sheet balsa  $3\frac{3}{4}$ " diameter, or regular  $3\frac{1}{2}$ " air wheels may be used.

Construction of the wing is conventional. Enlarge the plan six times with a pair of dividers or ruler as you did for the pod. The airfoil section is the Goettingen 239. This was selected from a series of airfoils tested at twenty-nine feet per second (twenty miles per hour). Full data and ordinates along with many other sections are given in the N. A. C. A. Report No. 124. The airfoil was thinned slightly, sacrificing a slower sinking speed for a higher rate of climb.

The ribs are cut from  $\frac{1}{16}$ " sheet, except the three center ones which are  $\frac{1}{8}$ " sheet. Cement ribs to top spar. Attach trailing edge, being sure front edge is raised to match the undercamber. The leading edge is glued in place next. Slide rear spar in place, gluing each rib securely to

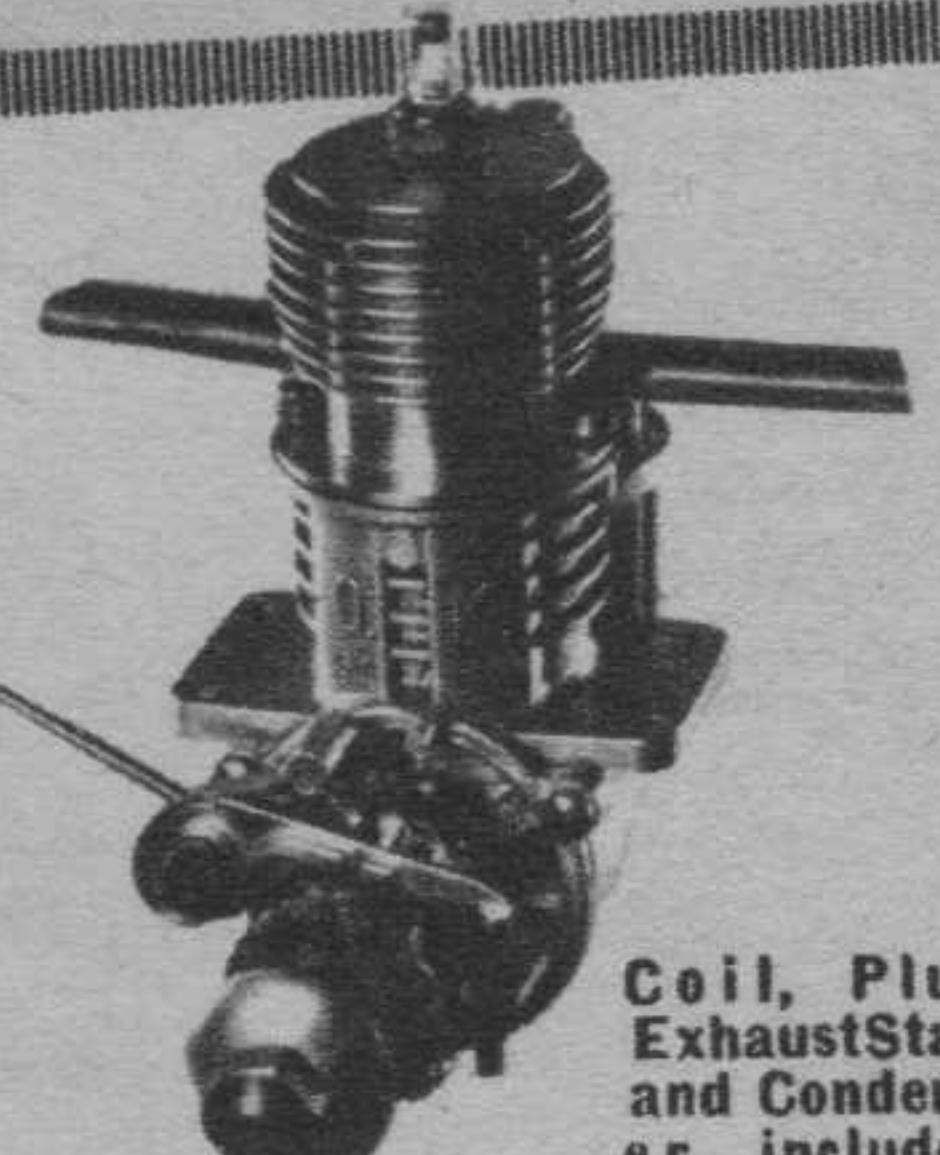


Bomber formation seen from belly turret of B-18A.



## It's a SNAP To Start 'OK' ENGINES

"49"  
Sensational  
Class 'C' Super  
\$15.50



## Consistent

Flip an 'OK' engine once or twice—and up she roars! You'll never get shut out because of balky starting! Try it, the next time you visit your dealer! And talking about PRIZE-WINNING, have you observed the frequency with which 'OK' engines have led in important national and international competitions?

Model	Displ.	Engine
49	.493	\$15.50
Special	.604	15.50
DeLuxe	.616	19.50
Tornado (For race cars and boats)	.604	24.00
Twin	1.208	40.00

Leading Dealers recommend 'OK' engines. Illustrated brochure with wiring diagram (3c).

**HERKIMER Tool & Model Works**  
(Dept. 'AT') HERKIMER, N. Y.

## BALSA WOOD DEALERS—JOBBER

WE CAN FURNISH YOU WITH  
HIGH QUALITY SHEETS AND  
STRIPS ACCURATELY CUT TO  
MEET THE MOST EXACTING RE-  
QUIREMENTS. WRITE ON LET-  
TERHEAD FOR WHOLESALE  
CATALOG AND WOOD SAM-  
PLES.

**WATERBURY MODEL BUILDERS  
SUPPLY CO.**

119 CHERRY ST., WATERBURY, CONN.

**10¢** WILL BRING YOU IDEAL'S  
Huge Hobby Catalog  
**IDEAL** AEROPLANE &  
SUPPLY CO., INC  
Famous Since 1911  
24-26 West 19th St., NEW YORK

## RUBBER FANS ATTENTION

IT COSTS NO MORE—USE THE BEST—MRL  
1/32"—20 ft. 5¢—225 ft. 25¢ 7/64"—10 ft. 5¢—225 ft. 60¢  
3/64"—20 ft. 5¢—225 ft. 30¢ 1/8"—10 ft. 5¢—225 ft. 70¢  
1/16"—15 ft. 5¢—225 ft. 35¢ 5/32"—15 ft. 10¢—225 ft. 85¢  
5/64"—15 ft. 5¢—225 ft. 40¢ 3/16"—15 ft. 10¢—225 ft. 95¢  
3/32"—15 ft. 5¢—225 ft. 50¢ 1/4"—10 ft. 10¢—225 ft. 1.20

M R L Rubber Lubricant 1 oz. 10¢, 3 oz. 25¢  
M R L Microfilm Solution 3 oz. 30¢, 1/2 pt. 65¢

ALL PRICES POSTPAID. NO  
ORDERS UNDER 50¢ ACCEPTED  
Send 3c for your 1941 Price List.

**MODEL RESEARCH LAB**  
3531 T North Western Ave., Chicago, ILL.



it. At this stage put in the required dihedral by butting the leading and trailing edges. Raise each tip 4" above your working surface. As soon as the breaks are glued and thoroughly dry, cut at center section and raise each tip to 9½" and cement carefully.

The leading edge is covered with 1/16 x 3" soft sheet to form a good entry and to gain extra strength. Center section is covered on top and bottom with some thickness. The underside of the leading edge is not covered with sheet as above, but is capstripped for the full chord. The wing capstrips are 1/16 x 3/8" and are of very soft wood. Shape leading edge and tips with a knife or a small hand plane, finishing with sandpaper to provide a smooth covering.

"The original model was covered with silk and this is recommended. Paper can be substituted, however. Use clear dope for applying the silk and a mixture of half dope and half glue for covering with bamboo paper. Spray covered wing with water. Let it dry. Follow with one coat of clear dope.

Construction of the rudder and stabilizer will be the next step. Enlarge the plan first. Taper stabilizer spar from 1/4 x 1/2" to 1/4" square at the tips. Ribs are made from 1/16" sheet and will be glued in place on the spar. Shape the trailing edge before cementing to the ribs. The leading edge is made in two pieces and the tips are cut from 1/4" soft sheet. Shape the four tip ribs, then cap with 1/16 x 1/4" strips on top and bottom. The rudder is made in the same way, using 1/4" sheet as the outline. Be sure to raise 1/8" above surface to make the section symmetrical. When covering and doping be careful of any warping tendency.

Since the pod was made in one piece, it will be necessary to cut the cabin part loose. First mark with pencil the exact part that is to be cut loose. With a sharp blade cut through the planking and top of the firewall as shown. Then cut through

Bulkhead No. 2. This bulkhead may be trimmed to within a quarter-inch all around the cabin part or it all may be removed. Remember that is for the cabin only and not the lower part. With No. 2 removed proceed with No. 3. It isn't necessary to trim No. 4, just cut it straight across so the cabin may be lifted off. Cement the windows and the windshield in now. Be sure to use a piece of paper for a pattern, employing the cut-and-try method in order to get the exact shape. Trace on the celluloid, cut out and cement the two halves in place.

When installing the wiring follow the diagram as shown in the drawings, being sure to make your wiring neat by soldering all connections where needed.

The original model was colored red. About thirty percent orange dope was added to achieve a red-orange color. Three coats were used on wing and tail, with four coats on pod and boom. Sand lightly between each coat with 400A wet or dry carborundum paper. Water is used with it to cut faster and more evenly for a smooth finish.

### FLYING INSTRUCTIONS

Move the batteries until center of gravity is in correct place as shown on the plan. When this is done attach the cabin, using several strips of transparent cellulose tape to do the job. Test-glide the model until you become thoroughly familiar with it. Increase the incidence in the stabilizer if it shows the least tendency to stall and use negative incidence if there are any diving tendencies. Start motor, run at half throttle and launch just as if you were going to glide it. The timer should be set for about ten seconds. The Nomad should circle to the left under power and to the right in the glide. When adjusted properly and with an opened motor you can count on 2½ minutes every flight.

Until we meet again—many happy landings!

## Slide, Rule, Slide!

(Continued from page 48)

uninformed persons, this can be described as "flat as a pancake" or even "as level as a billiard table" if your friends are all pool sharks.

### DURATION

All degrees of optimism are embraced in the following formula for calculating your duration on test hops:

$D = TE^2$  (D being your claimed duration, T the actual flight time, E the exaggeration.)

This formula accommodates both the big fibber and the medium fibber. For example, for the medium fibber:

T (actual flight time) is 1 minute. E is found by your estimate of motor run. If it actually runs 30 seconds, and you say it has run 15 seconds, your E factor is 2. Therefore D (your claimed duration) is  $TE^2$  or 1 minute x 2<sup>2</sup> or 4 minutes.

For the big fibber:

T (actual flight time) is 1 minute.

Your motor runs 30 seconds and you say it runs 10 seconds, so your E factor is 3. Therefore D equals  $TE^2$  or 1 minute x 3<sup>2</sup> or 9 minutes, your claim for this flight.

### GASOLINE CONSUMPTION

Your motor will run for at least 2 minutes on 1 eyedropper of gas. Even if it takes two or three tankfuls to get it started, you must still insist that your motor is quite frugal. If you must refill your tank after every 10-second flight, this can be explained by saying that your ship tipped up and the gas ran out, the gasket leaks, the tank leaks, et cetera, et cetera.

### RECORD FLIGHTS

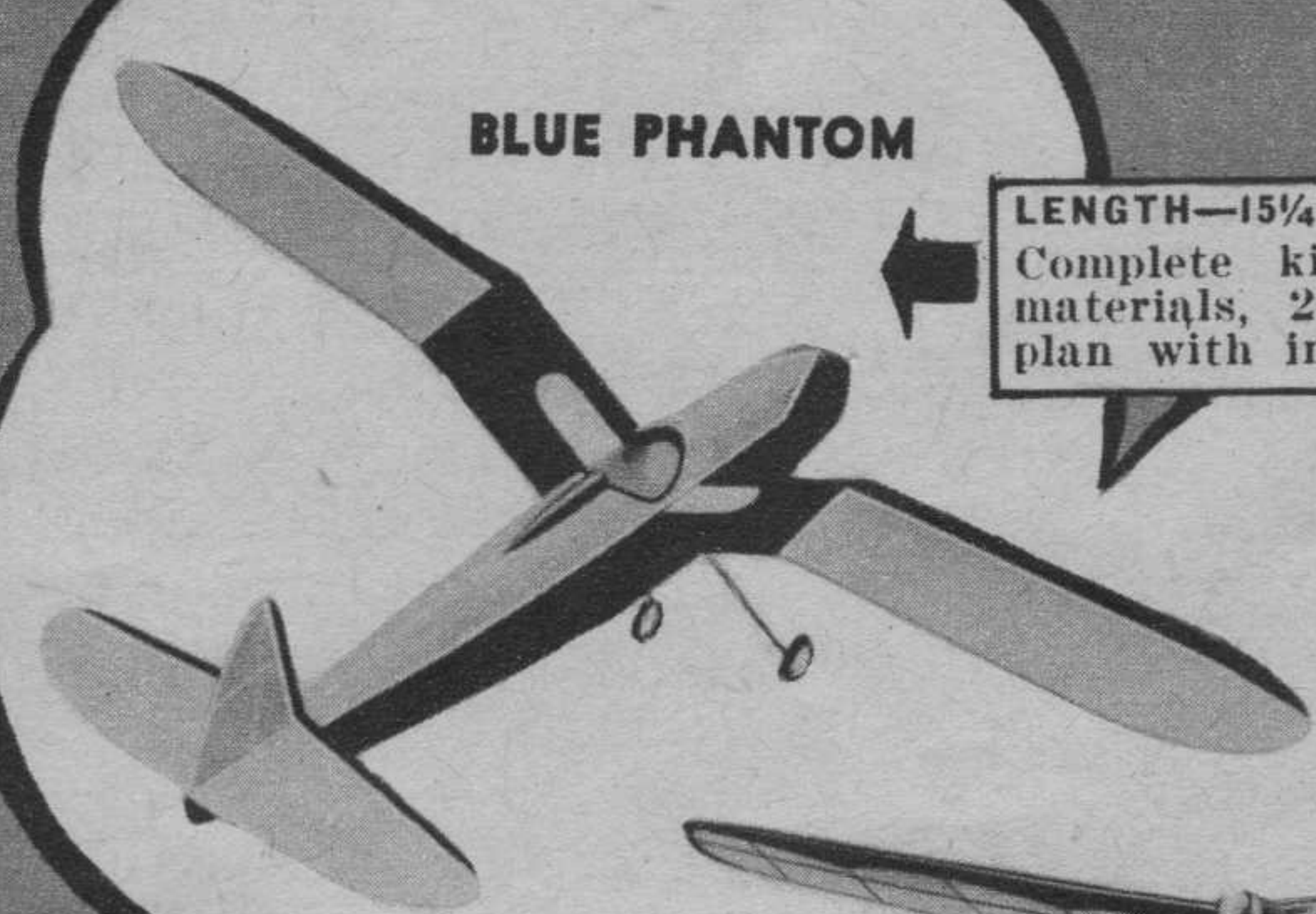
If you will make a practice of closing your eyes tightly for about five or ten seconds during the glide, a very fine total of "out-of-sight" flights may be claimed.

# NEW! Scientific's 25" WINGSPAN

## Fleet of Champions


# 25¢

POSTPAID OR AT YOUR DEALER . . .



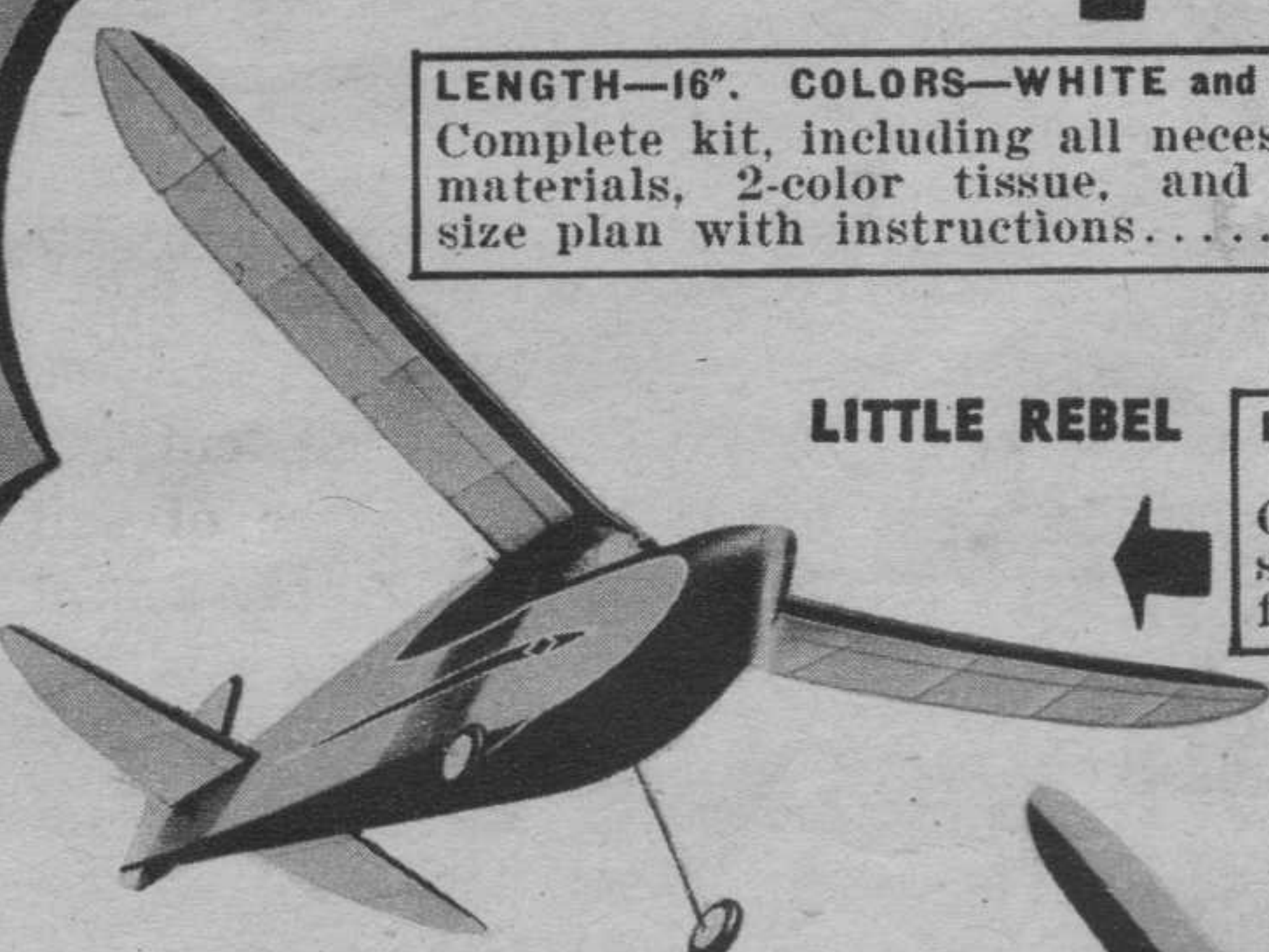
**BLUE PHANTOM**

LENGTH—15¼". COLORS—BLUE and WHITE.  
Complete kit, including all necessary materials, 2-color tissue, and full size plan with instructions. . . . .25c




**WIZARD**

LENGTH—16". COLORS—WHITE and RED.  
Complete kit, including all necessary materials, 2-color tissue, and full size plan with instructions. . . . .25c



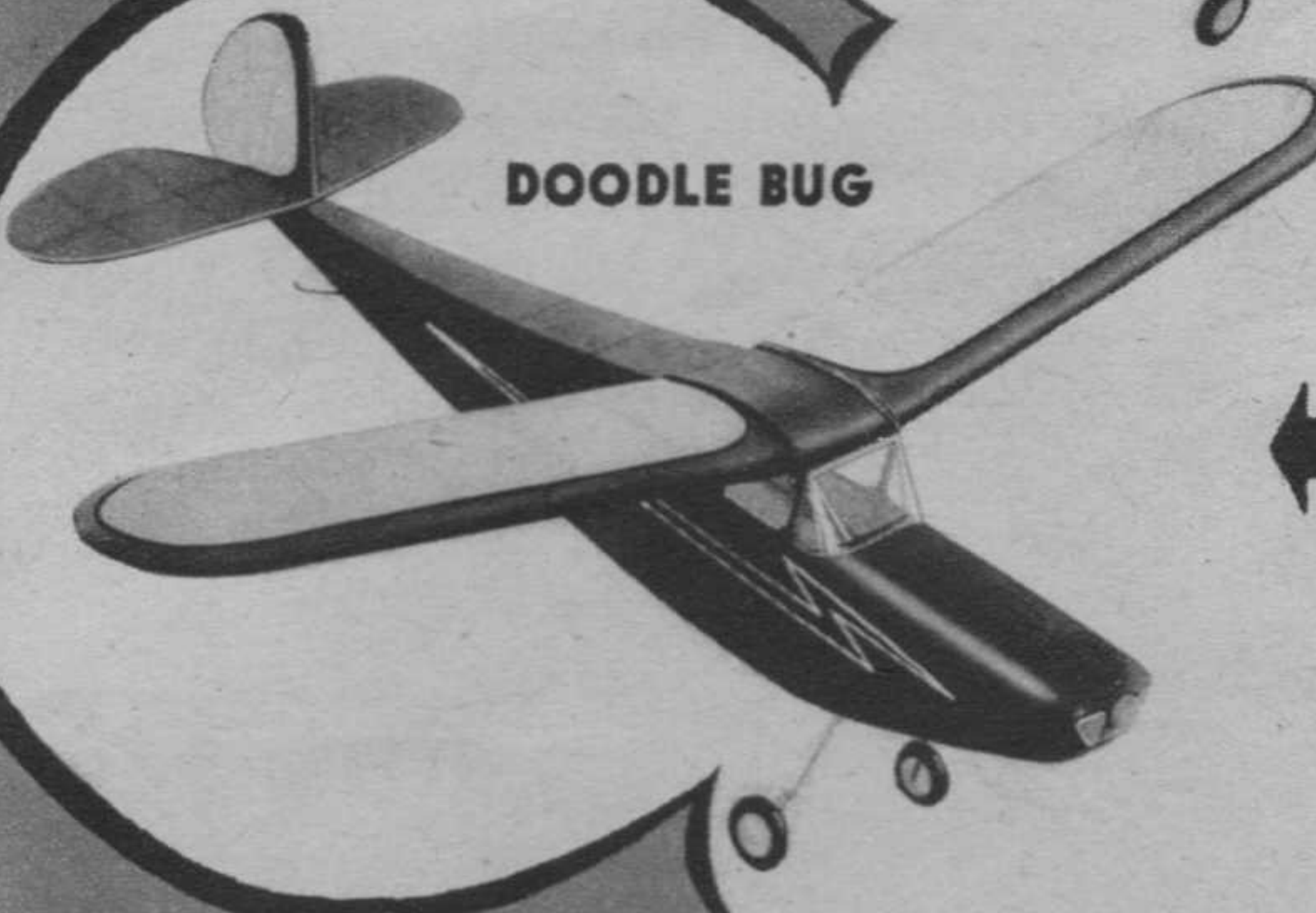
**LITTLE REBEL**

LENGTH—16¾". COLORS—BLUE and ORANGE.  
Complete kit, including all necessary materials, 2-color tissue, and full size plan with instructions. . . . .25c




**SKIPPER**

LENGTH—15¼". COLORS—YELLOW and BLUE  
Complete kit, including all necessary materials, 2-color tissue, and full size plan with instructions. . . . .25c



**DOODLE BUG**

LENGTH—15". COLORS—RED and YELLOW  
Complete kit, including all necessary materials, 2-color tissue, and full size plan with instructions. . . . .25c



**AIR RAIDER**

LENGTH—15¾". COLORS—BROWN and YELLOW  
Complete kit, including all necessary materials, 2-color tissue, and full size plan with instructions. . . . .25c

Just Out!  
SCIENTIFIC'S  
NEW 1942  
CATALOG!  
Send  
5c

See Your Dealer or Order from

## SCIENTIFIC MODEL AIRPLANE CO.

"GAS MODEL HEADQUARTERS"  
218-220 AT-8 MARKET ST., NEWARK, N. J.



(Continued from page 52)

Now instead of having four tabs on the escapement disk we only have two. These are situated opposite each other. One of these tabs, which we will call A, is made slightly longer than the other. The escapement arm it will be noticed has two stops, one at the end of the horizontal part of the arm, and one at the end of the

We have installed this escapement in the ten-foot pusher RC-1, and have had very satisfactory results.

(Continued from page 54)

jobs near the scene of such activities."

"Matter of fact, I had always treated the problem of uncontrolled model aircraft pretty lightly as any sort of real menace to pilots—but one day, as I came in for a landing in a little field not far from Roosevelt Field, one of these gas-powered jobs whizzed out of the tall grass straight at my ship. Believe me, it was some moment! The model plane missed my ship's prop by a fraction—and I proceeded to neatly mess up my landing and leap four or five times across the small field like an enraged bullfrog. Of course I was mad—and scared to death!

The author of this message is not an aviator with no understanding of the model builder and his work. The writer is Miss Jeannett Eastman of New Rochelle, New York, a licensed pilot and member of the 99s, international organization of women pilots. Miss Eastman has been building model airplanes for the past few years and holds A. M. A. gas-model license No. 3642. Miss Eastman, who is one of the best-looking feminine model builders you could ever hope to meet, is a skilled craftsman and has achieved a considerable reputation in the built-up replica scale model competition field. She placed first and second in two of the largest scale-model competitions ever held and her metal-covered Gulfhawk is the result of months of careful work.

★ ★ ★

**Be Safe—Fly Safely.** The editors of *Air Trails* join with the Academy of Model Aeronautics in urging that all model airplane builders exercise extreme care in flying their craft.

This hobby-sport is too fine a one to restrict through carelessness on the part of a small number of model fliers.

*Be Safe—Fly Safely*, away from crowds or other air activity.

(Continued from page 52)

## FLYING AND ADJUSTING

Take the ship to your favorite flying spot and test-glide, adding clay to the nose to balance it and warping rudder for turn. When a long flat glide is obtained throw model into the air. For best launching hold one

finger behind wing, giving ship a little bank, and toss it straight out. When model is adjusted a higher altitude may be obtained by adding positive to stabilizer and taking a little clay off nose. From here on it is all yours, and lots of luck in flying.



# RADIO CONTROL

## SIMPLIFIED by the use of our

new self-neutralizing rubber powered escapement. One signal gives right—two gives left—comes back to neutral whenever you want. A worthy addition to our complete line of radio control equipment. Be sure to specify No. 122 Escapement. Ask your dealer or send 10c for Illustrated Instruction Manual which describes other equipment manufactured by us, and elements of radio control.

**No. 122 Escapement**  
**Weight 3.8 Oz.**  
**PRICE \$6.75**

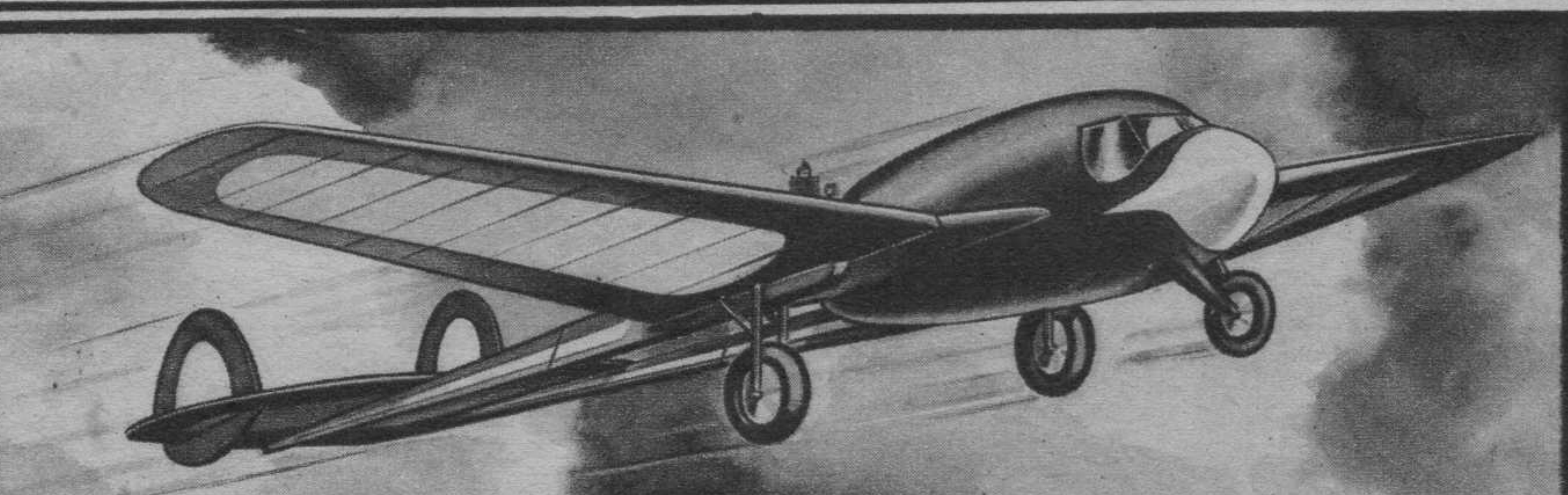
# RADIO CONTROL

330 WEST 42nd ST.



# HEADQUARTERS

NEW YORK CITY



Designed primarily for Radio Control, the RC-1 can be flown just as successfully without it.

Specifications of the RC-1: Span 10 ft. Weight without radio controls, 6 lbs. Will carry with ease 5 lbs. of control equipment for three way control, or can be equipped under 1 lb. for rudder control only.

Price \$15.00 less wheels & dope.

Apply to: CECIL WINIK, 330 W. 42nd St., New York City.



## Model Matters

(Continued from page 41)

Bob was seventeen years old, had attended several nationals where we got to know him. He won high-school varsity letters in track, was an expert tennis player, and a championship model builder. Last October Air Trails published plans for his Crusader, a contest-winning rubber-powered fuselage. The Stofers—Harold and Thelma—of Indianapolis, knew Bob very well and had taken him along to the contests. What they miss most of all is the pleasant and contagious smile he always wore, reflecting a happy outlook on life.

"If you can't beat 'em, join 'em," or something like that, should have been followed by a Philadelphia woman. Her husband was a model builder and she was recently divorced from him on the grounds that he spent so much time building models he neglected her and their child. Instead of this drastic action she should have bought herself some supplies and joined the model ranks. Many a wife has found she couldn't compete with the model hobby (which by the way is much more deadly than golf, stamp collecting, et cetera) so they, too, built and flew models—taking care never to get too good and embarrass their husband which would probably drive him to divorce!

Aëro speed merchants will have a chance to get it out of their systems at the Florida State Meet. A speed event for gas models tethered with a seventy-five-foot rope is included in the events. Speed events have always attracted builders despite the short course necessary and the difficulties in timing accurately a few seconds of flight. Pylon flying with gas models eliminates this trouble. A few rules can be formulated and a national record set up for planes of this category. After all, this type of speed event is all that model race-car fans have to look forward to in life. Looks as though it has possibilities for aëro-modelers. We hope William Thomas, Florida State AMA director, will tell us how this event worked out.

Anne doesn't live in Astoria any more. Unless, of course, Lars Johanson was lucky enough to find his 48" Bowlus-type glider which soared out of sight last April. He tow-lined it from Astoria, Long Island, and watched it climb steadily in sweeping circles, drifting out of sight on a southwest wind. It was built from a Cleveland kit. Color was red with black trim. The name Anne was painted on the pod-fuselage.

With defense claiming raw material and production facilities, the model industry may be forced to curtail production of motors and reduce the consumption of balsa wood and other special items. The Academy of Model Aeronautics was enough concerned to confer with the Office of Production Management regarding priorities in aluminum alloys and bronze, also rubber motor and balsa wood. AMA officials pointed out that model building forms a sound basic training for the aircraft workers and pilots who are so necessary. Model building has been an im-

portant phase of Germany's air-training program. Yet gas motors for model work are scarce. Few individuals own them because they're too expensive. Some of the larger clubs own one or two. Winners of rubber contests are allowed to use them for limited lengths of time. The Quaker City News Flash estimates that in Philadelphia there are more than 500 boys with at least one motor and many of them have two or three. Our gas activities are far and away ahead of any other country and our model effort should be given its share of material to keep the industries and the activity humming.

Of course, if the bottle necks get real tight, we can always use hardwood and specialize in gliders. For many years German competition has been limited to models built exclusively from material available inside Germany. Synthetic rubber motors were inferior, but otherwise the hardwood models stacked up favorably alongside balsa. So it looks as though true model love will find a way, regardless of what materials are available.

The Witch City Gas Model Club of Salem, Mass., has had a rough time with their contest weather. Mrs. Marjorie Day says they are not a bunch of sissy fair-weather fliers, but after all there is a limit. Sunday is model-flying day for the Salem crowd and invariably it was windy following six days of tantalizingly calm week days. WCGMC meetings have been featuring news-letters from other clubs which are read, discussed and digested by the club members. It's a good idea. We know our individual club is the best, but it wouldn't hurt us to review the doings of the little club in Frog Hollow. They might have hit upon something that missed us. WCGMC insignia is a witch riding a gas model. In case you don't quite get the idea, you better review Salem's part in early American history.

Organized model building in Jacksonville, Fla., is coming back strong. Model Aëro Club is the name of the new club. Last August the old club went under for the third time. Until recently the boys had been free-wheeling without any organization. Old-timers and newcomers have formed MAC and the heat is on. Acting Chairman Al Anderson is dishing out enthusiasm and information about MAC. You can write him at 416 West Eighteenth Street, Jacksonville.

Winter has come to Bungo-Bungo. As Cousin Hugo puts it—"It may be 92 in Jersey City, but it's winter down here." He explained that their seasons are always a half year ahead of ours. He hated to miss our national meet. For the last year he had planned the trip. It would have been nice to go north for the winter. But at the last minute he talked it over with the warden and the guards and they recommended he finish his course at reform school before leaving the country. He threatened to visit us for the 1942 contests. Meanwhile, he'll keep us posted on the breath-



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 mere'y 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.

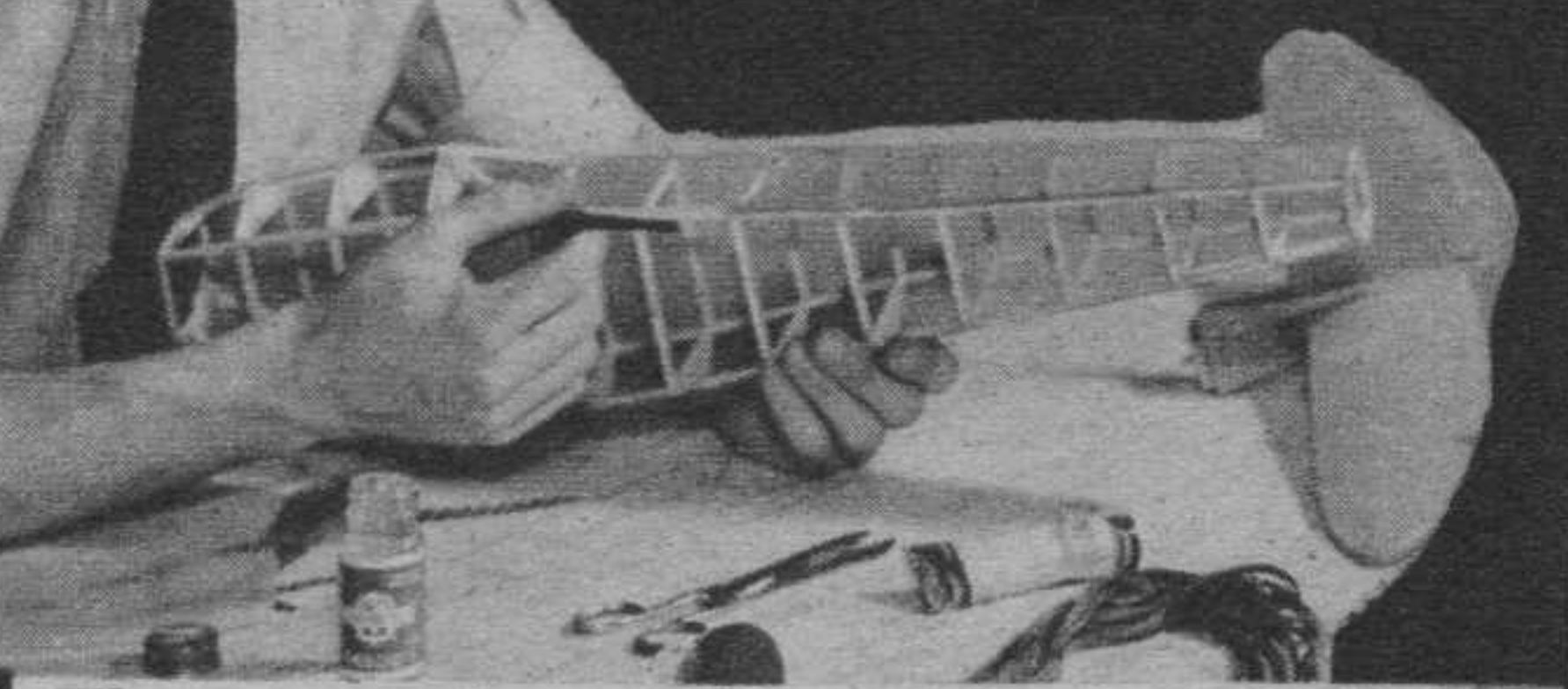
The 1941 Ohlssons are smoother, tougher, and engineered to the closest tolerances in the miniature engine industry . . . designed to uphold the Ohlsson motto: "The records are made with Ohlssons."

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

OHLSSON & RICE MANUFACTURING CO.  
P. O. Box 2324 Terminal Annex  
Los Angeles, California  
Mail this coupon or send postcard for NEW Ohlsson & Rice Folder just published.

Name.....  
Address.....  
City and State.....

## HOBBIES that make America First!



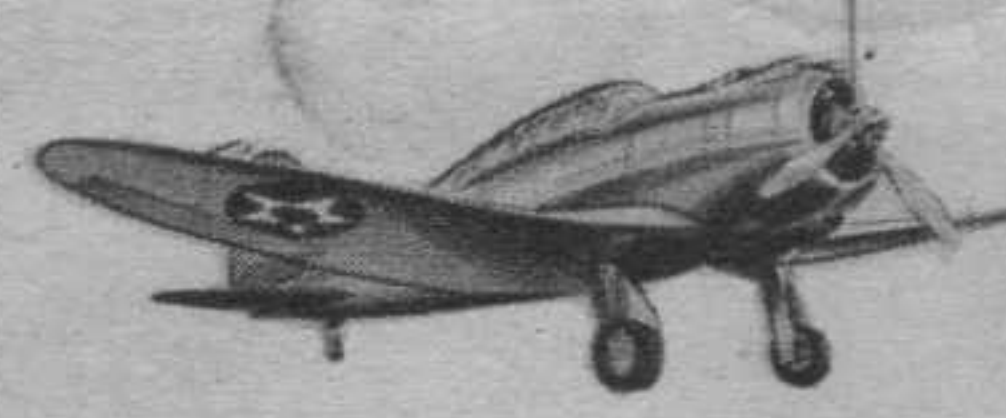
The tremendous upheaval in the world today points definitely to one thing . . . America must and will dominate the air! For years to come, aviation will be a foremost industry, and the men who will control it are the young men and boys who are building and flying model airplanes today. Many of today's aviation leaders started as model builders, and hundreds more are at work in the drafting rooms and experimental laboratories of the big aircraft plants. Model airplanes are the gateway to aviation, and Megow Models bring you the very latest developments. Megow now announces a whole new series of the world's latest fighting planes . . . six big flying models with 30-inch wing span at 50c each! Every kit is truly a Megow product, with all the superior quality and completeness that make Megow kits so different.

### Six New Rubber-Powered Flying Models 30-inch Wingspan, 50c each



SPITFIRE

**J18. SPITFIRE** — Famous fighter of the R. A. F. Sleek, easy-to-build, rubber-powered model and a graceful flier.



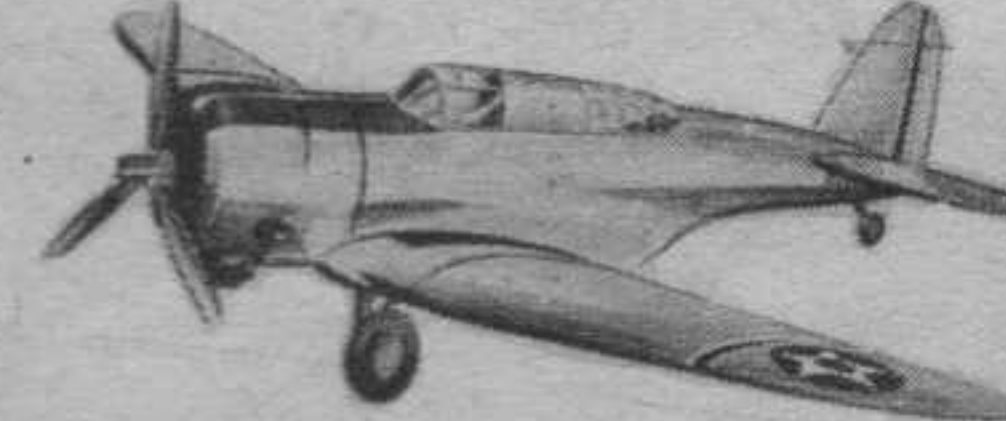
REPUBLIC GUARDSMAN

**J19. REPUBLIC GUARDSMAN** — Originally known as the Seversky fighter, it continues among today's finest. Like original except for bomb racks and load.



BLACKBURN 'SKUA'

**J20. BLACKBURN 'SKUA'** — A famous fighter carried on British Aircraft Carriers that has seen extensive service with the British fleet in sea operations.



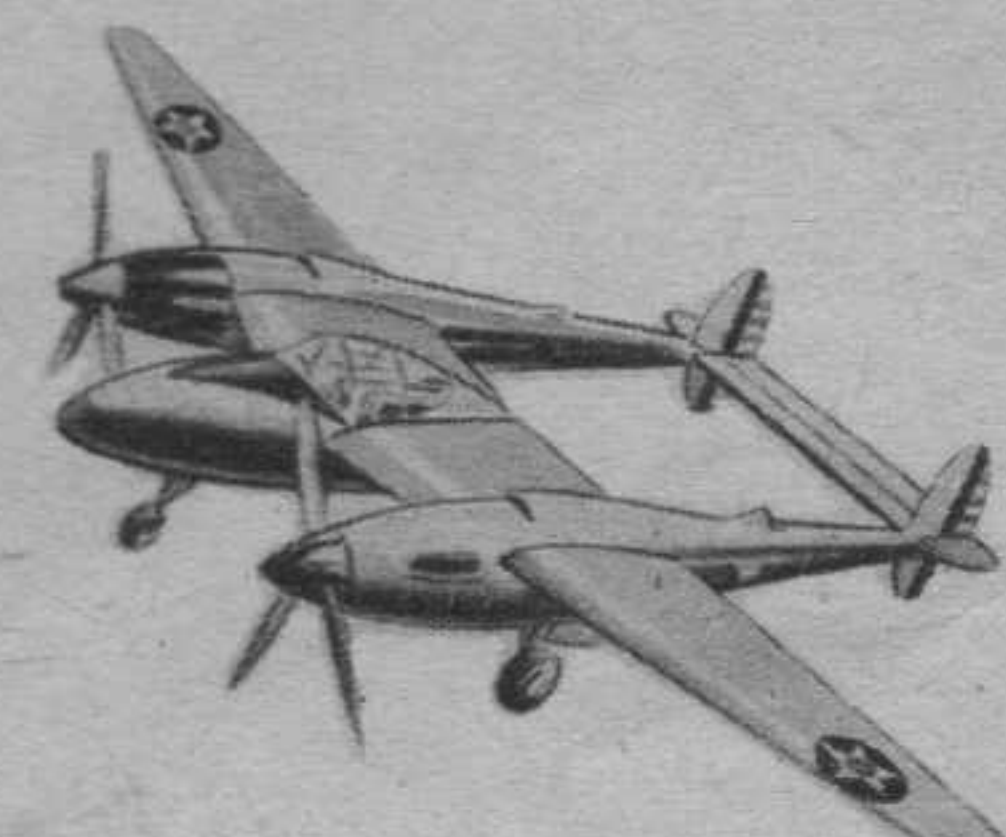
DOUGLAS 8A5

**J21. DOUGLAS 8A5** — Widely known American Attack Bomber. Attack bombers play an important part in modern warfare, largely supplanting long range artillery.



VOUGHT-SIKORSKY XF4U-1

**J22. VOUGHT-SIKORSKY XF4U-1** — A shipboard fighting plane with inverted gull-wing, better wing-to-fuselage streamlining and carrier-deck landing.



LOCKHEED INTERCEPTOR

**J23. LOCKHEED INTERCEPTOR** — Called "Lightning" by the British, the 2,200 H.P. original of this model is about to make history in warfare.

Send 10c today for the big, new 132-page No. 11 catalog, just out!

**Megow**  
PHILADELPHIA  
Dept. AT PA.



# FOLLOW THE LEADERS! CHAMPIONS KNOW THAT

**FLO-TORQUE** propellers are best and give you the "edge" in contest flying because—

- 1 FLO-TORQUE utilizes more than 85% of the engine power.
- 2 Accurately designed and machined to an exact formula.
- 3 Made of only the finest selected straight grained hardwood.
- 4 Acclaimed as America's most efficient gas model propeller.

**THE INVADER**  
**15c**  
unlacquered

**THE INVADER**  
**25c**  
lacquered

**FAMOUS**  
**FLO-TORQUE "35"**  
**35c**

ON SALE AT ALL BETTER MODEL SHOPS EVERYWHERE

**DISTRIBUTORS—**  
**JOBBER-DEALERS**  
Our National advertising has created a big demand for FLO-TORQUE and INVADER propellers. Write us now on your letterhead for details.

**FLO-TORQUE**  
**3150 CLYBOURNE AVENUE**  
**CHICAGO, ILL.**

Puerto Rico Distributor: Ramon Lopez Sanabria,  
16 Crist St., San Juan, P. R.

taking and thrilling-model news as it unfolds in B-B.

A letter to the editor of *Aëro Modeller* (English) published in the February, 1941, issue gave American modeling a pat on the back. Hugh C. Furneaux was the writer. He liked the sensational progress made over here in gas design and in radio control. Praised the Academy of Model Aëronautics organization and policy and said they were more effective than the corresponding English organization, Society of Model Aëro Engineers, which he accused of having a somewhat stuffy and reactionary policy. He liked the plans for championship models and articles by experts presented in our model literature.

Following publication of this letter, the English boys jumped on Mr. Furneaux and began to take our model set-up apart. Comments were that American modeling was confined to producing kits and engines to suit the pockets of all from twelve years old upward and selling them to thousands of people who probably don't know the first thing about power modeling. The SMAE was defended in glowing terms along with unfavorable criticism of our AMA.

Mr. Furneaux's letter was refreshing. Too often criticism from England left the impression that they thought American models were hodge-podge collections of sticks that always caught lucky thermals. Commenting editorially, the *Aëro Modeller* sensibly analyzed the argument: "... It is all a question of outlook. So many people in an argument of

this sort overlook the fact that models are built and designed to meet very different conditions. It is not possible to compare fairly a typical American with a typical British plane, as, of course, they are designed to meet two entirely different sets of conditions."

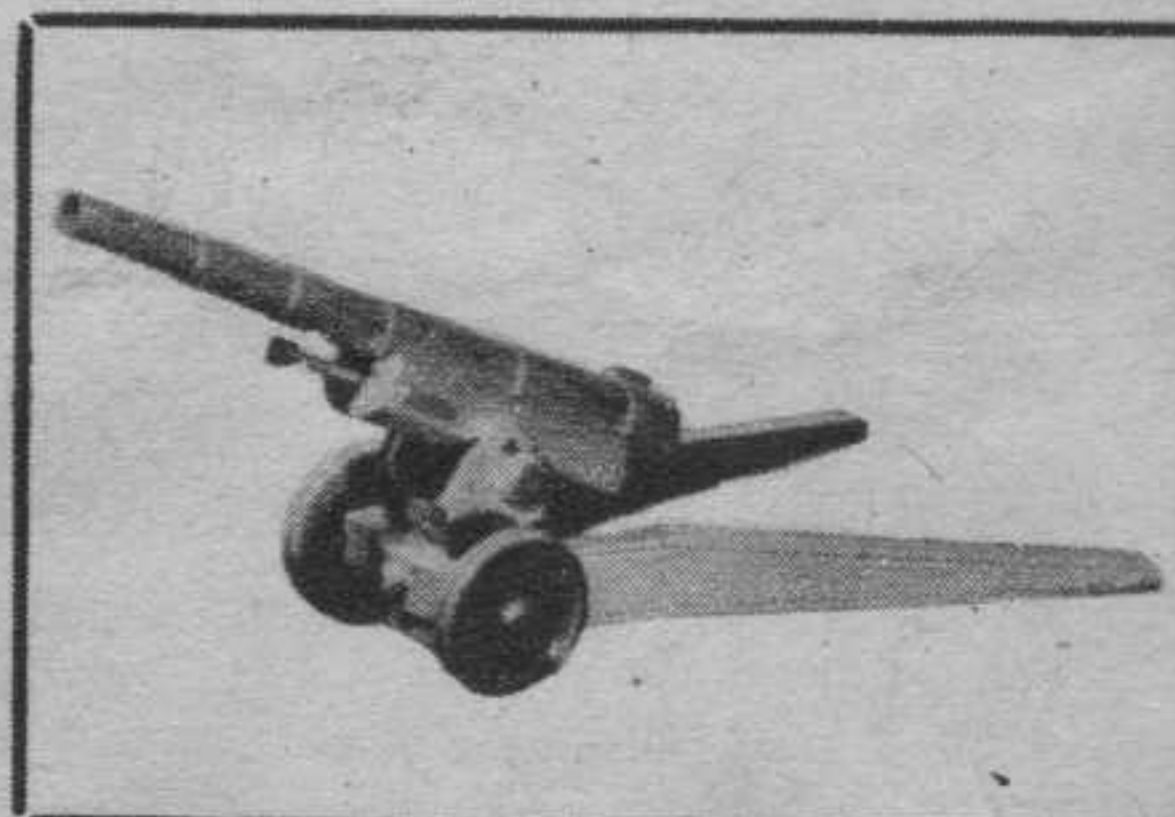
**ON THE FIELD.** (By Carroll Moon.)  
The season of contests is with us. Once more we feel the urge to attend the almost weekly meets, to hear the roar of "hot" motors, and to lose our ship on the runway in the hope that it will "catch one" and "stay up."

As this is written we have before us a score of contest announcements. By the time these words have reached the printed page most of the contests will be history. The Eastern States (June 7th at Hadley Field, N. J.) is the biggest thing on the contest horizon. Right now in our basement shop a wing is being built for that great day. If you insist, it's a Buzzard wing, although only 90% the size of the original—the better to accommodate an OK 49.

Yes, the contest season is with us. We'll have reams of material in the coming months about great performances and we earnestly request all publicity chairmen to get the results to us as soon as possible after the last prize has been awarded.

San Francisco modelers report, by means of a news page in the *San Francisco News*, the results of weekly contests. The publication, a Scripps-Howard unit, is actively behind model flying and the publicity does modeling a great deal of good in that area.

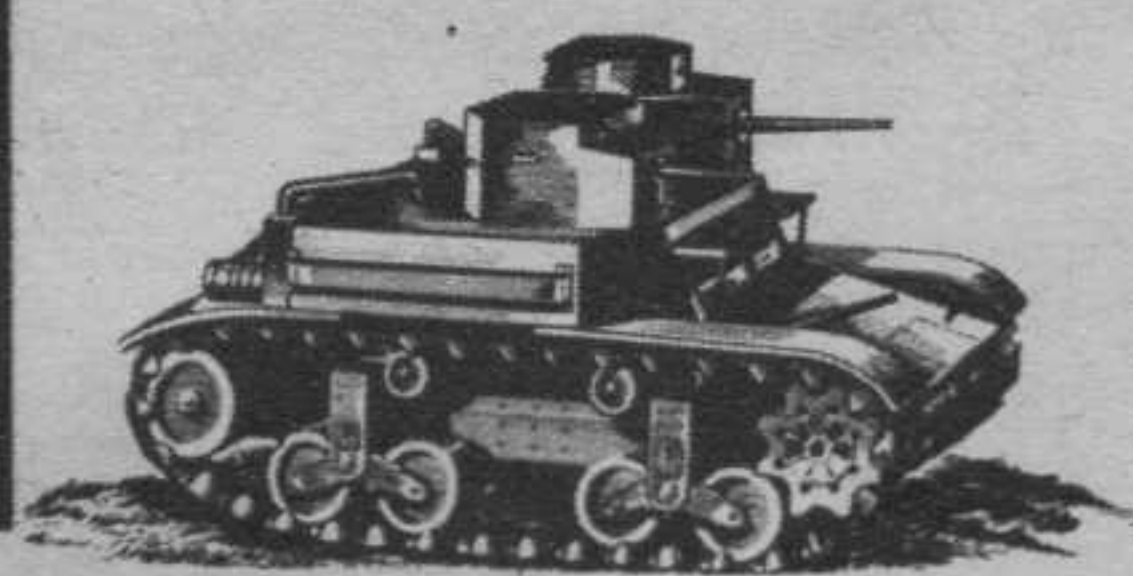
## BUILD THESE NATIONAL DEFENSE MODELS



**155 MM GUN**  
One of the main heavy artillery pieces. Full detail solid model. Length 10½", Height 4½".



**CONSOLIDATED NAVY PATROL BOMBER PBV-1**  
Used extensively by the U. S. Navy and for trans-Atlantic service. Add this authentic solid wood scale model to your collection. Wing spread 10½".



**U. S. ARMY LIGHT TANK**  
A fine detail scale model. Quickly and easily assembled.

35c each p. p.

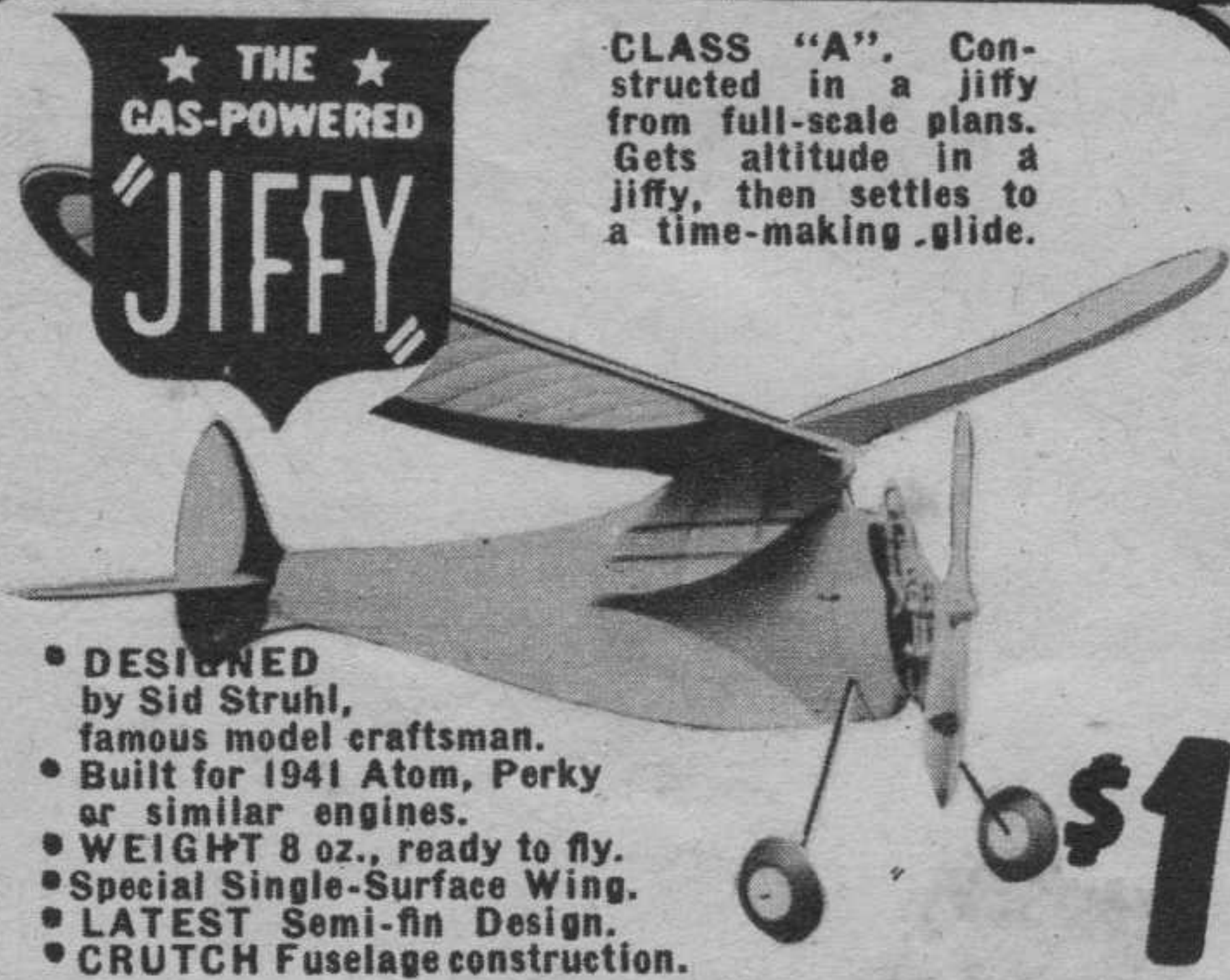
ORDER YOUR SET TODAY!

**ALL THREE**  
**For \$1.00 p.p.**

**3141 N. BROAD ST. M. B. SPOTTS PHILADELPHIA, PA.**

DISTRIBUTORS FOR EASTERN PENNA.

DEALERS: WRITE FOR SCHEDULES



- ★ THE ★  
**GAS-POWERED**  
**JIFFY**
- CLASS "A". Constructed in a jiffy from full-scale plans. Gets altitude in a jiffy, then settles to a time-making glide.
- DESIGNED by Sid Struhl, famous model craftsman.
- Built for 1941 Atom, Perky or similar engines.
- WEIGHT 8 oz., ready to fly.
- Special Single-Surface Wing.
- LATEST Semi-fin Design.
- CRUTCH Fuselage construction.

### STANDARD KIT

Liquids, Balsa wheels, Formed landing gear, Silkspan covering, & plenty of extras.

### DELUXE KIT

Stream-Lite wheels, Finished prop, Cement, Color & clear dopes, Silkspan covering, Formed landing gear.

**\$1**

Also DELUXE JIFFY \$150

## Stream-Lite

TRADE-MARK

A sensational development... ultra-streamlined sponge rubber wheel, centered with hardwood hubs... blow-out proof... fits all ships... available in 2 sizes:  
2½" Size for Any Class "C" (pr. 1.2 oz.)  
2" Size for Any Class "B" (pr. 2.3 oz.)  
Buy Stream-Lites—and avoid flats.

**PAIR - 40c**

**DEALERS**  
Jobbers - Distributors  
Write on letterhead for details on our complete line of kits & supplies—  
—from 10c to \$3.

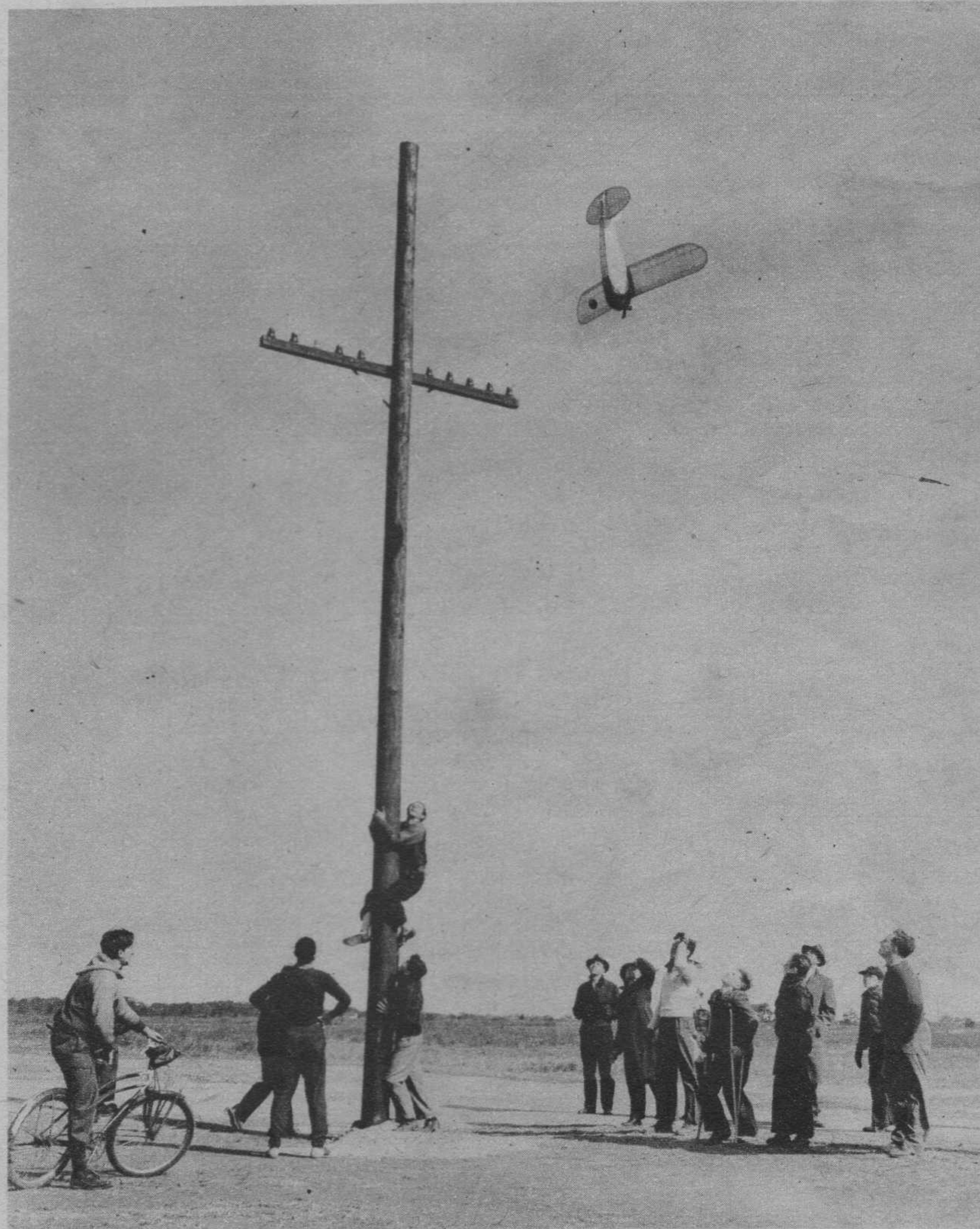
POSTPAID



**H & F MODEL AIRPLANE CO.**  
**273-A VAN SINDEREN AVE - BROOKLYN, N. Y.**

SEND FOR NEW CATALOG

**5c**



"Listen, Mabel, as I was saying—hello, hello—Operator! Operator!"



# RITZ GAS MODEL PROPS ARE STILL TOPS

Because more and more fellows are "Puttin' on the Ritz."

## RITZ

Quality, efficiency, and materials are the best obtainable. Only RITZ offers you such a wide selection of woods—Gumwood, bass wood, birch, mahogany, and walnut.

### CHAMPIONS

all over the world, in the U. S., in Canada, England, Portugal, New Zealand, insist on RITZ props as the most efficient partner for their power plant.

Sold at your model shop for only 15c, 25c, or 35c.

Put on a "BLITZ" by putting on a RITZ  
RITZ MFG. CO., 1100 S. California Ave., Chicago, Ill.

**REVOIL** More Power-Easier Starts  
Write for Circulars  
**CLUB DECALS** Your Design Brilliant Colors  
BEEBEPRODUCTS CO., Box 841, ROCKFORD, ILL.

**TESTOR CEMENT CO.**  
"The House of Adhesives"  
ROCKFORD, ILLINOIS  
WORLD'S LARGEST MANUFACTURERS OF MODEL AIRPLANE CEMENTS

**BRONX MODEL BUILDERS**  
Do you know that right in the Bronx  
**JACKSON'S MODEL & SUPPLIES**  
carries a complete line of—Motors, Gas and Rubber Model Kits, Boats, Race Cars, H-O Railroad, Balsa Wood and supplies?  
Also complete line of Archery Tackle (Send 10c for Archery catalog)  
We are equipped to do metal lathe work, Paint spraying and all types of wood cutting.  
FREE—I dz. handy size tubes of cement with each purchase of One Dollar or more—with this magazine clipping.  
For Consistent Values  
**JACKSON'S**  
3079 Third Ave. Near 157th St. Bronx, N. Y.

**Build World Famous WARSHIPS • RACE CARS AIRPLANES!**  
Complete Kits . . . No Extras to Buy!  
See Your Dealer!  
**AIRCRAFT COMPANY, CHICAGO**

**AMERICAN SUPERCRAFT SKY CHIEF**  
A Sensational, New Type, 2-cycle Airplane Motor. Designed for Maximum Operation in Airplane, Marine, and Racer Models. Block-tested and Absolutely Guaranteed to Run! Complete with Condenser and Coil.  
**\$6.95**

**BALSA WOOD CUT PIECES**

Prop. Blocks	Nose Blocks
1/2x3/4x5 . . . 2-1c	1x2x1 . . . 3-1c
1/2x3/4x6 . . . 2-1c	2x2x1 . . . 3-2c
3/4x1x7 . . . 1c	2x2x2 . . . 2-3c
3/4x1x8 . . . 1c	2x2x3 . . . 2-3c
3/4x1x10 . . . 2-3c	2x2x4 . . . 2-3c
3/4x1 1/2x10 . . . 2-3c	2x3x1 . . . 1c
1x1 1/2x18 . . . 2-3c	3x3x1 . . . 2-3c
1x1 1/2x12 . . . 2c	3x3x2 . . . 3c
3/4x1 1/2x10 . . . 2c	3x3x3 . . . 5c
1x1 1/2x10 . . . 2-3c	
1x1 1/2x12 . . . 3c	
1x1 1/2x15 . . . 4c	
1 1/2x1 1/2x10 . . . 5c	
1 1/2x1 1/2x15 . . . 6c	

Minimum Order, 30c. Postpaid  
**C. MEYER**  
Balsa Specialties  
Box 1151 Seaford, N. Y.

The California Championship meet, held May 3rd and 4th, was divided into two classes. The rubber-powered division was held May 3rd and results indicated that the weather was not too helpful in making good flights. Jim Morris won first in the senior outdoor fuselage ROG class with 2:28; second was Don Laustem with 1:57; while Perry Broz was third with 1:24. The open class was won by Bob Amos with 1:39; Gene Larson with 1:08 was second, and Charles Werle was third with :51. Junior class was won by Robert Ozowa with 1:14; second was Curt Holzhauser with 1:06, and Norman Busse was third with :48. The outdoor stick event, junior class, was won by Charles Dosset with 3:05. Senior stick was taken by Jim Katayma with 2:27; Robert Irwin was second with 2:04, and Stan Burns third with 1:39. The open stick event was won by Bob Amos with 2:01; Charles Werle was second with 1:02, and Dick Schumacker third with :47.

Bob Blau won the speed event, with Lester Elmore second and Bob Mueser third. Jim Morris won the flying scale event; M. Andrade was second, and Bob Mueser third.

The gas division of the championship meet was held on Sunday, May 3rd, despite a high wind which cut the times to a great extent. Clyde Holloway took the senior event, with Richard Chamberlain second and Frank Niblet third. Vernon Oldershaw won the open event, with Harry Waltz second and Donald Foote third.

The meet was sponsored by the San Francisco News and the San Francisco Exchange Club. Dr. Irving A. Dundas was meet chairman; Negley Monett was in charge of publicity, and Wesley Wooten handled arrangements.

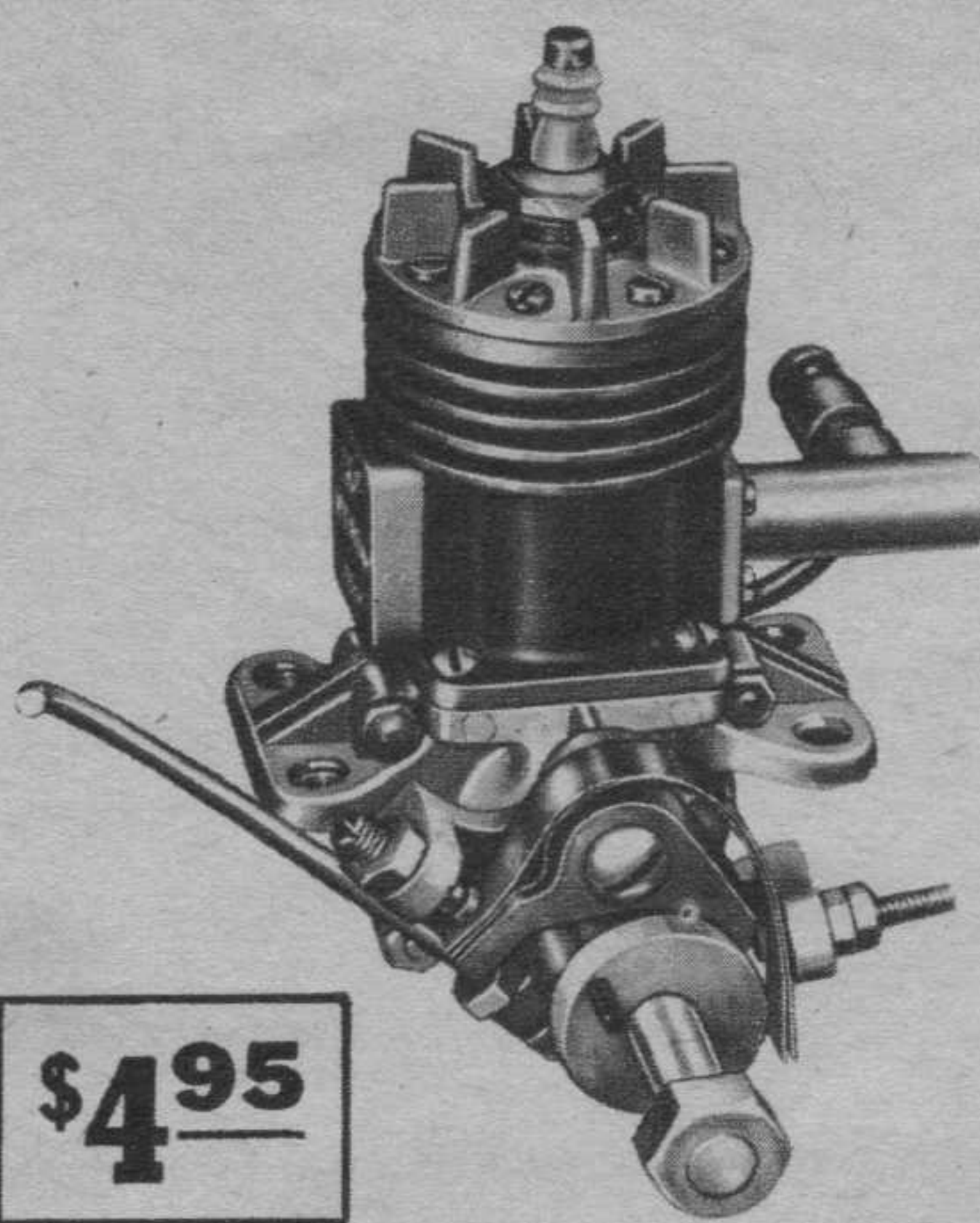
At last we have at hand a report of a contest which admits that "thermals abounded," and by looking at the times turned in at the second annual Superior California Gas Model Contest, held April 27th, we can vouch for the fact that the models did exceptionally well. Before the day ended four national records had been beaten. They were Class C, junior senior and open, and Class B open.

Donald K. Foote, of Oakland, flying a Class C ship, took first in the meet with the sensational time of 24:37. Carl Guidici was second with 14:40, also flying a Class C job. Don Lampson, of Lakeport, Cal., flying a Class B ship, took third with 14:14, and another entry of Don Foote's was fourth with 14:06. Jack Cudd was fifth. Other winners were W. H. Pittenger, Ralph Igler, Dick Pittenger, Gorden Peterson and Rob McCord. Gene Larson took Class A honors with 6:11.4. Ted Ravellette, AMA State director, directed the meet.

The sixth annual Southwestern Championship Gas Model Airplane Meet, sponsored by the Exchange Clubs of San Diego (Cal.) County, was held April 27th at Aëroneers' Field. The meet, one of the largest on the coast so far this year, attracted 366 entrants and more than 5,000 spectators.

Walter (Ross) Houck, of Ocean Beach, took first place with a time of 22:07 for two flights, the last being

# A REAL GASOLINE ENGINE \$4.95



**\$4.95**

Here is your opportunity to buy a kit of the famous G.H.Q. Gasoline Motor. **ABSOLUTELY COMPLETE — ALL MACHINING DONE — READY TO ASSEMBLE.** All you need is a screwdriver. No mechanical knowledge required.

Everything is in the kit including Champion spark plug, COIL, CONDENSER, tank and cap, ignition wire, cylinder, piston, connecting rod, timer, crankshaft, all screws, nuts, bolts, simple illustrated instructions, etc. Every part is fully machined and finished. A SCREWDRIVER IS THE ONLY TOOL YOU NEED.  
EXACTLY THE SAME PARTS THAT GO INTO THE G.H.Q. ASSEMBLED ENGINE.

The only nationally advertised \$4.95 kit that includes a coil, condenser and wires.  
**Identical Engine Less Coil and Condenser \$3.95**

## AN ENGINEERING TRIUMPH . . .

**Never Before at So Low a Price!!**

Indeed an engineering triumph—accomplished by outstanding G.H.Q. designers and engineers, who have constructed into the G.H.Q. motor everything that years of exhaustive scientific aerodynamic research could produce—geared to the highest possible degree of perfection. But more than that, the acid test . . . an overwhelming response. Thousands of users in all parts of the country are praising, recommending, and endorsing this scientific achievement. It seems as if everyone in America wants one. The most hair-raising thrill you've ever experienced will be yours with the G.H.Q. motor—actually one of the most powerful motors ever constructed. Has broken records for amazing performance.

### SPECIFICATIONS

4 Port 2 Stroke Cycle—3/4" Stroke—15/16" Bore—300-7,000 R.P.M.—Bearing Surface, 1 1/4" Long—Crankshaft, 5/16" Diam.—Invertible—Rotation, Either Direction—Height, 4 1/2"—Width, 2 1/2"—H.P. Approx. 1/5th. Class "C" under N.A.A. Rules.



Over 50,000 G.H.Q. Engines in Use Today  
Is Your Guarantee of a Good Investment!!

**EVERY PART FINISHED**

## 30 MINUTES TO ASSEMBLE • ALL PARTS WARRANTED

Imagine operating your own G.H.Q. 1/5 Horse Power gasoline engine—small enough to fit in the palm of your hand—yet turning up over 7,000 revolutions per minute and powerful enough to fly model airplanes of from 4 to 10 foot wingspan, and propel model boats from one to six feet in length and midget cars that travel over fifty miles an hour! There are also hundreds of other ways you can enjoy using this miniature yet powerful power plant—for small pumps, generators, compressors, blowers, fans, grinders and countless other experimental purposes.

Your G.H.Q. gasoline engine will be far more than just a toy for your spare moments. It is a scientifically constructed mechanical marvel that will thrill you with thousands of hours of pleasure. You will get a real kick out of controlling with your finger tip the surge of power your engine develops.

This engine has been tested and proven over the last eight years. Over fifty thousand of these powerful little G.H.Q. engines are now in actual daily use. Why not join the ranks of these hobbyists?

## ENGINE IS COMPLETE AND READY TO ASSEMBLE!

Your engine comes to you with every part completely finished. Our factory-trained skilled mechanics, using the latest automatic precision machinery, have finished each and every part to the last detail. You merely assemble the parts in accordance with the few simple instructions given, using only an ordinary screw driver, and inside of thirty minutes, your engine is ready to operate.

Not only will you and your friends have the thrill of seeing an engine ASSEMBLED BY YOURSELF operating, but you will gain a knowledge of gasoline engine theory and practice that will be of real practical value to you.

**FACTORY ASSEMBLED** **READY TO RUN** **\$6.50**  
— complete with coil and condenser —

## G. H. Q.'s Eighth Year! Read What Users Say:

J. B., Providence, R. I.—"A few weeks ago I received the G.H.Q. motor kit and it is running perfectly. I hope to write you soon and tell you about some excellent flights."

R. H., Prairie du Chien, Wis.—"Your motors sure can take a lot of abuse and knocking around and yet perform perfectly. I have had two in a period of about two years and have seen higher priced motors give less service and performance."

W. W. M., Russellville, Ark.—"I received my G.H.Q. Motor Kit and am very well pleased."

W. L., Claysburg, Penn.—"A wonderful motor that thrills any air-minded person. Strong and neat looking. As good as motors costing twice as much."

A. K., Hillside, N. J.—"I still can't understand

how you can put such a dependable and rugged engine on the market at such a low price."

E. T., Sayville, N. Y.—"Received my G.H.Q. Kit okay and am more than delighted with same. You've got 'em all beat for price and performance."

R. P., Hamburg, N. Y.—"I want to extend my personal thanks to G.H.Q. for their prompt service. The motor I ordered was received within 24 hours. Such service cannot be surpassed. I also want to say that I have the motor running perfectly. I shall do all I can to help promote the success of G.H.Q."

H. H., Midlothian, Ill.—"Motor assembled correctly and performs perfectly. I am fully satisfied."

C. C., Chicago, Ill.—"I received my motor and I am quite satisfied and surprised at the precision parts for the money."

## OVER 15,000 KITS SOLD IN THE LAST YEAR

**FREE** Send for free literature on G.H.Q. Gas Engine or send 6c for Jumbo Hobby Catalog and choice of free aviation or wings pin.

**HOW TO ORDER:** Send only \$1.00 We ship same day, Collect C.O.D. for balance

**G. H. Q. Motors, Inc., Dept. T, 40 East 21st St., New York, N. Y.**



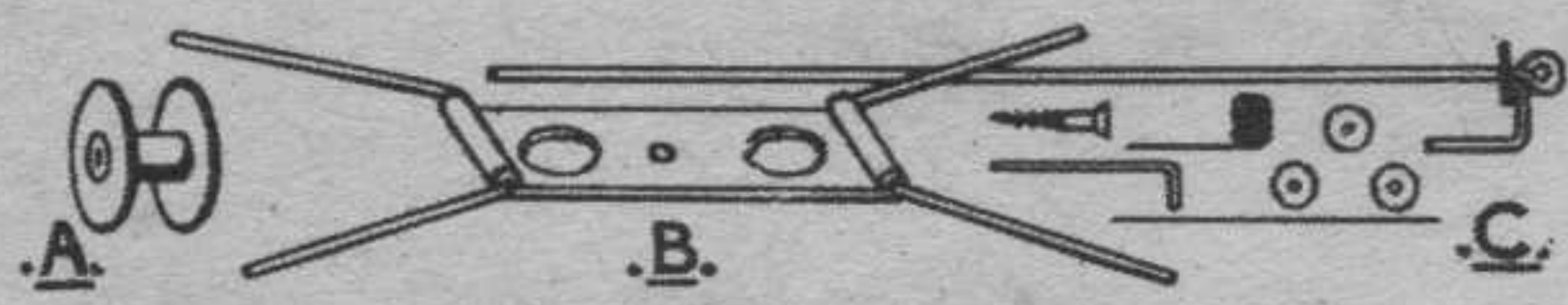
## "AIRFLOW 40"

HAND CARVED BALSA PROPS, PERFECT PITCH AND BLADE CONTOUR 12"-80c; 14"-90c; 15"-16"-1.00; 18"-1.10.

STREAMLINED BALSA WHEELS (MED. HARD) 1"-1 1/4"-1 1/2"-1 3/4" Diam. 3/8" Thick. 10c pr. 2"-2 1/4" 12c pr.

COLLAPSIBLE BOBBIN put on after shaft is bent to exact shape—adjustable—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", 1/4"x1 1/4", 3/8"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—1c per inch plus 8c Send 3c stamp for estimate on finished propeller and nose plug units.

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.)



WING SPAN 40"  
LENGTH 30"  
WEIGHT 6.14 Oz.  
RATE OF CLIMB  
1450 FT. PER MIN.

Finished—Wing Ribs and Spars, Saw Cut. Not Die Cut.  
Finished—Leading and Trailing Edges on Wing.

New—Balsa Shells, Tapered and Shaped. Finish off Nose of Ship, instead of Tricky Former Work. Easy to Cover. Absolutely Crash Proof.

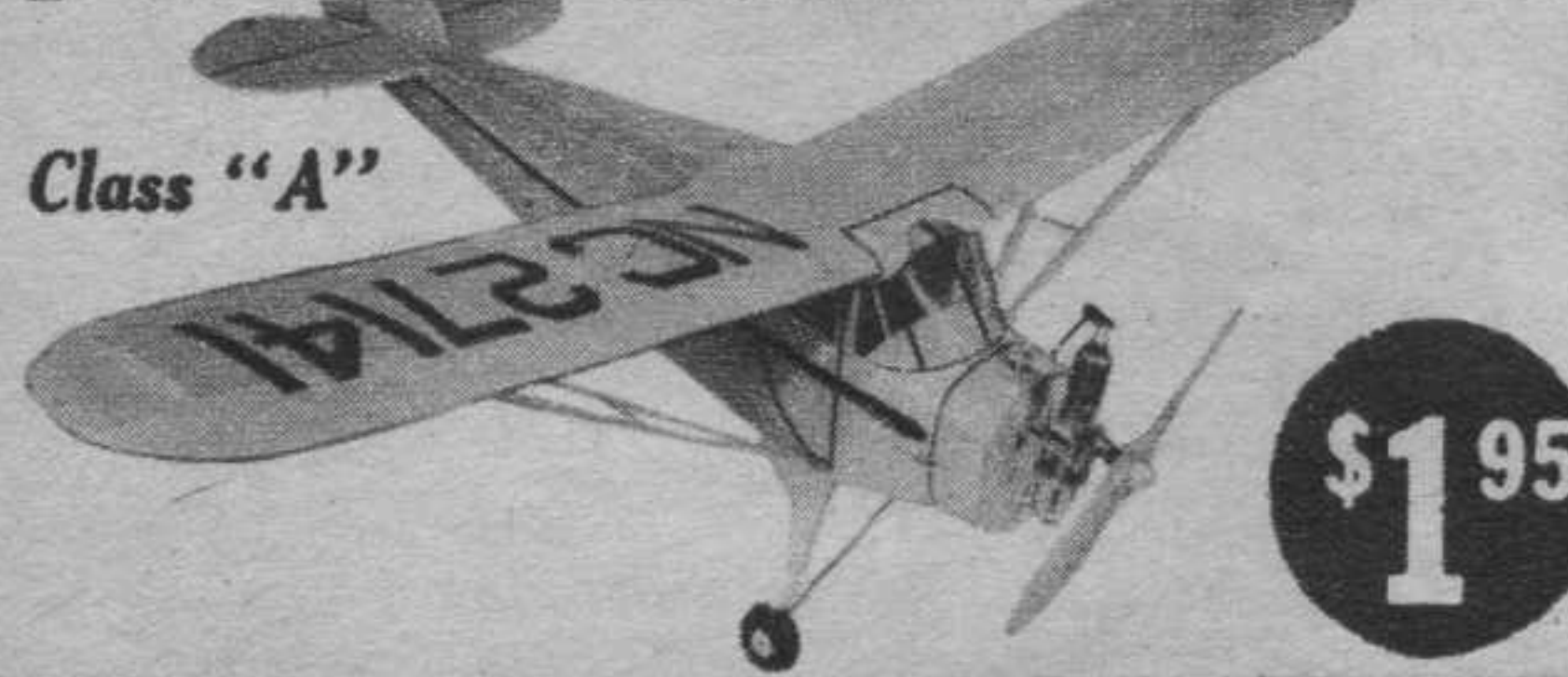
Giant Plan 35"x45". Formed Landing Gear. Ball Bearing Washer. Fresh Brown Contest Rubber. NOTHING ELSE TO BUY

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.

BEST BY TEST MODEL CO. 175A8 MAIN RIDGEFIELD PARK, N. J.

## PIPER CUB COUPE

Class "A"



\$1.95

CAPITOL AIRCRAFT  
1613-A E. N. Y. AVE. BROOKLYN, N. Y.

## MOTOR PARTS

Complete stock of Genuine Motor Parts for

BROWN, DENNY, OHLSSON, HERKIMER, ATOM, SYNCRO and ATWOOD CHAMPION

On hand at all times. Order that part today and put your motor in running shape

TROST MODEL SHOP

3111 W. 63rd St., Chicago, Ill.

New York's Largest Hobby Store  
NEW CATALOG JUST OUT!

Send 5c for your copy

Miniature Car Racing  
Every Tuesday 8:00 P. M.

TRYMO HOBBYCRAFT

85 CORTLANDT ST., NEW YORK, N. Y.

MODEL  
AIRPLANES  
RACE CARS  
RAILROADS  
MOTORS and  
SUPPLIES



WRITE FOR YOUR COPY NOW!

Easily the most complete, up-to-the-minute AIRPLANE and GAS ENGINE guide published. Profusely illustrated. Also: Equipment, parts, accessories. Visit or write for copy, 10c coin or stamps.

429 7th Ave. Between 33rd & 34th

(Open Thursday 'til 9 PM)  
Dept. AT-8 New York, N. Y.

## The "Flying Cloud"

# FREE

with one year's subscription to Air Trails

The Flying Cloud 44" wing span, 195 Square Inch wing area, contest endurance model for Wakefield and Moffett international competition.

1940 N. A. A. Gas Model Record Holder

1939 Indoor National Champion

1939 N. A. A. Gas Model Record Holder

The Flying Cloud includes these star features: • Propeller retracts flush against fuselage sides. • All propeller parts ready-made. • Rubber tensioner ready-made. • All wire parts ready formed, including landing gear, rubber hooks and tail skid.

### AIR TRAILS

79 Seventh Ave., New York, N. Y.

I am inclosing \$1.50. Kindly send me one FLYING CLOUD KIT and a year's subscription to AIR TRAILS. (This offer is open only to subscribers living in continental United States.)

Name.....

Address.....

City.....

State.....

\$7.95  
P.P.

## CLASS "B" CHAMP

COMPLETE OUTFIT—NOTHING ELSE TO BUY

\$7.95  
P.P.

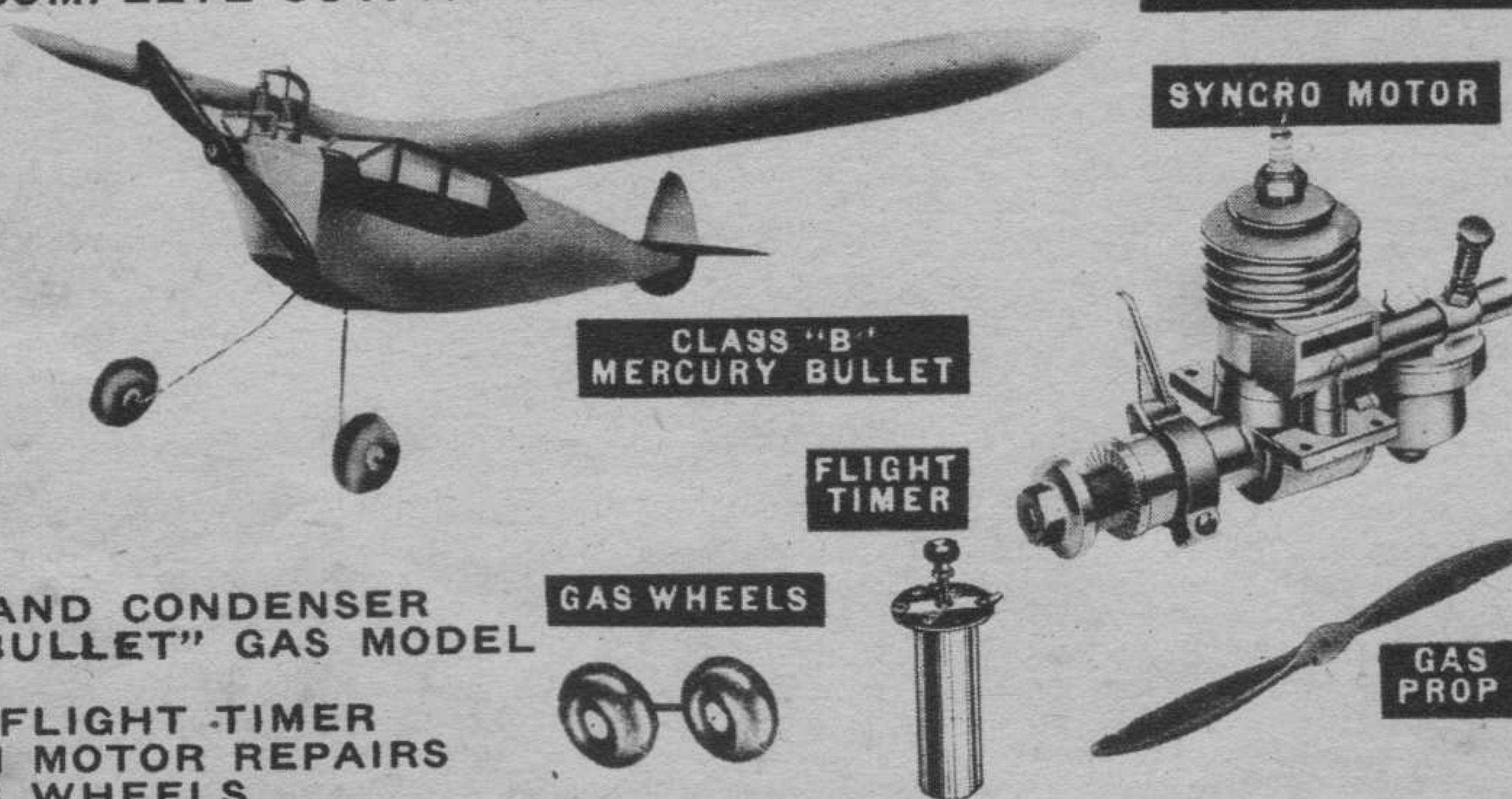
The lowest complete gas combination in model history. Both are complete including motor, model, timer, wheels, prop, etc. NOTHING ELSE TO BUY. — JUST BUILD AND FLY. \$7.95 complete.

- 1—SYNCRO 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. Cowed 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. 1592T8 LINCOLN PL. BROOKLYN, N. Y.



SYNCRO MOTOR

CLASS "B" MERCURY BULLET

FLIGHT TIMER

GAS WHEELS

GAS PROP

\$4.95 for motor alone.  
\$5.95 with coil and condenser.

out of sight. He received \$50 cash, the Consolidated Aircraft Trophy, the Southeastern Exchange Club AMA Trophy, the National City Exchange Club Class C Trophy and a Blue Ribbon.

Ray Acord, of Hollywood, was second with a time of 21:22, while Charles Koby of Van Nys, last year's winner, took third, doing 20:49. Bob White was fourth, Ray Budwig fifth. Ray, incidentally, took the Class B Trophy in the bargain, his time being 15:47. Bruce Main won the award for the best-looking ship and Miss Eva Wells won the award for the women's event. Holly Watrus won the Fireball event for the most spectacular performance.

Harold Strawn was contest manager and Rupert Ranger was contest director.

The San Diego Aëroneers, who were cosponsors of the event, presented an excellent meet and are to be congratulated on their fine handling of the affair. Charles Underhill is president of the Aëroneers. Bill Sweet is vice president and Mrs. Rae Davis is secretary. Treasurer is E. J. Brown; Franz Secrest, corresponding secretary; Harold Glinès, recorder.

An interesting item in the contest was the very comprehensive program which gave a list of entrants, the motors used, and ships. According to this list, almost every type of motor made was sported by contestants. Super Cyclones, Ohlssons and Bunch motors predominated, but others used included Hurleman, Brown, Torpedo, Denny, Atom, Forster, Madewell, Elf Twin, Brownie, the Willard, Bantam, Perky, Comet 35, Baby Cyclone, Sky Chief, Little Dynamite, O. K. and a Clark Special. 360 entries were listed.

Gotham Gas Gossip—The well-known Creedmore Flying Field is almost a thing of the past. A large hospital has been erected on the old field and power lines now intersect it. The new field is so near the houses that residents have called police to keep modelers from flying in that area. Instead, all flying (or most of it) has been transferred to Hicksville, L. I., a bit farther away, but a much better location. The site is just west of the famed Aviation Country Club, and the flat terrain enables modelers to retrieve ships quite easily. Only one fault—the thermals are terrific. For example, one recent Sunday, Sal Taibi lost a Tiger-powered Pacer with a 7:55 flight. Jerry Stoloff lost a Bantam-powered ship (called the Swami) after six minutes, and during the same day a Scientific Mercury with a Denny did almost ten minutes before disappearing.

Incidentally, the Sky-Scrapers Fall Contest (sponsored by AMA) will probably be held at Hicksville. The date has been set as August 31st.

New Yorkers bemoaning the lack of a flying field should drop a line to Arthur Hasselbach, care of Jackson's Model & Supplies, 3079 Third Avenue, Bronx, N. Y. There's a gas-model contest open to residents of Greater New York and New Jersey to be held opposite the Bronx-Whitestone Bridge, on July 20th.

**LET'S BE SCIENTIFIC.** (By James R. Custin.) During the past few years we have witnessed the growth of the bigger and better type of model airplane contest, with a list of prizes that makes "bank night" look like a piker's affair. Sponsors are thrown for a loss with every meet, and modelers lap up the cream with little thought to what they are giving in return.

Four or five days before a meet, the contestant rushes to the nearest hobby shop and buys the latest and most popular gas model kit. Then begins the twenty-four-hour-a-day grind of turning out the model in time for the contest. The house is upset, the family kept awake, electric bills go sky high, meals are late because the kitchen table is covered with balsa wood and cement, and everyone has a beautiful grouch. (How do you suppose I know all this?)

At last, on the morning of the meet, the modeler emerges with his creation—to give it its test flights. If he has done a sloppy job, he excuses this on the ground that it will stay up just as long as anybody else's—in a thermal. If he has turned out a very neat job he will probably regret the extra time spent when some crate that looks like a wreck hooks a riser and smashes all the records.

The average contest has degenerated to the level of a glorified bingo game. Most of the models are kit jobs, figured out by some genius who makes a profession of model airplane designs. It is no longer necessary to know even the most basic elements of aerodynamics in order to build a prize-winning contest model. The whole thing boils down to a question of who can adjust his model best and then hook the strongest riser with it.

Yet sponsors are inveigled into putting up cash for this sort of thing on the grounds that it stimulates a wider knowledge of the principles of aeronautics among youth, encourages the development of a scientific attitude, et cetera, et cetera. So does Chinese checkers.

It has always seemed to me that a contest ought to be a real test of aeronautical knowledge and skill. It ought to provide modelers with a chance to try, under actual competitive conditions, the ideas and theories which they have worked out in their models.

As one means of encouraging such a scientific attitude, I feel that an original design competition ought to be made a part of every major contest. The judging of such an event does present some difficulties, but these are not so great as to rule it out completely. Some sort of a scale can be evolved, with a little thought, which would make such judging less arbitrary than would seem necessary at first glance. I believe that the idea is worth considerable study.

More stringent loading and motor run rules, during the past few years, have tended somewhat to cut down the luck element in contests, but they have not eliminated the thermal current. Since it is almost impossible to select only cloudy days for model airplane meets, I suggest the night



contest as a possible solution to the problem.

A row of automobile headlights and a spotlight provide illumination for starting motors and making adjustments. Flying lights on the model make it easy to time and find. Both the model and motor must be carefully adjusted before the meet, since it's pretty hard to fumble with close adjustments in the dark.

While a night contest cannot so easily be made into an elaborate affair, with a couple of hundred contestants, thousands of spectators, and an impressive list of prizes, this is not entirely an evil. The contest is a model airplane meet, rather than a ballyhooed show, and contestants are forced to concentrate on the performance of their ships. Furthermore, night contests are real fun, as anyone who has ever attended one will testify.

But the burden of cleansing model aviation of the toy airplane attitude is not entirely on the sponsors and directors of contests. The aëro-modeler himself must adopt a scientific point of view with respect to his hobby if it is to be more than just a passing fad. He must realize that the model airplane is really a powerful means of aërodynamical research, and he must do something about it. "How am I going to do it?" you ask.

Well, it is obviously impossible for anyone to try to do experimental or research work on anything so complex as the model airplane considered as a whole. It is necessary, therefore, to select some particular problem or phase of model aërodynamics and concentrate on it. The model airplane is certainly not too small for specialization.

Following are some suggestions for research projects which can be carried out by any ambitious modeler.

Model airplane clubs looking for some activity to fill the nonflying months would do well to select one of these problems for group study. The idea is to choose one problem and stick to it until everything has been learned that there is to know about it.

**Stability.** In spite of the reams of paper that have been filled with discussions of spiral stability, no one really seems to know much about the subject. I can cite at least three theories purporting to explain the mechanism of the spiral dive, each of them very plausible, and each contradicting the others. And I have seen models built in strict accordance with each of these theories smash themselves to bits in vicious spiral dives.

The study of spiral stability is not a simple one, but the fellow who can come up with the right answer will really have accomplished something worth while. One method of attacking the problem might be the use of a pendulum attached to a movable rudder tab.

Even such a comparatively simple matter as longitudinal stability presents many problems for the model builder. We know, for example, that, other things being equal, a longer tail moment arm generally makes for more stability. But just what are

the limits of this effect? Suppose we used a seventy-percent tail moment arm? Or one hundred percent? The answer won't come by thinking about it. Someone has to try it. How about you?

And what about downthrust? Why does one model fly perfectly well without it and the other require a great deal in order to keep it from looping? Your guess is as good as mine, but we can't find the answer by guessing. It will take some honest experimental work to find out.

**Control.** Closely allied to the problem of stability is that of radio and remote control. Radio control presents an interesting and challenging problem to those who have the necessary knowledge and ability. The perfect radio control has not yet been invented. Even the army uses a telephone dial system which is far from the ideal cockpit-type control of which R. C. enthusiasts dream.

But even the simplest radio-control system can be of inestimable value in a study of stability problems. Nor is it necessary to use a radio signal for remote-control operation. A movable control surface can be actuated by the timer arm at a predetermined moment, or combinations of timers and controls can be used. The value of such apparatus in the study of stability is obvious.

**Airfoils.** The largest part of the performance of a model is determined by the wing planform and airfoil section used, yet modelers are notoriously careless about airfoils.

Too many model builders simply chop out a rib that looks like an airfoil, and then hope for the best. When asked what airfoil section they are using, they beam and brightly say that it is an "original design." Then if the ship works well, they praise the airfoil; if it works poorly, they don't know what's wrong.

The only way to determine the efficiency of an airfoil is to compare it directly with another. This means the construction of several wings for each ship, identical in all respects except airfoil. If the modeler thinks he has something unusual in the way of an original section, he can test it by direct comparison with other foils of known characteristics.

It is in this matter of airfoils that the kit model has an excellent place. A model built from a kit is usually dependable from the standpoint of stability and general performance, so that when different airfoils are tried on it the number of variables involved is reduced to the minimum.

**Motors.** The big problem here, of course, is how to get more power out of the present corn popper. And maybe some day some research genius will figure out why it always starts perfectly on the bench, but always balks just before an official flight.

But the field of motor research is not limited to the gasoline engine. Successful steam engines have already been built for models, and it is possible that with research and development they can become serious rivals of the gasoline motor. Diesel, compressed-air and rocket motors

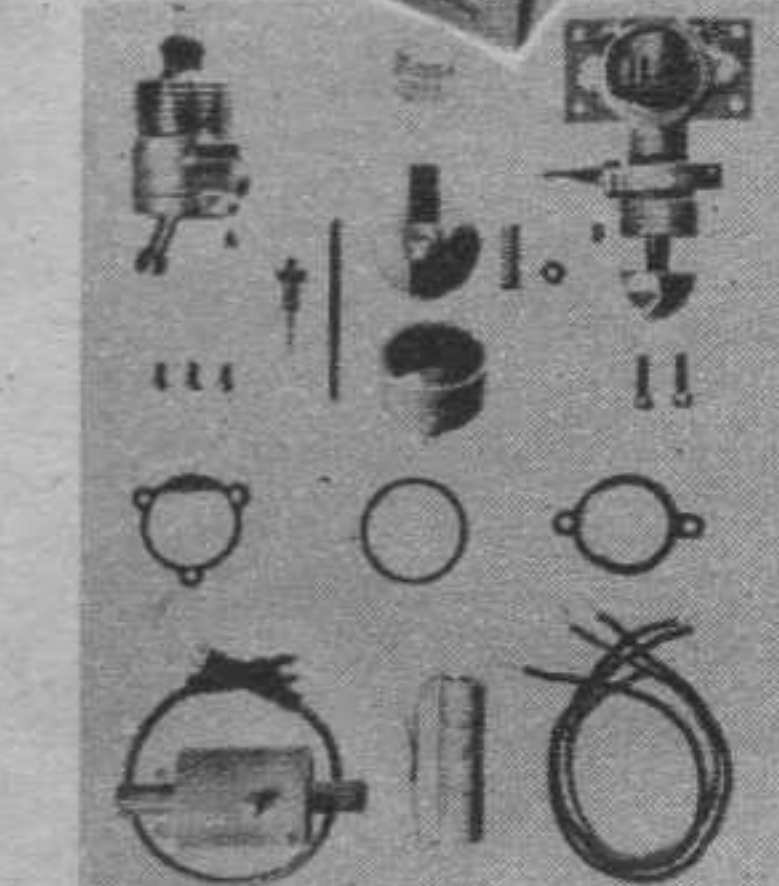


# ENTERS *Gas Model* FIELD..

and Rogers has designed the authorized engine

Air-Youth KD-29, complete with Coil and Condenser... **\$6<sup>95</sup>**

AIR Youth of America is a national non-profit organization, sponsored by leading educators and citizens for the purpose of encouraging the aviation skill and knowledge of the youth of America. Model plane activities are used in a training program related to full scale aviation. To the Air Youth basic models, is now added a gas powered model... and Rogers has been authorized to produce the motor... AIR YOUTH KD-29, a knock-down construction kit.



## Rogers "KD-29"

Precision engineered. Easily assembled. MATCH-FITTED with Unit Replacement Parts. Basic units can be returned for immediate replacement at small standard cost. New, perfected commutator, brush-type timer, super-charged carburetion; will not flood. Bore 13/16. Stroke 9/16. Displ. .292. Wt., 4 3/4 oz. Class B.

**\$4<sup>95</sup>** Incl. Spark Plug

Designed and built with the same skill that has made Rogers KD-29 an outstanding sensation in miniature motors, the Air Youth KD-29 includes a specially selected coil and condenser. Ask your dealer about it, or write direct to us.

CLIFFORD WILLIAMS  
**Rogers**

Hedge & Gillingham Sts.,  
Philadelphia, Pa.

**FLASH!**  
The 1941 MIKE  
is just out!

**BIGGER, BETTER, THAN EVER BEFORE**



**ONLY \$1.49**  
Postpaid

The modified version of the famous Bay Ridge MIKE, has just been released. The new ship is modernized in every respect, and super-detail plans make it easier to build, and a greater performer in every way. At this sensational price you get a proven champ among small motor ships.

The MIKE is ideally suited for all motors from .15 to .27 cubic inch displacement. Has won hundreds of high contest places including many firsts in Classes A and B. Complete kit contains printed sheets, hi-quality wood, landing gear wire, fittings, Silkspan for covering, and many extras. STREAM-LITE rubber wheels, 40c per pair extra. Order your MIKE today.

**BAY RIDGE MODEL AIRPLANE & SUPPLY CO.**  
4410 3rd Ave. Dept. A9 Brooklyn, N. Y.

## CZ METAL COVERED MODELS

**KEEP IN STEP WITH MODERN AVIATION**  
It is easy and fascinating to build real planes in miniature with sheet aluminum covering. Your finished job will be a masterpiece with a beautiful lustrous finish that you will be proud of. The kits are complete with everything necessary to make a finished model, with the exception of liquids. The photographs will give you an idea of how the finished models will look.



ACTUAL PHOTO OF SPARTAN EXECUTIVE MODEL

SELECTION OF NINE MODELS			
21" Boeing Stratoliner... \$4.00 P.P.	13 1/2" Curtiss Hawk 75A... \$2.00	9 1/2" Grumman F4F-3... \$ .75	
13 3/4" Republic Guardsman 2.50	12 1/2" Spartan Executive... 1.50	10" Bell P39 Pursuit... .75	
13 1/2" Vultee Vanguard 48A 2.00	12" Consolidated PB2A... 1.00	9" Northrop A17A... .50	

Prices subject to change without notice. SEND 3c FOR DESCRIPTIVE ILLUSTRATED FOLDERS

The kits for the above planes contain balsa parts cut to outline shape, die-cast propellers, rubber military type wheels, aluminum tubing for landing gear, the finest detailed plans available, and most important are the ALUMINUM sections. These aluminum sections are complete, even to reproducing the rivets in the actual plane.

Be the first in your locality to build the world's finest scale models. CZ metal covered model airplanes are built by better model builders and sold by leading dealers everywhere.

Ordering Instructions: Include 15 cents postage with \$1.00 & up kits, and 10 cents with other kits. No C. O. D.s., no stamps. Cash at your own risk. If your dealer can't supply you, send direct.

DEALERS: Your customers will be asking for these kits. Write today for prices on your letterhead. Be prepared for the demand.

**CZ MODEL AIRPLANE CO.** Dept. AT8 3656 W. 65th ST., CHICAGO, ILL.



# Never a Dull Moment All Summer Long With These Easily-built, Beautifully-performing CLEVELAND MODELS



## Huge 7-foot Span CLEVELAND CONDOR

Queen of the Air in Soaring and Gliding. Class E (or D). Wing area of 324 sq. in. Graceful as a swallow. Complete Kit No. E-5019, only. **\$1.00**

## 48" CLEVELAND EAGLET

Baby Bowler design. Class D. Pod-shaped fuselage and cylindrical tail boom gives it unusual soaring, gliding qualities. Complete Kit No. E-5018, only. **50c**  
(Add 15c to orders less than \$1.00)

## New 3/4" Scale WARPLANES

AIRACOBRA (shown). Span 25 1/2". Complete Kit SF-76 **\$2.50**

SKYROCKET. Span 31 1/2". Complete Kit SF-75 **\$3.00**

SPITFIRE. Span 27 1/2". Complete Kit SF-73 **\$2.50**

MESSERSCHMITT ME-109. Span 24 1/2". Complete Kit SF-74 **\$2.50**

SUPERMARINE S.E.B. for Water Sport  
Span 22". Complete Kit SF-19 **\$1.75**  
Span 14 1/2". Compl. Kit D-19 **.65c**

## Get in the Gas Meet "Money" with these "Supercharged" CLEVELAND PLAYBOYS

PLAYBOY SR. Class C. Span 80". Broke World's Record twice in one week! A regular winner because of its zippy climb. Kit GP-5017 (complete except power unit) **\$3.95**

PLAYBOY JR. Class B. Span 54 1/2". Build it, and be the "dark horse" in every meet. Kit GP-5006 (c. e. p. u.) **\$2.50**

BABY PLAYBOY. Class A. Span 33". Biggest gas value on market. Kit GP-5008 (c. e. p. u.) **\$1.00**

**Send For New Big Catalog**  
Airplane Catalog features all the famous Cleveland authentic scale models (including the 4 new war models), contest models, gas models, Nature models, gliders, etc., etc., for indoor and outdoor flying. Prices from 25c up. Send for your copy **5c** NOW. It's only.

## CLEVELAND MODEL & SUPPLY COMPANY, INC.

"America's FIRST LINE of Models"

4508A71 Lorain Avenue,

Cleveland, Ohio, U. S. A.

## LEADING SUPPLY HOUSE

**FREE POSTAGE** in U. S. on all orders for 1 dollar or over add 10c West of Miss. No stamps. No C.O.D.'s.

**FREE** choice of any one on orders of 1 dollar or over. (1) water sprayer. (2) 3 plans. (3) 5 sheets AA tissue. (4) large cement or dope.

<p><b>18" Balsa</b> 1/16x1/16 100, 5c 1/16x1/8 40, 5c 1/16x3/16 18, 5c 1/16x1/2 15, 5c 3/32x3/32 35, 5c 1/4x1/4 32, 5c 1/4x1/2 10, 5c 3/16x3/16 8, 5c 1/4x1/4 6, 5c 1/4x1/2 2, 5c 1/4x3/4 6, 10c 1/2x1/2 10, 10c 1/2x3/4 9, 10c 3/32x2 8, 10c 1/4x2 7, 10c 3" or 36" double above prices; 5 foot, double 36" prices. Add 10c pkge. for 36" 20c for 5-foot.</p> <p><b>M&amp;M WHEELS</b> 1 1/2 to 1 1/8 .50c 1 1/2 to 2 .60c 2 1/2 Gas .90c 3" Gas .1.00</p>	<p><b>SHEETS 12"x2"</b> 1/16x1/32 11, 10c 1/8 . . . . .8, 10c 1/4 . . . . .3, 7c</p> <p><b>18" PLANKS</b> 1x1 5c; 1/2x2 6c 1x1 1/2 9c; 1x2 10c 1x3 15c; 2x2 18c</p> <p><b>WIRE</b> 6-8-10-12-14 2 ft. . . . .1c 1/16 dia. 5 ft. 12c 1/8 . . . . .3 ft. 5c 3/32 dia. 5 ft. 15c 1/4 dia. 5 ft. 25c</p> <p><b>PROP SHAFTS</b> 12 for . . . . .8c</p> <p><b>REAR HOOKS</b> 12 for . . . . .8c</p> <p><b>PROPS</b> HINGES .10c BRUSHES Small 3c; Lge. 5c Extra large .8c Flat, large .10c</p> <p><b>TISSUE, AA</b> All col., doz. 18c Silver . . . . .5c Superfine, wh. 5c</p>	<p><b>PROP BLOCKS</b> 1/2x1/2x6 . . . . .6, 5c 1/2x1/2x8 . . . . .3, 5c 1/2x1/2x10 . . . . .3c ea. 1/2x1/2x12 . . . . .3c ea. 1x1 1/2x12 . . . . .4c ea. 1x1 1/2x15 . . . . .7c ea.</p> <p><b>RUBBER LUBE</b> Bot. or Can 10c</p> <p><b>WHEELS per pr.</b> Brch Balsa Celu 1/2 . . . . .01 .03 3/4 . . . . .02 .04 .05 1 . . . . .03 .05 .07 1 1/2 . . . . .04 .08 .10 1 3/4 . . . . .07 .10 .16 3 . . . . .15 .15 .30</p> <p><b>CEMENT and COL. or CLEAR DOPE</b> 1 oz. . . . .5c Large bot. . . . .8c 1/2 pt. . . . .35c NOSE BLOCKS 1x2x1 . . . . .1c 2x2x1 . . . . .2c 3x3x1 . . . . .5c 3x3x2 . . . . .8c 3x3x3 . . . . .10c</p>	<p><b>PROPELLERS</b> Balsa Paulo Gas Wina Mod. 5" 4c-7c Pol. 6" 5c-9c-8" 25c 7" 6c-12c-9" 25c 8" 7c-15c-10" 25c 9" 8c-19c-11" 25c 10" 9c-23c-12" 25c 12" 10c-28c-13" 25c 14" 12c-35c-14" 25c</p> <p><b>IGN. WIRE</b> (Hi tens) . . . . .ft. 5c Hookup . . . . .2c Spinners . . . . .20c</p> <p><b>WASHERS</b> 1 doz. 1/4 or 1/2 1c Ball Bearing 10c Bushings 4 for 1c</p> <p><b>NOSE PLUGS</b> 1/2" . . . . .6 for 3c</p> <p><b>CELLULOID</b> 6x8 . . . . .5c</p> <p><b>BAMBOO PAPER</b> White, red, green, blue or yellow . . . . .5c</p>	<p><b>SPONGE RUBBER WHEELS</b> 1" pair . . . . .15c 1 1/4" pair . . . . .18c</p> <p><b>MODEL PINS</b> 1/2" or 1" pkge., 5c</p> <p><b>RUBBER</b> 1/16 sq. 20 ft., 5c 1/8 flat 15 ft., 5c 3/16 . . . . .10 ft., 5c 1/2 Tubing ft., 5c</p> <p><b>REED</b> 1/32-1/16 . . . . .2, 1c 3/32 or 1/4 1 ft. 1c Silk . . . . .yd. 45c Austin Timer 1.00 Clock Timer 1.75 Smith Coll 2.50 Model Knife 10c 3 extra blades 10c Fly wheels 1.00 Spark Plugs 50c Alligator clips 5c Plugs and Jacks 5c Set . . . . .20c Condensers . . . . .10c</p>	<p><b>15" BAMBOO</b> 1/16x1/4 6 for 5c Shredded 36 for 5c</p> <p><b>THRUST BEARINGS, dz.</b> Sm. 10c; lge. 15c</p> <p><b>CLEAR DOPE</b> 1/2 pt. . . . .30c</p> <p><b>INSIGNIA</b> 24 and stripes 5c Water Sprayer 10c Sandpaper 12, 5c</p> <p><b>ALUM. TUBING</b> 1/16, 3/32, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, 5 1/2, 6, 6 1/2, 7, 7 1/2, 8, 8 1/2, 9, 9 1/2, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100</p> <p><b>SHEET ALUM.</b> .0004, 4"x36" . . . . .3c .005 in. 6x6 . . . . .5c .010 in. 6x6 . . . . .6c 1/32 . . . . .6x6 . . . . .15c 1/16 . . . . .6x6 . . . . .30c</p> <p><b>PLASTIC Balsa</b> Large can . . . . .15c</p> <p><b>ENGINE OR COWL CEL.</b> 1 1/4" d. . . . .15c 2" d. 20c; 3" d. 25c</p>
---	---	---	--	---	---

COMPLETE 16-page CATALOG 5c. Dealers: Send 3c for Wholesale Price List.

## IMPERIAL MODEL SUPPLY CO., DEPT. A8, HACKENSACK, N. J.

## the PIONEER BROWN ENGINE KIT

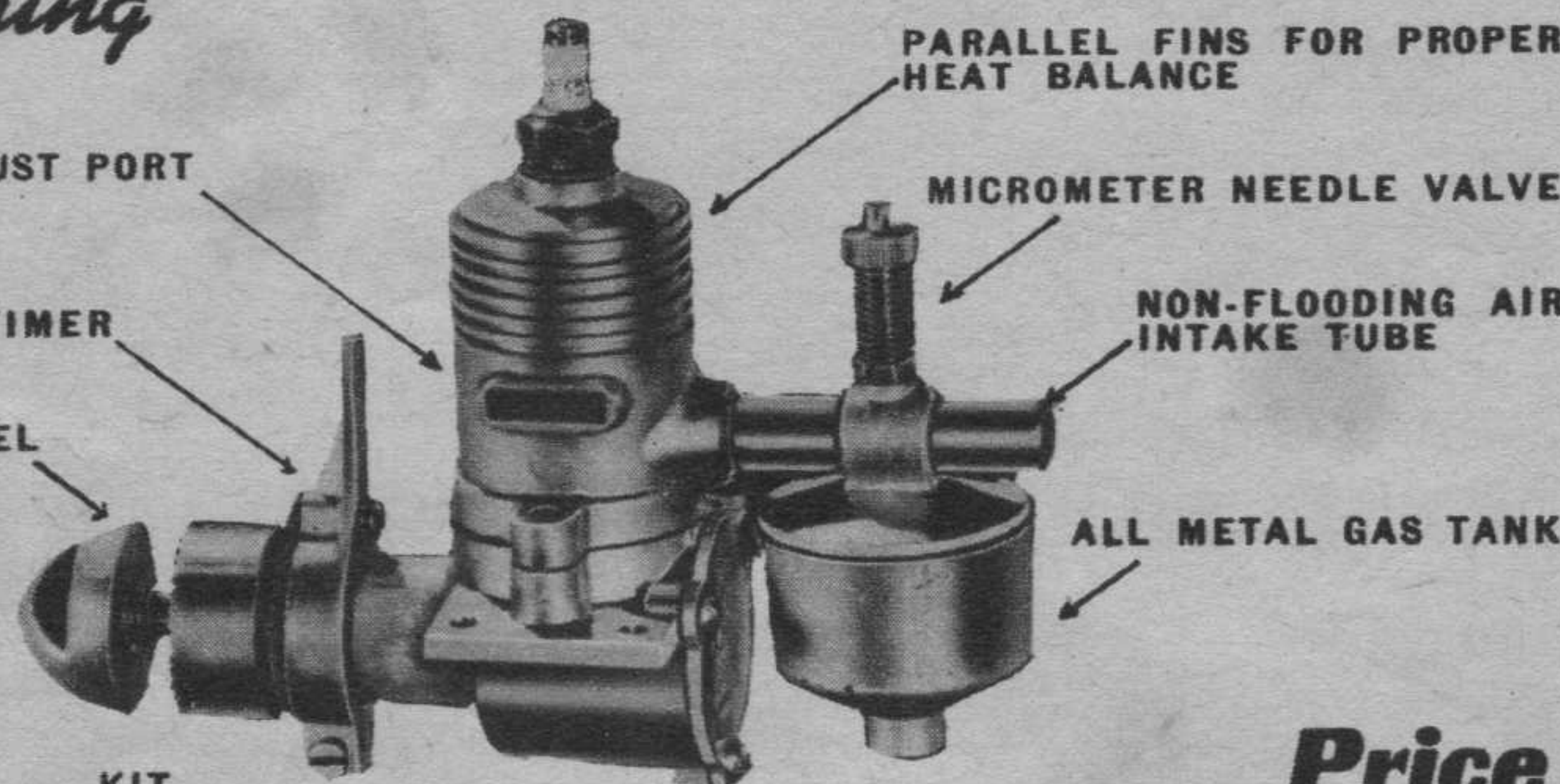
featuring

WIDE ORIFICE EXHAUST PORT

COMMUTATOR TYPE TIMER

SPECIAL ALLOY STEEL CRANKSHAFT

Delivering top performance in class "B", the PIONEER BROWN PB-292-K brings you a high quality engine in economical kit form. Order yours today! Bore . . . . .1 1/8" Stroke . . . . .9/16" Displacement . . . . .292" Weight . . . . .4 3/4 oz.



KIT ASSEMBLED

Anyone can put this engine together in a few minutes, start and operate it satisfactorily as all the moving and rotating parts are machined and carefully fitted at the factory. Guaranteed as to design, workmanship and material.

**Price \$4.95**

A Product of **WILLIAM L. BROWN, 3rd**  
6636 NO. TENTH ST. PHILADELPHIA, PA.

also present interesting fields for thought and experiment.

And the rubber motor is not to be neglected. Running torque and horsepower curves on rubber motors of various sizes and kinds is an excellent and very useful exercise in applied physics. If you're interested in chemistry, you might figure out the perfect rubber lubricant. The possibilities in the field of rubber motors are virtually inexhaustible.

Right here, by the way, is a good place to say a few kind words in behalf of the rubber-powered model. There are now only a very few hardy souls who still fly rubber-powered ships year after year, just for the fun of it. Yet the rubber model is far superior to the gas-powered ship for experimental purposes, since it can be built much more quickly and cheaply.

The rubber model, moreover, presents a real challenge in the matter of design and adjustment, because its power run varies over such a wide and continuously changing range. All too many young modelers are starting out by building gas models, often with disastrous results. More experienced fliers should point out to them the importance of starting with rubber-powered craft.

**Propellers.** Mere mention of the name should suggest a host of problems. One suggestion for particular study might be this: Does the propeller which delivers the greatest amount of static thrust necessarily deliver the greatest amount of power in actual flight?

**Structure.** Structural design is still a wide-open field. Geodetic and monocoque construction present possibilities for experiment, as do papier-mâché and various other plastics. Light weight, strength and simplicity of construction are the goals to aim for.

**Unorthodox Types of Aircraft.** Recently there has been considerable interest in model helicopters, and several successful and promising designs have already been evolved. The small number of modelers working with helicopters makes this an excellent field for further work by the fellow who likes to lead the way.

Very few model autogiros have been made to work successfully, yet the model autogiro may possess some advantages over the fixed-wing airplane. The same is true of ornithopters.

Canards, seaplanes and amphibians present other possibilities for experiment for the fellow who has a spare gas motor and a little ingenuity.

**Gadgets.** There are still a host of gadgets which must be perfected. How about a really effective two-wheeled retractable landing gear? Or a good folding or freewheeling prop for gas models? Or a gadget to drive coaxial gas props in opposite directions, thereby eliminating torque problems? Or automatic wing flaps? Or slots? Or—shades of Buck Rogers—retractable wings that permit sky-rocket climb and unfold to produce that floating glide?

**Measuring Devices.** The essence of science is measurement. Yet, after the construction stage, the only measurement that takes place on the average model is timing the motor run and flight.

No one has yet invented an altimeter suitable for models, yet think of the advantages of such an instrument. And how about a practical airspeed indicator that will make a continuous record of airspeed at each stage of flight?

Some amateur psychologist might make a study of human errors in the timing of motor runs, and devise a means of remedying them. We know that one timer will clock a motor run at nineteen seconds while another may call it twenty-one. What's the answer?

No matter which of these problems you decide to work on, certain precautions must be observed.

A scientific approach demands careful planning and building. It requires constant checking and measurement. One successful flight proves nothing. Six successful flights prove very little. Fifty consecutive successful flights prove the point convincingly.

The scientist starts with a problem, and possibly with a tentative solution. Then he devises a means of attack—the experiments which he will perform. He sets up his apparatus carefully, checks every step to see that no disturbing factors enter the picture, and works patiently. If there is a possibility of error, he repeats the experiment, taking averages if necessary.

When he has finished, he may find that his tentative solution or "hypothesis" was correct. Or he may find that it was all wrong, and then he has to start out on some other track. But he never quits until he gets the right answer.

That ought to be the spirit in which the aëromodeler works. That is, in fact, the way the successful modelers work—the ones who win contests consistently, risers or no risers.

So—let's be scientific.

If you like

# SEAPLANE MODELS

Don't miss the next issue



# JUST OUT

# THE Model Plane ANNUAL

## 1941



Edited by Frederick P. Graham  
and Reginald M. Cleveland

The latest developments in  
your hobby presented in  
text and over 200 pictures



**CONTENTS**  
POWERED FLIGHT HISTORY DESIGN ODD AND UNUSUAL MATERIALS  
ENGINES SEAPLANE MODELS INDOOR FLYING MEETS SCALE MODELS RULES

With a Foreword by Robert A. Hinkley,  
Assistant Secretary of Commerce

The Model Plane Annual: 1941 presents a consecutive account of every phase of this fascinating hobby. The various types of model planes which have been both manufactured and privately built during the past decade are shown in construction and in flight. The detailed steps in present-day construction are then described by means of photographs and drawings as well as in text. The high points of the important meets are analyzed in a chapter which is perhaps the most valuable of the entire book. In ensuing chapters engines and other technological aspects of model plane operation are fully described. The final chapter contains the complete N.A.A. contest rules and specifications.

For the hobbyist, the aeronautical student and the aviator The Model Plane Annual: 1941 will provide valuable information and will contribute immeasurably to the fun of building and flying model planes. The editors are present and past aviation editors of the New York Times. \$2.00

ROBERT M. McBRIDE & CO.  
116 East 16th St., N. Y.

## Mulvihill Trophy Winner

(Continued from page 49)

symmetrical cross section tip. Then shape the blade, sanding it well, following with four coats of clear dope, sanding lightly between each coat and finally rubbing it well with rubbing compound so as to obtain a smooth, glossy finish. Care should be taken to obtain a perfectly balanced prop so as to obtain good flights consistently. Refer to plans for prop assembly and tensioner.

The model is covered with regular Jap tissue. Use dope to apply paper and always run the grain of the paper the long way in order to eliminate excessive sagging. Cover the total under surface of the wing first, sticking the paper directly to the underside of each rib in order to obtain the best airfoil, then cover the top of the wing. Spray the entire model with water, and paint the wing and tail assembly with one coat of clear dope and the fuselage itself with two coats.

The tail assembly is then cemented directly to the tail boom; the rudder's trailing edge being offset approximately  $1/16$ " to give a right circle.

A motor consisting of 18 strands of  $3/16$ " flat rubber with about six inches of slack is used, and is held in place in the rear by  $1/4$ " hardwood dowel rod.

### FLYING

The model should be tested in the evening when there is very little wind. A  $1/8$ " incidence block should be slid under the leading edge of the wing and can always be changed if necessary. Make several test glides. If the model stalls during these glides, move the wing back a bit; if it dives, move the wing forward. The angle of incidence can always be changed by slipping different-size pieces of balsa under the trailing or leading edges as the case may be. After a flat glide is obtained, wind the motor about 150 turns and launch into the wind. It should turn to the right and spiral upward. Adjust for turn by giving it more or less right thrust. Correct stall with downthrust. Adjust carefully each time the number of turns is increased. The model flies opposite torque, both under power and in the glide.

### "Why Slots?"

(Continued from page 50)

sharply at the stall point—about 15 degrees.

The slotted wing lift curve does not rise as swiftly, or with a linear variation, but at an angle of attack of 20 degrees the lift is still increasing. This means that there is much less tendency for the model to reach a critical stall point, where it will violently "whip out," with subsequent loss of valuable altitude.

As the stall is approached, the lift decreases gradually and the model "mushes" slowly out of the near-stall. Obviously the adjustment of such a model would be greatly simplified, as the model will fly within a greater range of actual surface settings without disastrous results. Even after the initial adjustment period certain variations in standard conditions could be detected and corrected before any serious damage occurred.

But for this extra dependability we must pay a price—namely, increased drag. The increased drag is very slight at low angles of attack, but rises somewhat as the angle of attack increases. This increased drag, combined with the somewhat flatter lift curve, gives a lower maximum value of L/D for the wing, to which the glide is more or less directly related. (Fuselage, strut and tail drag also affect total drag.) In other words, a perfectly adjusted model which never gets into trouble is better off without slots, but models in general being what they are, any such device which so increases the dependability of the model is highly

desirable. How many times have we seen ships turn in one super flight to, shall we say, three or four poor ones—with no apparent change in adjustment?

The usual location of the slot is just at the rear of the leading edge. The section tested was of this type.

This arrangement gives the maximum increase of lift at high angles. The increase of maximum lift diminishes as the slot moves toward the trailing edge, but there is also a decrease in the extra drag caused by the slot. All in all, however, the speed of model aircraft is low enough so that the lift considerations outweigh those of drag, and the slot should be placed near the leading edge. It should be tapered from bottom to top, and all the corners well rounded to minimize drag. The walls of the slot should form a mean angle of about 45 degrees to the chord line.

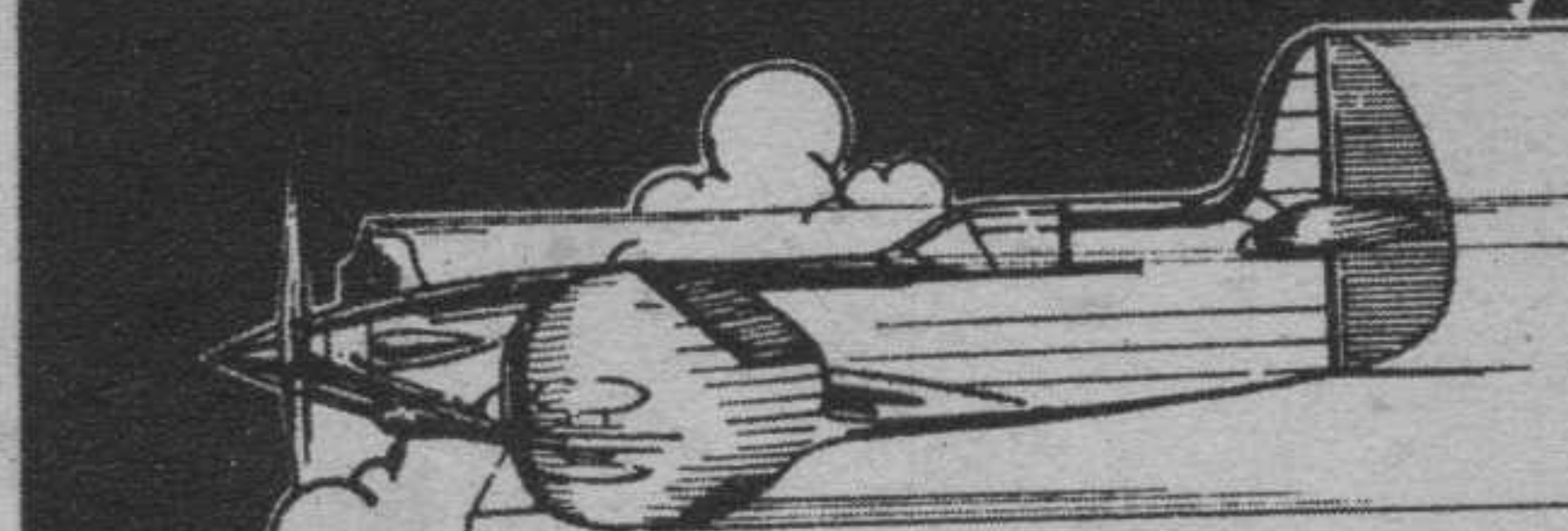
The single slot in the leading edge is by no means the only means for accomplishing what has just been set forth. Slots which are carried forward and above the wing proper, multislot wings, all do the same thing. It was thought, however, that the structural fragility of these systems would render them too impractical for small aircraft usage.

So, you fellows with an experimental bend, let's try something different. Put some slots in your wings, and check your performance both with and without slots. If you run into difficulties drop us a line, and we will try to answer your questions.

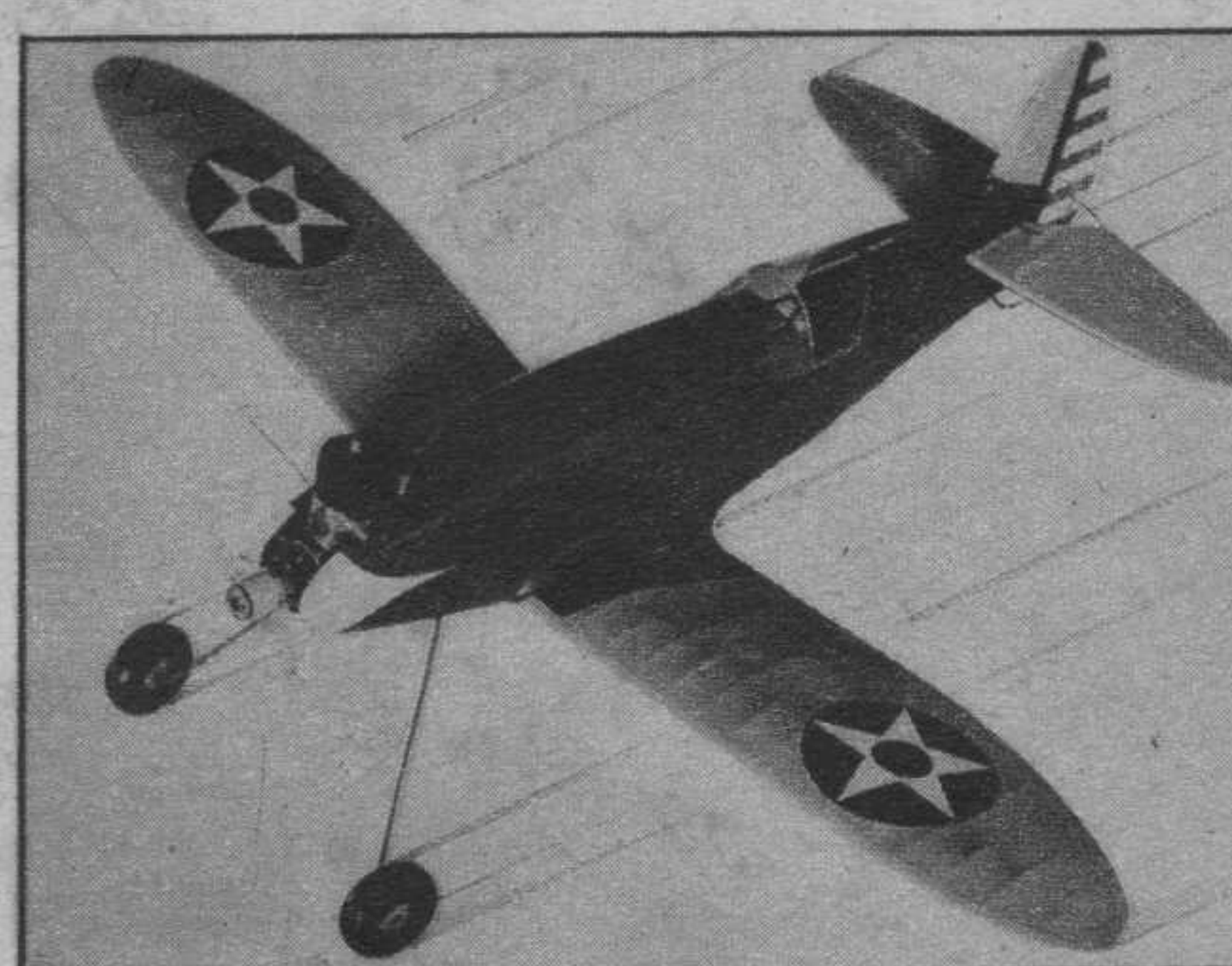
In the next issue—a new stick model by  
**DICK KORDA**

## "G" LINE FLYING

Sensational - New - Thrilling



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



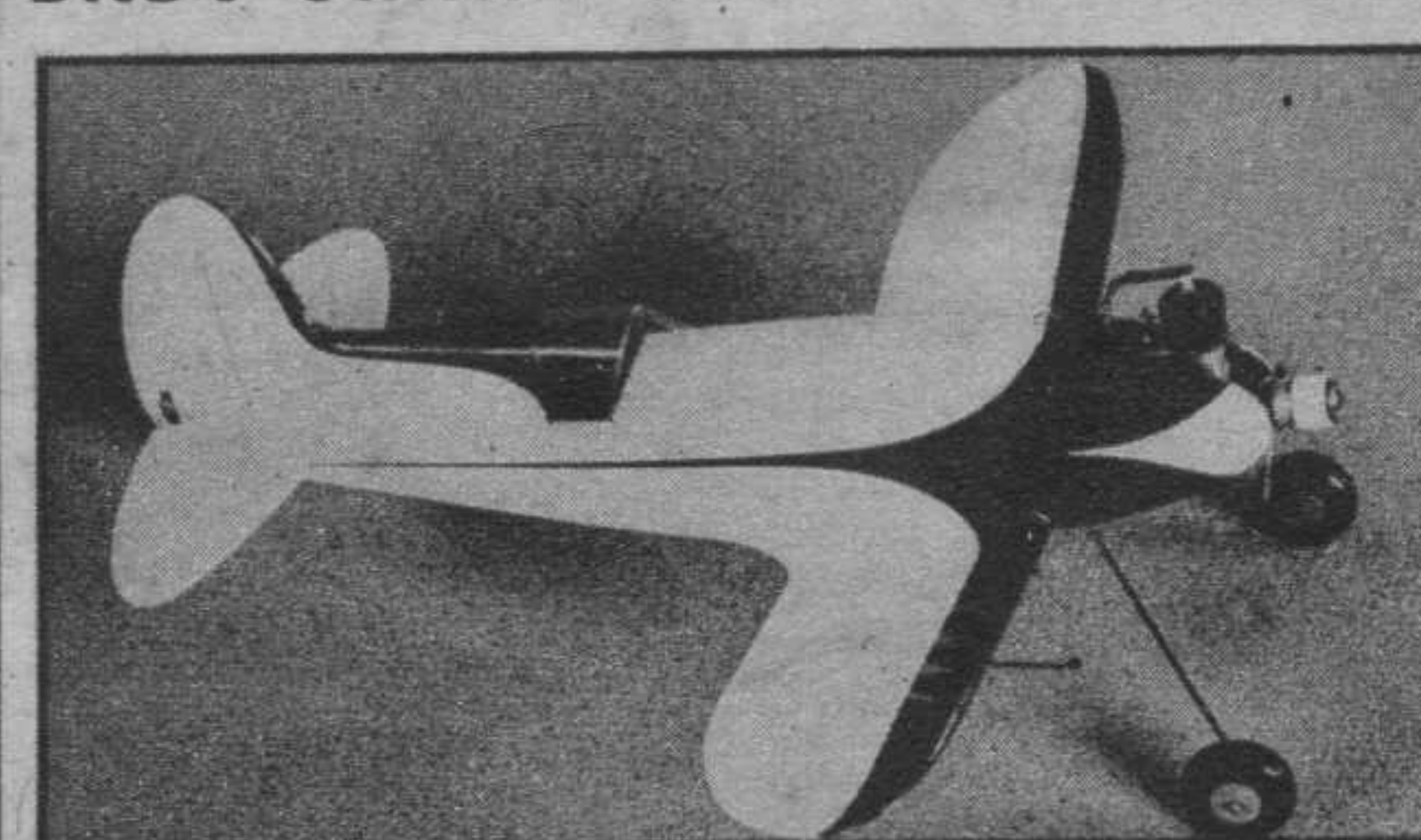
New Rubber Power Kit Two Gas Power Kits

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 20c

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.

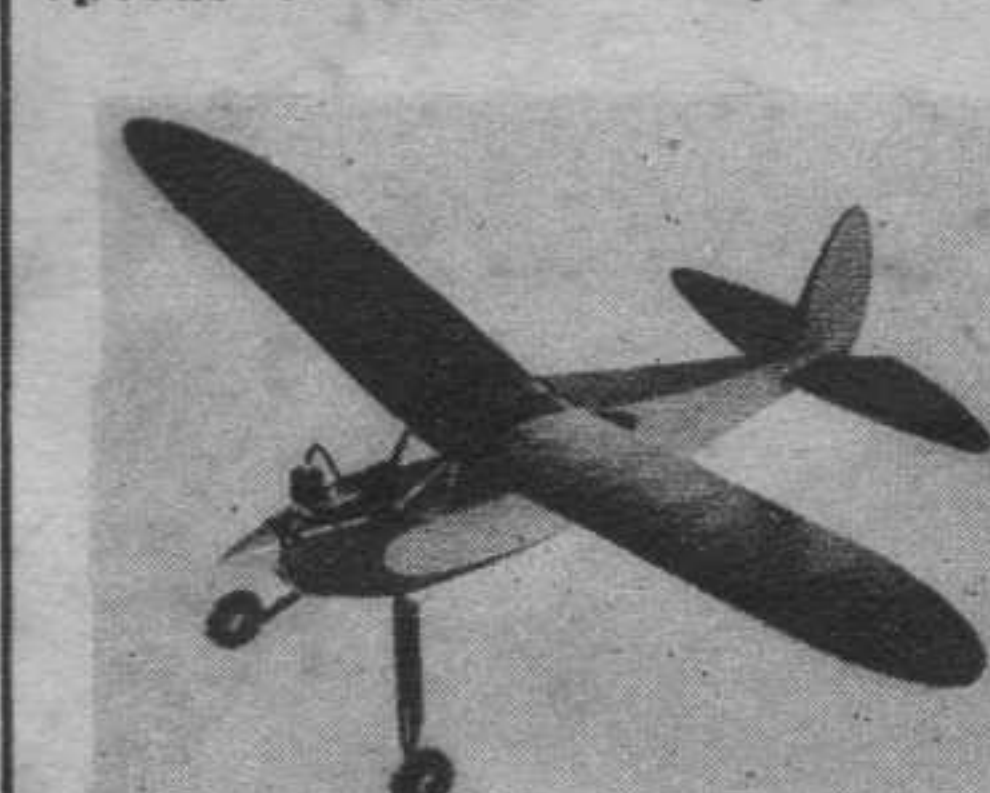
COMPLETE  
**\$1.98**  
KIT  
Postage 20c

TIGER SHARK SPEED DEMON



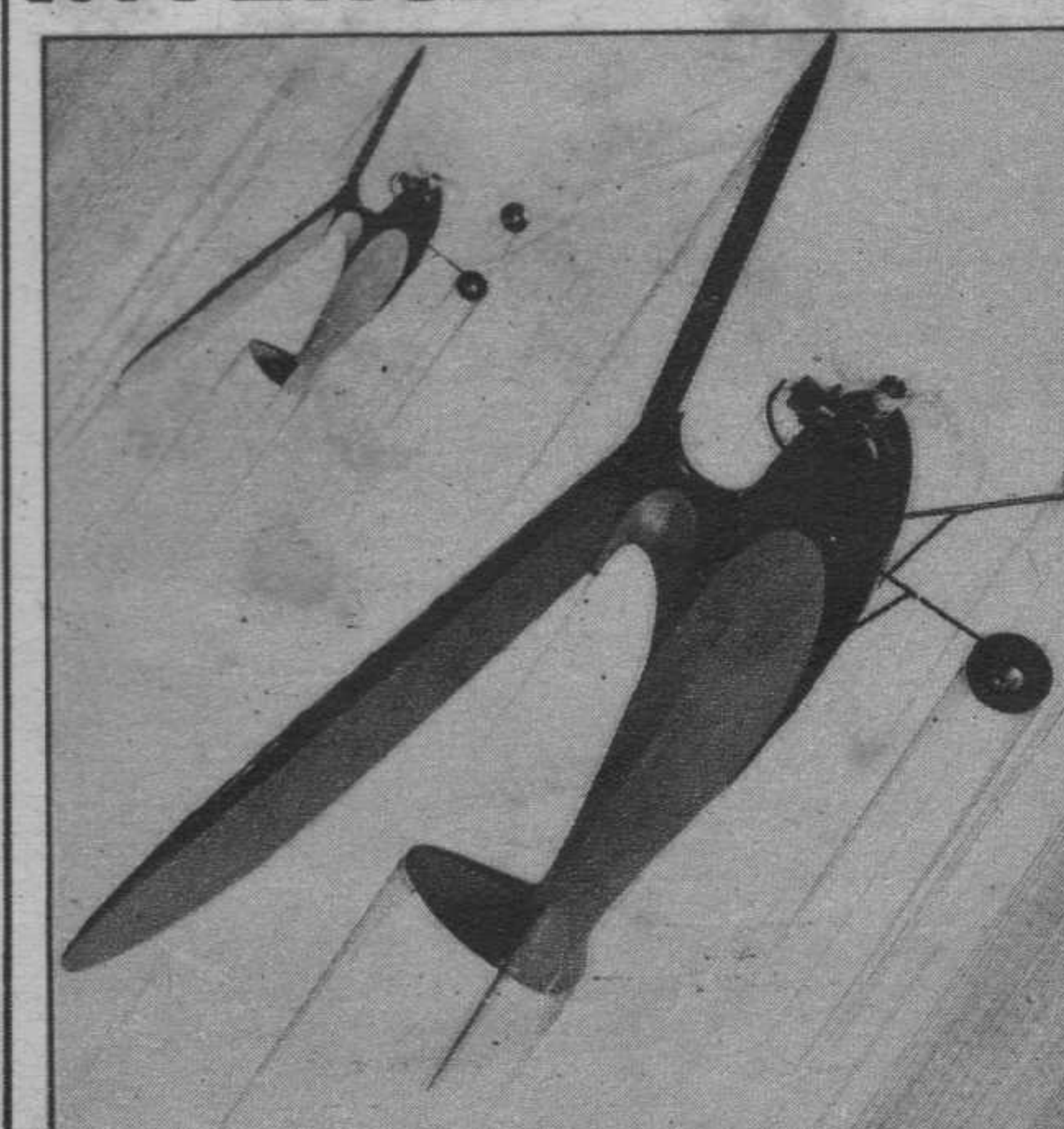
The TIGER SHARK, Super Speed Demon, is designed for all 1/5 H.P. motors. It roars through the air at unbelievable speeds of from 60 to 90 M.P.H.

DELUXE  
**\$4.95**  
KIT  
Postage 30c



**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.  
DELUXE  
KIT ..... **\$4.95**  
Postage 30c

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



# AGAIN AS ALWAYS BERKELEY Sets The Record PACE

Contests are being held all over the country. The leaders again this year are the great BERKELEY designs. Rugged construction and perfect flyability are the things that contest winners look for.

*Last Minute Flashes* tell us that the American Ace now holds the A.M.A. Class "B" National Record. The new record was established at Sacramento, Cal. K. G. PFEIFFER won the Arkansas State Championship finishing first with his BUCCANEER "Special" and second with his American Ace. Don't be left out of the running: start building a BERKELEY kit today.

## The Class "B" RECORD HOLDER AMERICAN ACE

54" Wingspan Henry STRUCK designed

**KIT CONTAINS**  
Silk for Pylon and Wing Center  
Streamlined Rubber Wheels  
Carved Propeller  
Removable Nose and Motor Unit  
Formed Piano Wire Landing Gear  
Printed Wood Parts  
Semi-Finished Wood Blocks  
Championship Berkeley Cement and Dope



**\$3.95**  
P. P.

Everybody's raving about the American Ace. Adapted from Struck's famous "New Ruler" gas model. Designed for maximum performance with engines of .29 cubic inch displacement, it can be powered with any engine from .19 to .49 displacement.

## BUCCANEER "SPECIAL"

**6 FOOT WINGSPAN  
3 LBS. COMPLETE**  
perfect Contest ship for  
"60" engines

This beauty is a "real he-man". A ship designed to give you plenty of the extras... Thrills, Excitement, and Performance!

The "BUC" Special will take plenty of flying and is a bear for punishment. Those who build the BUCCANEER Special alone know what a great ship it is. The highest strength-weight ratio of any model airplane. A glide ratio that is so amazing that it is a mystery. Everything points to the BUCCANEER Special as your best bet in Class "C".

**KIT COMPLETE INCLUDING**

Silkspar covering, clear and colored dopes, and a BERKELEY "Time-Air" Flight Timer and ignition switch.

**\$5.95**  
P. P.

## SINBAD THE SAILER

**TOWLINE Launched Glider with SPIRAL CONTROL  
50 INCH WING SPREAD**

**HENRY STRUCK DESIGNED**

This is Henry Struck's latest creation. Those who have built the Flying Cloud and the American Ace know the value found in BERKELEY-BUILT, Struck-designed kits. Real glider days are just ahead. Get your kit now and start building. Tell your local contest director to include towline gliders at your coming meet.

- Wing Area 250 sq. in.
1. Big 33x44" Plans
  2. Balsa covered leading edge on wing.
  3. Removable ballast box.
  4. All wood parts printed out.
  5. Liberal quantities of cement and dope.
  6. Silkspar covering.

**\$1.00**  
**COMPLETE**  
**10c EXTRA**  
**BY MAIL**

The first really new idea in towline gliders in 10 years. No longer are long, zig-zag runs necessary. To release the glider once it reaches altitude. No longer is it necessary to sacrifice a spiral glide in order to have a stable launch.

"SPIRAL CONTROL" works like a miracle. Just attach the "SPIRAL CONTROL" stick to SINBAD. Run a few feet in a straight line with the towline and SINBAD will shoot skyward, automatically releasing itself at the highest part of the launch. Then watch it glide! SINBAD spirals and cases its way into the nearest thermal for the longest, sweetest flight you ever saw. The secret of "SPIRAL CONTROL" is all contained in the most complete set of plans you ever worked from. Meets all A.M.A. glider rulings.

**BERKELEY**

**Newly Issued 52 PAGE CATALOG**

For sale at leading hobby shops throughout the U. S. A. The first complete catalog of power airplanes, race cars and speed boats, 52 pages each 6"x9" packed full of pictures and drawings. You need it as a reference book!

**5¢ COIN OR STAMPS**  
Limited Time Only

**MEN IN SERVICE**... Order your BERKELEY KITS through your local post exchange or ship service store.

**HOBBY CATALOG**  
BERKELEY MODELS INC. - 230 STEUBEN ST. B'KLYN, N.Y.

## Maco Makes Grade

(Continued from page 55)

Comet factory, a much larger supply of kits and parts was incorporated into the new outlay of stock. Since that time the firm has added to the lines carried until it now carries a representative stock of all the better-known model manufacturers.

In 1938 Mr. McCall not only became active as a businessman in modelcraft, but took to the flying end of the game. He organized the Propeller Gas Model Club, the name later being changed to the American Airlines Gas Model Club. Today this group has forty-five very active members, including the "boss" himself, who is quite a competent craftsman.

In 1939 the club took in the Nationals at Detroit, and in 1940 the Nationals at Chicago. Of course, Maco went along to supervise flying on both occasions, and his fatherly, or professional, touch produced excellent results. At Detroit, Robert Bessee won the Class B open event and at Chicago, Bill Schwab scored high in all three gas events. Bessee's picture, by the way, graces the cover of the Champion Spark Plug advertising folder.

The "boss" himself gets as big a kick out of flying as other members of the club, and last year won the open gas event at the Erie, Pennsylvania, meet. He has also placed in several meets, including a second in a Pittsburgh, Pennsylvania, contest. Officers of the club are Ralph Mitchell, president; William Barries, vice president; Eldred Hoopengartner, secretary, and H. D. McCall, treasurer. Air Trails readers who visit Cleveland this year for the Scripps-Howard air meet are cordially invited to stop in and visit with Mr. and Mrs. McCall and, of course, the members of the club.

The American Airlines Gas Model Club has sponsored an annual gas-model contest each year for the past two years. This year the meet will be held on August 10th.

## Photo Credit List

The following list shows the sources from which credited photos were obtained. Abbreviations: bot., bottom; T., top; U.L., upper left; U.R., upper right; L.C., left center; R.C., right center; L.L., lower left; L.R., lower right; Cen., center; T.C., top center; B.C., bottom center.

- Bombers by Martin.  
Page 10—Top, Acme; Bot., Martin.  
Page 11—All by International.  
Page 12—All by International.  
Page 13—All by International.  
Page 14—Top L., Official photo U. S. army air corps; Top R., Rudy Arnold.  
Page 15—Both by Boeing Aircraft.  
Page 17—Top, Courtesy The Aeroplane magazine.  
Page 18—Cent., Republic photo; Bot., Acme.  
Page 19—Bot. L., Bell Aircraft photo; rest by Rudy Arnold.  
Page 20—Top L., International; Top R., British-Combine; Bot. L., Wide World; Bot. R., British-Combine.  
Page 21—Top, Loomis; rest by Bond.  
Page 24—Top, N. A. C. A. photo; Cent., Westinghouse photo.  
Page 26—Fletcher—"PIC."  
Page 28—Top, Curtiss-Wright; Cent. L., Curtiss-Wright; Cent. R., United Air Lines; Bot., Air Express photo.  
Page 29—Top, Air Express photo; Bot. L., Boeing; Bot. R., Curtiss-Wright.  
Page 34—Rudy Arnold.  
Page 35—Rudy Arnold.  
Page 41—Top L., sec. from bot., Kulick; Bot., Gross.  
Page 42—Kulick.  
Page 43—Sec. from Top R., Sovfoto; rest Kulick.  
Page 44—Bot., Daraghy.

## Air Trails Advertisers August 1941

### SCHOOLS

Aero Industries Technical Institute	Back Cover
Aeronautical University	32
American School of Aircraft Instruments	32
California Flyers	7
Curtiss Wright Technical Institute	5
Faust Aircraft Sheetmetal Tr. School	36
Fletcher Aircraft Schools	36
Lincoln Aeronautical Institute	39
Luscombe School of Aeronautics	4
Meyer Engineering	39
Parks Air College	3
Roosevelt Aviation School	9

### MODEL AIRPLANE KITS, MOTORS and SUPPLIES

Aircraft	61
American Supercraft Corp.	61
Bay Ridge Model Airplane & Supply Co.	63
Beebe Products	61
Berkeley Models, Inc.	66
Best By Test Model Co.	62
William L. Brown, 3rd	64
Capitol Aircraft & Supply Co.	62
Cleveland Model & Supply Co.	64
Comet Model Co.	Third Cover
C Z Model Airplane Co.	63
Flo-Torque Propellers	60
G. H. Q. Motors	61
Herkimer Tool & Model Works	56
H & F Model Airplane Co.	60
Ideal Airplane & Supply Co.	56
Imperial Model Supply Co.	64
Jackson's	61
Megow's	59
Mercury Model Airplane Co.	62
Metro Modelcraft & Supply Co.	61
C. Meyer	61
Modelcraft	56
Model Research Labs	56
Ohlsson & Rice Mfg. Co.	59
Phantom Motors	40
Polk's Modelcraft Hobbies	62
Radio Control Headquarters	58
Ritz Manufacturing Co.	61
Clifford Williams Rogers	63
Scientific Model Airplane & Supply Co.	57
Skyway Model Aircraft Supply Co.	58
M. B. Spotts	60
Victor Stanzel & Co.	65
Testor Cement Co.	61
Trost Model Airplane Shop	62
Trymo Hobbycraft	62
Waterbury Builders Supply Co.	56
Cecil Winik	58

### MISCELLANEOUS

Aeronca Corp. of America	37
Charles Atlas	36
Craft Art Co.	32
Dodd Mead & Co.	32
Harley-Davidson Motor Co.	38
Jardur Import Co.	36
Robert M. McBride & Co.	65
McGraw-Hill Book Co.	36
Piper Aircraft Corp.	31
Ronald Press Co.	6
D. Van Nostrand Co.	33
Vogue Binocular Co.	39

While every precaution is taken to insure accuracy, we cannot guarantee against the possibility of an occasional change or omission in the preparation of this index.

**Berkeley MODELS INC.** 230 STEUBEN ST. Dept. AT-8 BROOKLYN, N. Y.



# IT'S DRAMATIC!

**COMET'S  
"INTERCEPTOR"**

**SENSATIONAL  
GAS  
MODEL**



**CLASS  
"A" and "B"**

**ANOTHER  
TRIUMPH  
FOR**

**CARL GOLDBERG . . . .**

**C**HALK up another one for Comet and Carl Goldberg! The new and sensational "INTERCEPTOR" Gas Model is the result of two solid years of experimentation and testing — and the results justify every prediction and every claim made for this truly remarkable Class "A" and "B" gas model! Already the "INTERCEPTOR," even before its release to the public, has taken first place in four out of five contests, with performances nothing short of phenomenal! Remarkably simple in construction, endowed with exceptional climbing and gliding characteristics, the "INTERCEPTOR" has already earned the right to be called the finest Class "A" and "B" model!

**\$2.50**

Order from dealer  
and save postage  
or mail additional  
25c

**AMAZING  
PERFORMANCE**

**T**HE "INTERCEPTOR'S" sensational performance is the result of the remarkably light weight and low air drag which is inherent in its design. A new wing section also adds to its performance. Its stability has been proved by 2 years constant testing.

Class "A"

Span . . . . . 42 in.  
Weight . . . . . 16 oz.  
Climb . . . . . 1600 ft./min.  
Area . . . . . 2 sq. ft.  
Wing loading . . . . . 8 oz./sq. ft.

Class "B"

Span . . . . . 48 in.  
Weight . . . . . 18½ oz.  
Climb . . . . . 2200 ft./min.  
Area . . . . . 2.3 sq. ft.  
Wing loading . . . . . 8 oz./sq. ft.



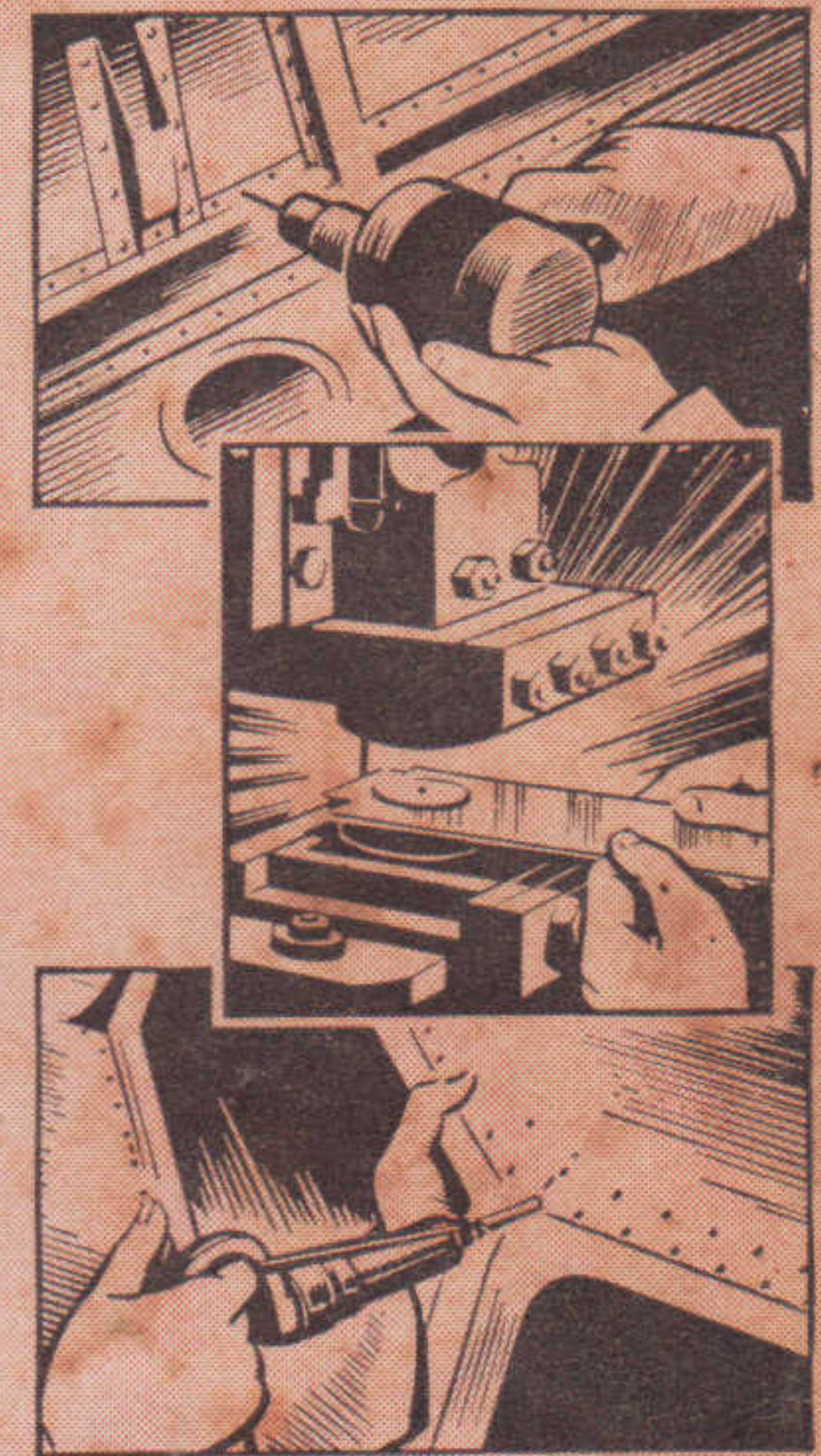


# Do You Know What *Up-grading* Means..in Aviation?

## —It Means Everything to You... After You Get Into the Aircraft Industry

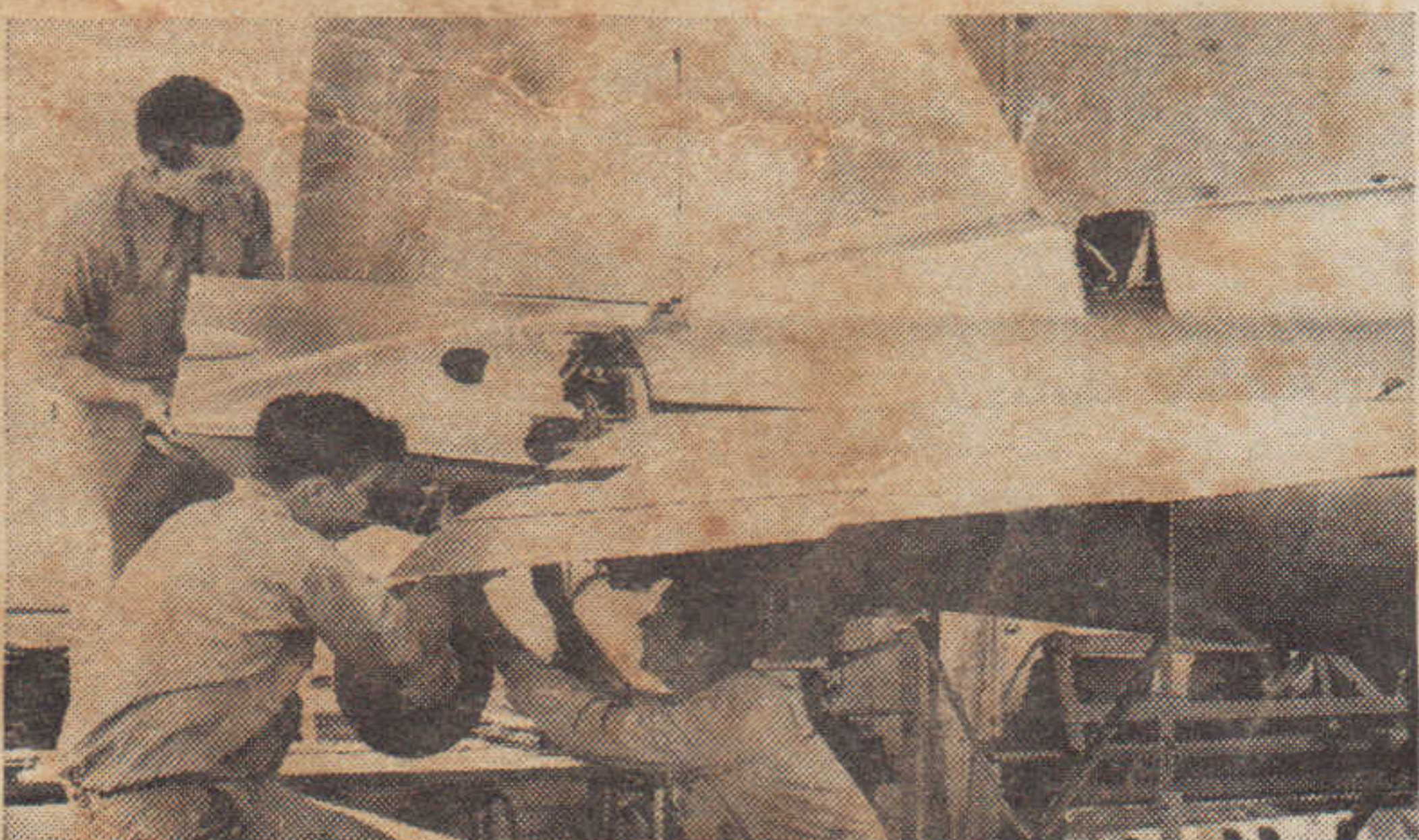
How fast you advance...how far you go...depend on how well you turn out in the aircraft industry's "Up-grading" process. This is a system of testing and developing a man's skill in one type of work after another, "up-grading" him to more and more important duties. Under this plan, your superiors would hope that you would gain all-around proficiency and could then be entrusted with supervision of the work of others. After that would follow the industry's unlimited opportunity to hold posts of greater and greater responsibility, to win prominence, leadership, and success.

If you enter the industry trained to do only some routine hand or machine operation, you must start at the bottom in the up-grading process. IF you perform this one starting job satisfactorily you may be entrusted with a more important task. IF you are able to "make the grade" in the whole up-grading program you may win your first supervisory job. ALL depends on how good your aviation school training was, on how wide a range of skills your school could give you the opportunity to achieve, on how broad and detailed a store of technical aircraft knowledge you were taught. Read below what it can mean to you—in these respects—to be an Aero ITI-trained man.

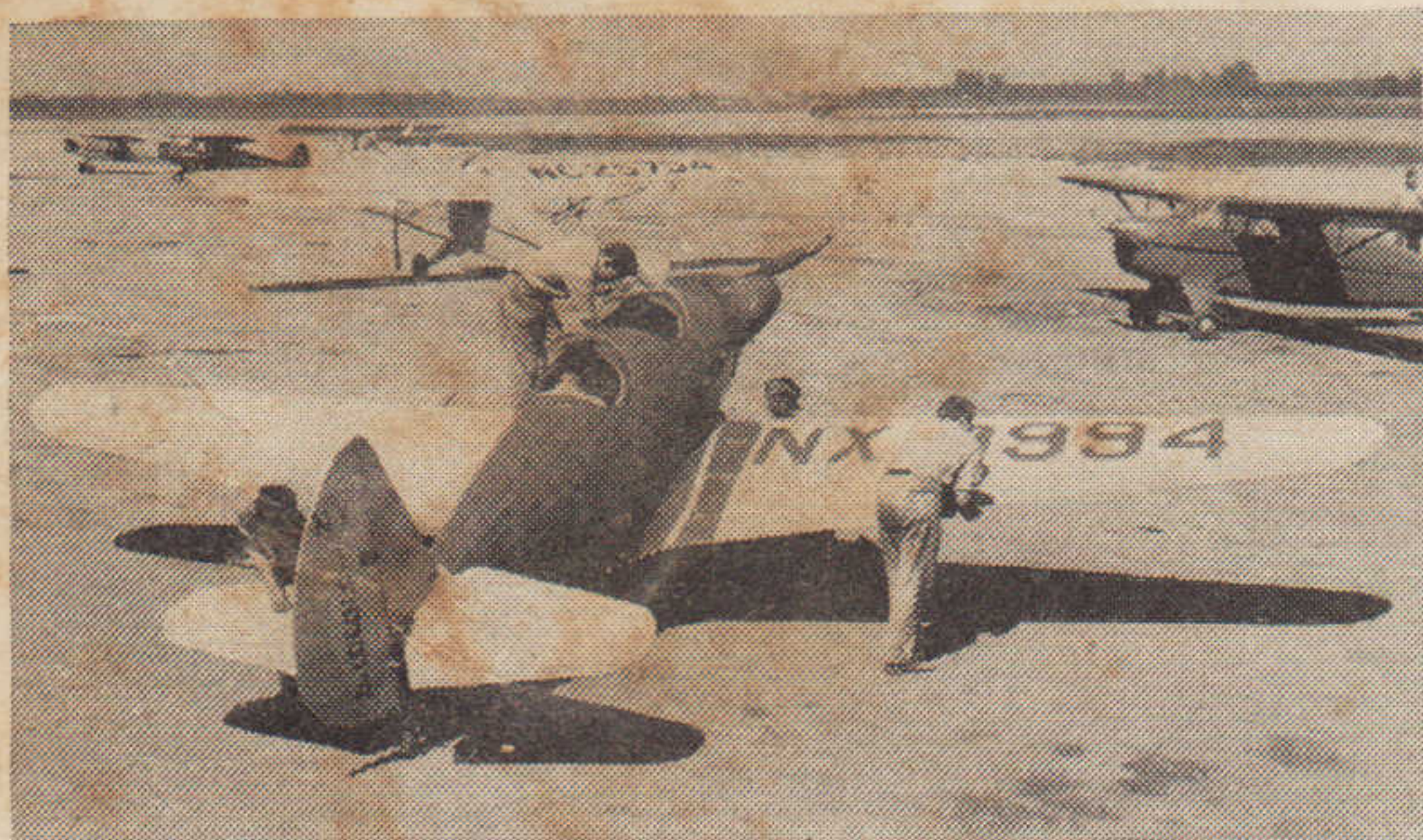


Operations like these—drilling, riveting, running a punch press—are typical routine, manual labor jobs for which short "job training" prepares you. This is where you start in aircraft work...where you may STAY...when you do not have the advantages of broad, thorough training...such as given by Aero ITI.

## As an Aero ITI-Trained Man —Up-graded in Advance You Can Go Farther Faster in Aviation



Assembly of the various aircraft components into complete planes—including large, all-metal ships—is a standard part of Aero ITI training...giving you priceless experience far advanced over simple operations such as drilling and riveting.



Here you see Aero ITI students—both mechanics and engineers—giving a student designed and built plane final inspection before its first test "hop"...a typical example of how Aero ITI training reaches the ultimate in practical experience.

As an Aero ITI-trained man your up-grading is already well along BEFORE you enter the industry. This is PROVED by the outstanding records of the 2766 graduates employed by 99 firms in aviation. It is the rule rather than the exception that Aero ITI-trained men are soon advanced beyond their starting jobs. Many have gone through the more advanced stages of up-grading quickly—or been excused from it entirely—and soon placed in supervisory posts. Many more have stepped directly from Aero ITI into preferred jobs—responsible jobs, such as power plant installation, final assembly, experimental, and inspection.

The superiority of Aero ITI training has also won many graduates jobs with the big airlines...in maintenance work, one of the finest jobs in all Aviation. Aero ITI engineering graduates, too, consistently are selected for the more specialized phases of aeronautical engineering because of their more practical, more thorough training.

Before starting ANY aircraft training, for ANY branch of Aviation, be sure it will take you a long way, that it will bring you real success. These are the all-important reasons you should be satisfied with nothing less than Aero ITI training. For the sake of your whole future, write today, or send the coupon, and get complete information on what Aero ITI training can mean to you.

### AERO INDUSTRIES TECHNICAL INSTITUTE 5257 West San Fernando Road, Los Angeles, California

Please send information on Aero ITI training for Aviation careers. I am interested in the following branch of Aviation: ☐ Aircraft Mechanics; ☐ Aeronautical Engineering; ☐ Undecided, please send more information. Years High School: ☐ 1, ☐ 2, ☐ 3, ☐ 4. Years College (Liberal Arts): ☐ 1, ☐ 2, ☐ 3, ☐ 4. Years Engineering College: ☐ 1, ☐ 2, ☐ 3, ☐ 4.

Name \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ a-44-T

### ADVISORY BOARD

**ROBERT E. GROSS**  
President, Lockheed  
Aircraft Corporation

**JOHN K. NORTROP**  
President  
Northrop Aircraft, Inc.

**C. A. VAN DUSEN**  
Vice Pres., Consolidated  
Aircraft Corporation

## AERO INDUSTRIES TECHNICAL INSTITUTE

5257 WEST SAN FERNANDO ROAD, LOS ANGELES, CALIFORNIA

5 Courses In AIRCRAFT MECHANICS and AERONAUTICAL ENGINEERING—Including 12 Month Mechanics Course Approved by U. S. Civil Aeronautics Administration