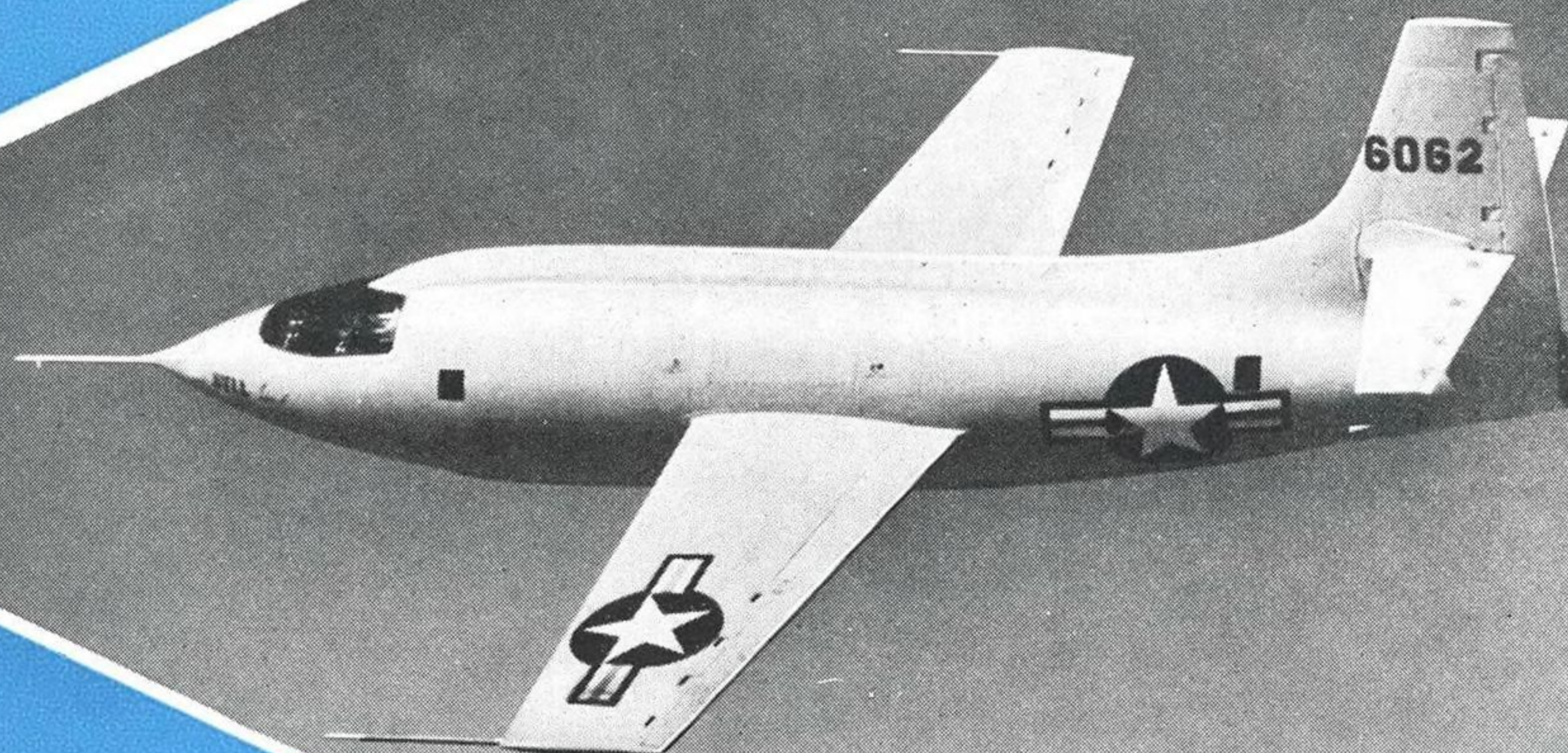


AVIATION WEEK

A MCGRAW-HILL PUBLICATION

SEPT. 20, 1948



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First ship to break the sonic barrier — Bell Aircraft Corporation's rocket-propelled X-1 is equipped with Goodyear tires, tubes, wheels and brakes. Designed to fly at a top speed of 1700 m.p.h. under the full 6,000-pound thrust of its four-unit rocket engine, the X-1 has the strongest airframe ever built.

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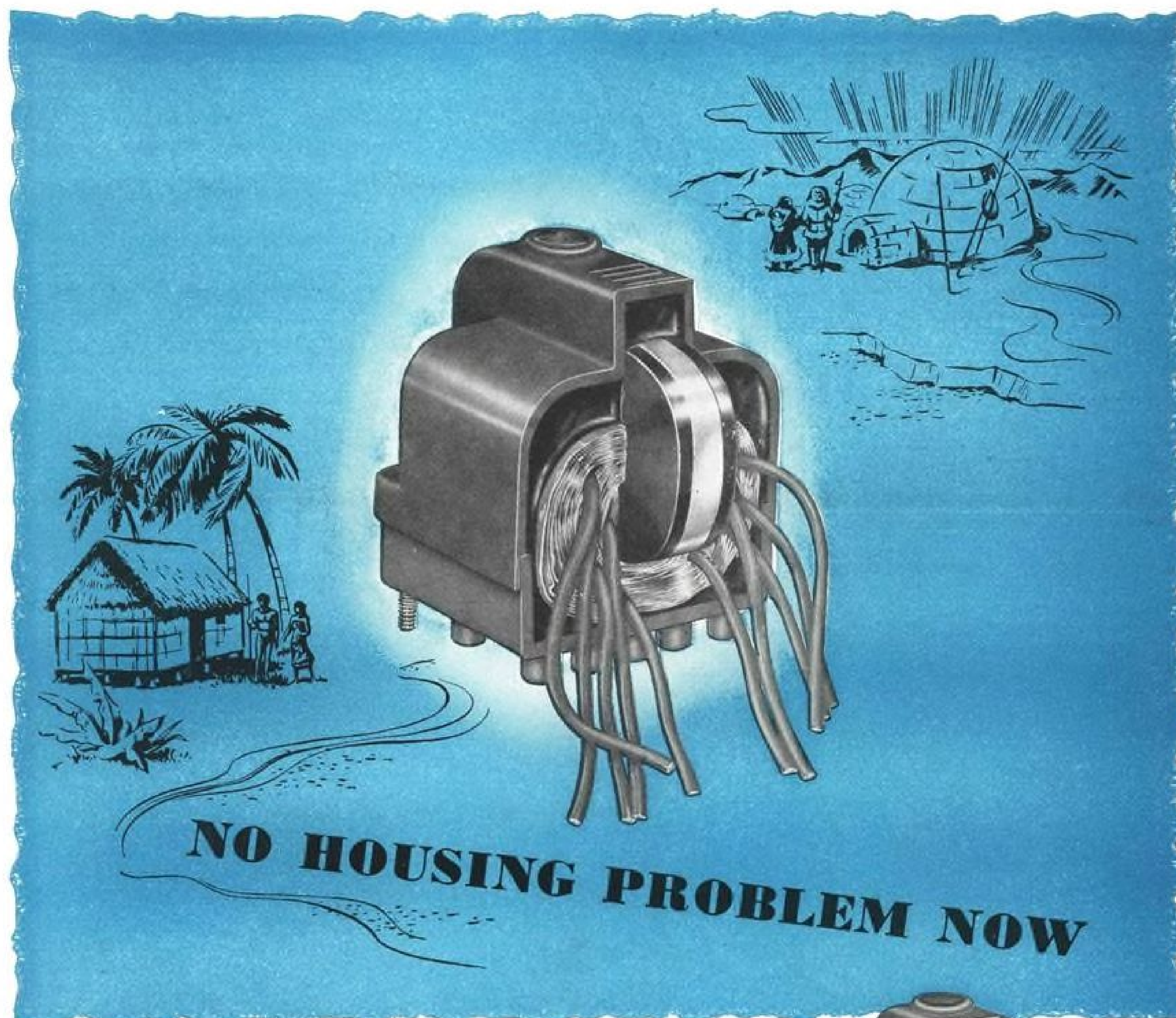
and Goodyear magnesium-alloy wheels were specified. Because it has proved stand-out in dependability, safety and performance under the severest service conditions on all types of aircraft, Goodyear tire, wheel and brake equipment is more widely used than any other make. To consult our engineers on any tire-wheel-brake problem, write: Goodyear, Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.



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"Safe-Lock" terminals may be ordered loose or attached to cable in complete assemblies . . . units can be ordered to measurement, ready for installation.

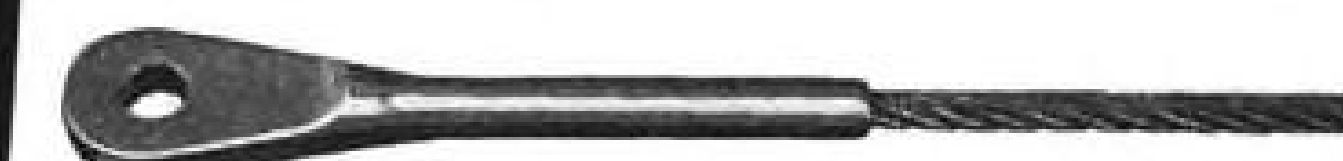
Macwhyte "Hi-Fatigue" PREformed Aircraft Cable is available in either Galvanized or Stainless Steel, in reel lots, or specified lengths. For complete information on Macwhyte "Safe-Lock" terminals and "Hi-Fatigue" Aircraft Cable, send for Catalog A-1.



"Safe-Lock" Terminal cut away to show fitting and cable after swaging.



AN 669 Standard Turnbuckle End



AN 668 Standard Eye End



AN 667 Standard Fork End



AN 666 Standard Stud End



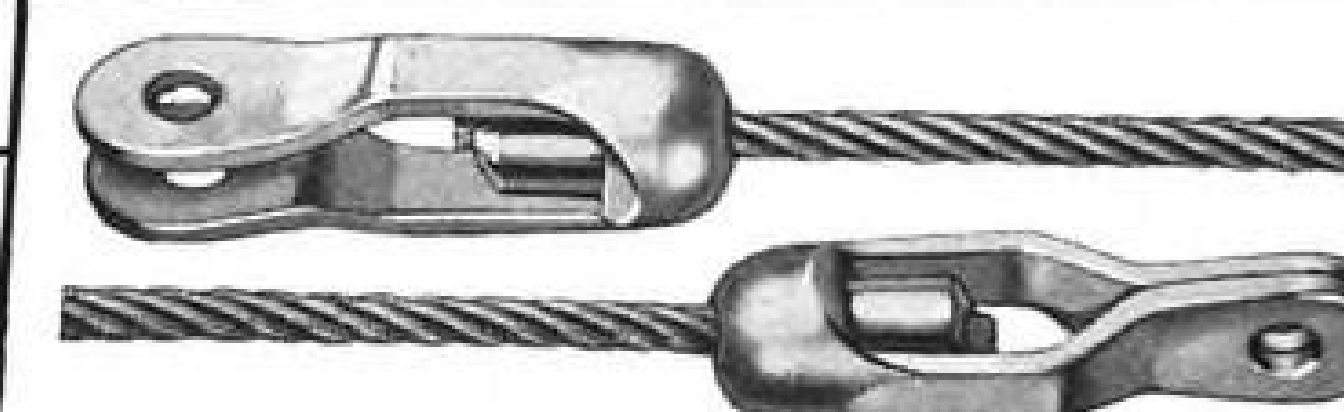
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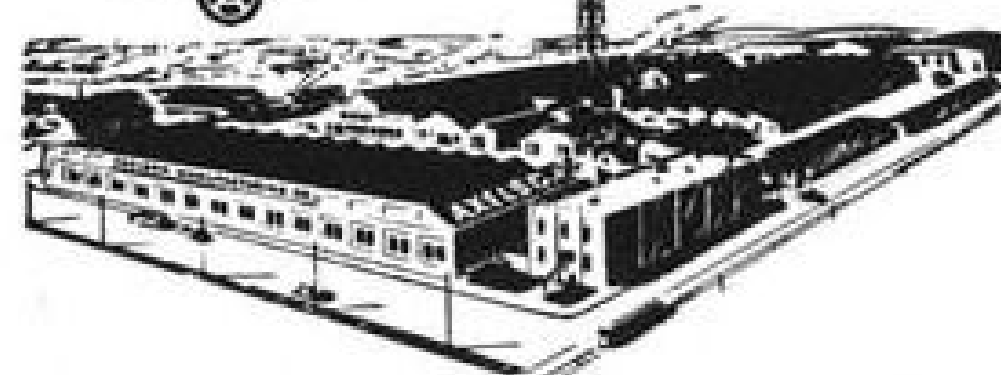
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Axelson is currently producing superchargers for cabin pressurization of the Douglas DC-6 airplane. Numerous Axelson experimental projects are under way, in design stage, production stage and on actual operating tests. Axelson engineering maintains constant research to provide more efficient equipment, combining economy with finest quality.



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AVIATION WEEK

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September 20, 1948

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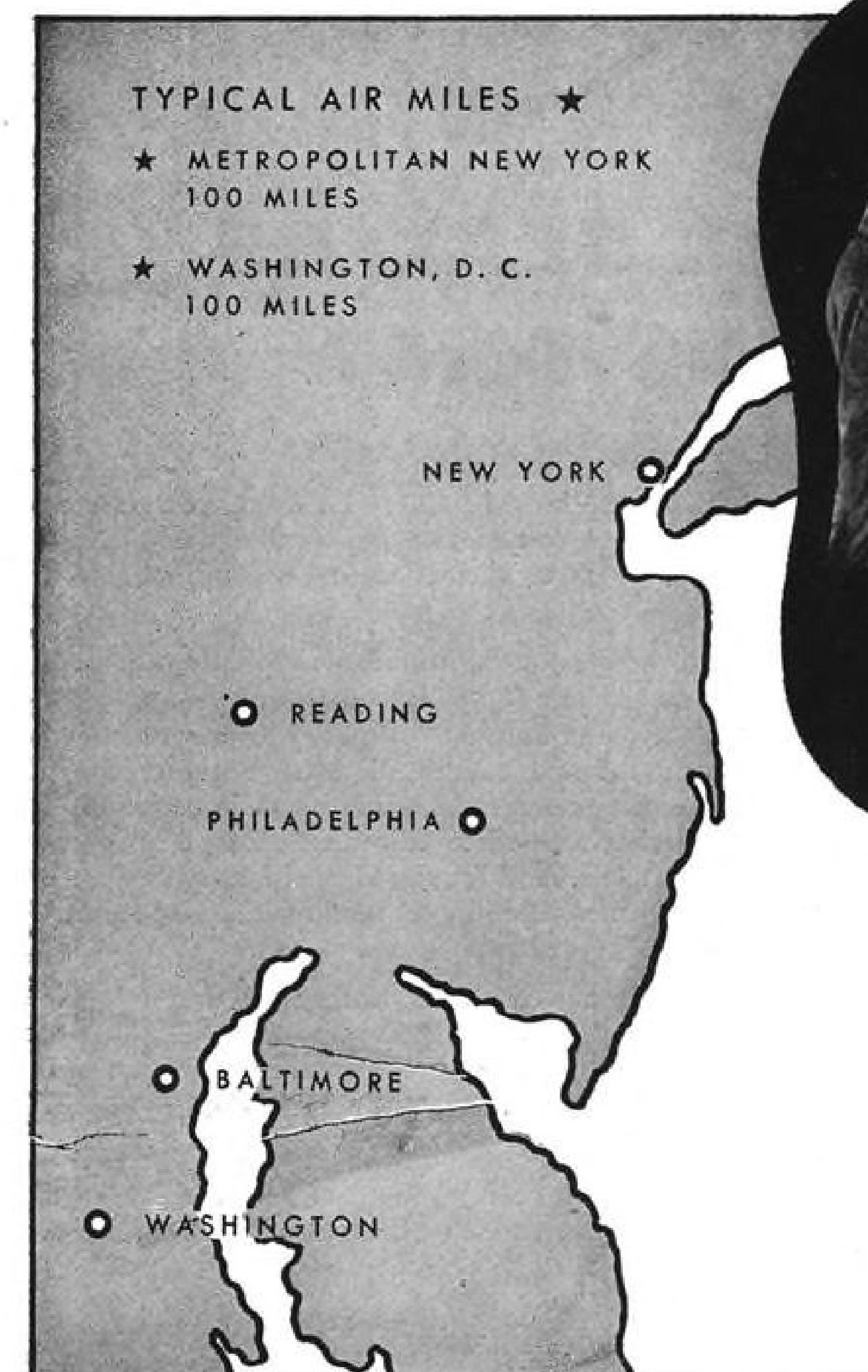
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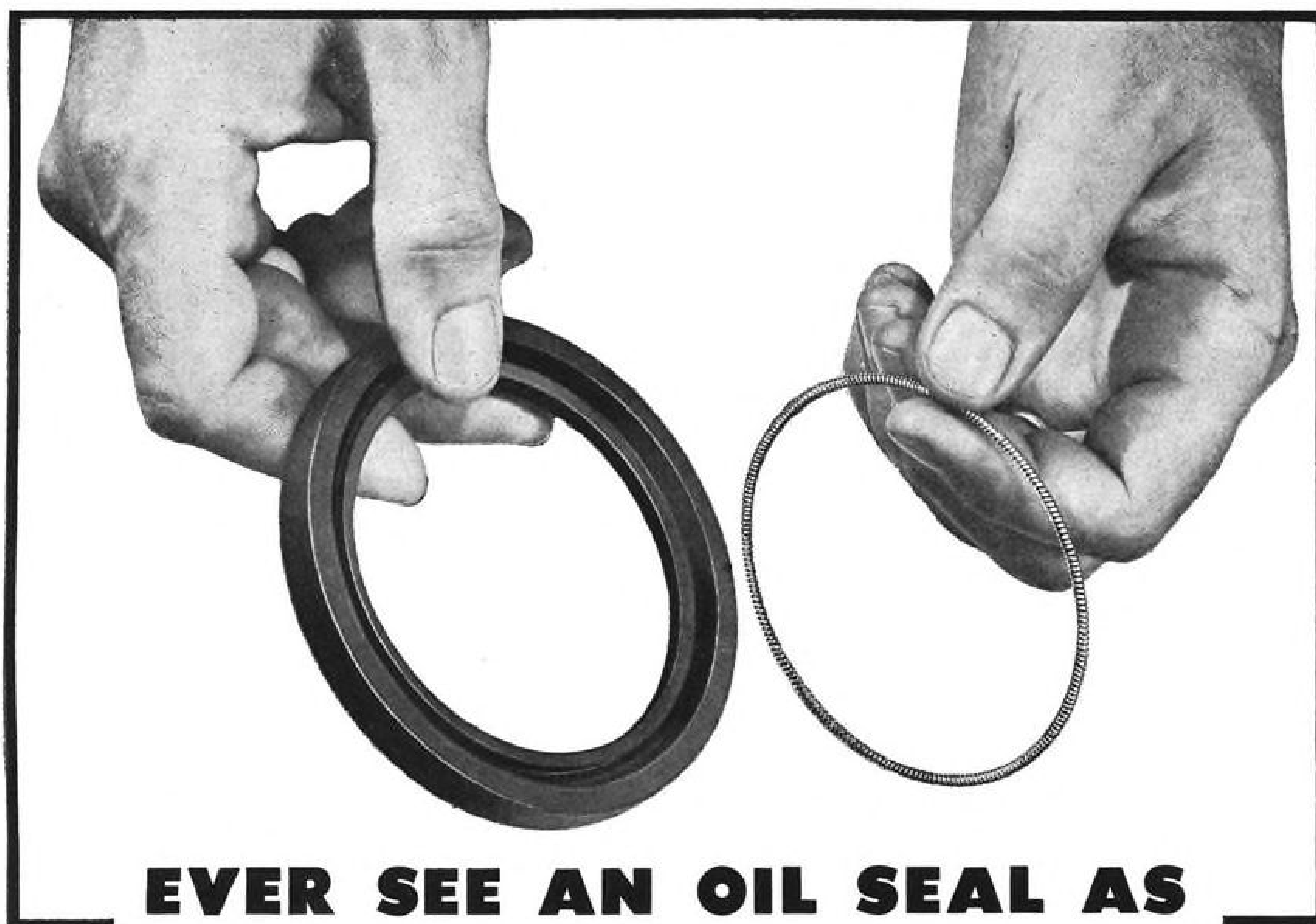
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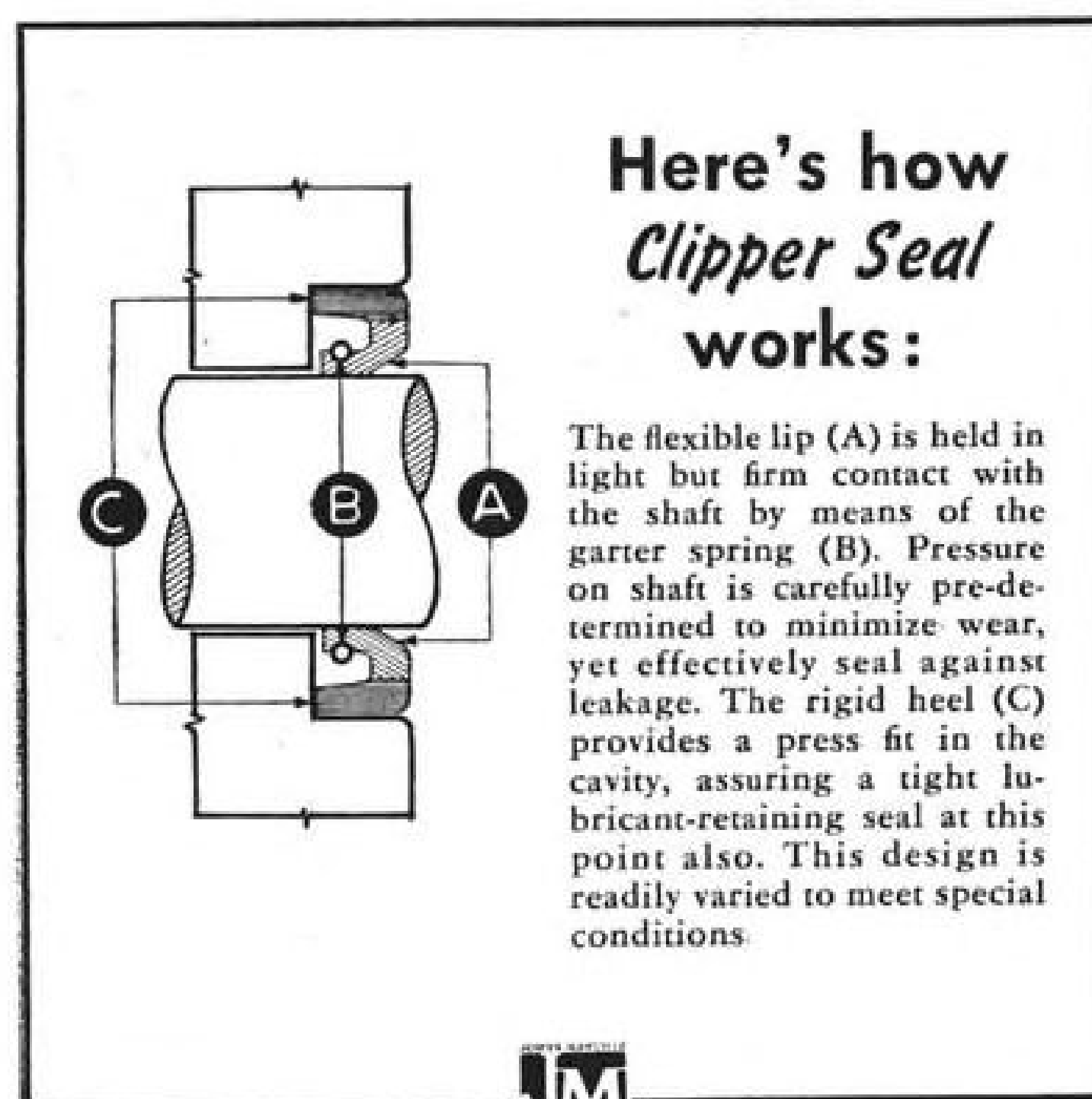
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AVIATION WEEK, September 20, 1948



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Clipper Seals are made in both split and endless types and are available for shafts up to 66" in diameter. They are recommended for sealing against oil, grease, water, air, grit and coolants at operating temperatures up to 450° F.

For further information, write for brochure PK-31A. Address Johns-Manville, Box 290, New York 16, N. Y.

NEWS DIGEST

DOMESTIC

Price increase on the 1948 Ercoupe Model E to \$3790 flyaway Riverdale, Md., from \$3590 has been announced by Sanders Aviation, Inc., effective Sept. 21.

An Illinois state advisory committee has presented plans to Governor Green proposing a \$300,000,000 central air, rail and highway terminal for Chicago. The terminal would be built near Joliet, Ill., about 23 miles southwest of the loop.

CAB has instituted an investigation of TWA's complaint that Seaboard & Western Airlines, New York, has been operating cargo and passenger flights to foreign points in violation of the Civil Aeronautics Act.

Gen. Lucius D. Clay promised that the Berlin airlift will be expanded during the winter through the use of more planes and utilization of new runways now being built. Five Fairchild C-82 Packet transports have already joined "Operation Vittles".

FINANCIAL

Bendix Aviation Corp. reports net income for nine months ended June 30 of \$7,019,489. Profit for third quarter alone amounted to \$2,837,543.

Lockheed Aircraft Corp. declared dividend of 50 cents a share payable Oct. 1. Distribution of like amount was made July 2, bringing dividends this year to \$1, as against none last year.

Sperry Corp. and its domestic subsidiaries report net income of \$4,284,060 after taxes for first-half 1948, equivalent to \$2.11 per share. Income for the same period in 1947 was \$3,576,434 or \$1.76 per share. Unfilled orders at July 31, 1948, were approximately \$140,000,000 compared to \$60,000,000 at the same time last year and \$101,000,000 at the end of 1947. Working capital June 30, 1948, amounted to \$33,298,642. Semi-annual dividend of \$1.00 per share was paid on July 9. Two dividends in 1947 were 75 cents each.

FOREIGN

British South American Airlines has increased its schedules between Nassau and Miami from three-a-week to eight-a-week. No Sunday schedules are flown but twice-daily schedules are in effect on Monday and Fridays.

Economic Cooperation Administration has authorized the Netherlands to spend \$5,000,000 for the purchase of seven Douglas DC-6 transports for KLM.

INDUSTRY OBSERVER

► Credit McDonnell test pilot Ed Shoch with saving that company's XF-85, experimental jet parasite fighter designed for use with Convair's B-36. Initial XF-85 flight tests were made at Muroc from a specially equipped Boeing B-29. On the first attempt at midair recapture, rough air hampered Shoch's approach at 25,000 ft. The B-29 trapeze hit the XF-85 canopy smashing the Plexiglas. Shoch was bashed on the head by the trapeze which also knocked off his crash helmet and oxygen mask. Refusing to bail out, Shoch jammed the oxygen hose in his mouth and then maneuvered the parasite to an emergency landing on the Muroc desert. The parasite, which carries an emergency landing skid but no landing gear, stalled at about 175 mph. Only damage sustained in landing was a broken wing tip and a bent lower vertical fin.

► Republic's XR-12 recently completed a 2700-mile transcontinental photo mission averaging 375 mph. at 40,000 ft. Flown by a USAF crew, the four-engine photo plane took off from Muroc and climbed to 40,000 ft. over the Pacific before beginning its photo run at the California coast near Santa Barbara and ending over New York City. The XF-12 landed at Mitchel Field after a total of eight hours in the air.

► McDonnell's sweptwing XF-88, a USAF penetration fighter, is undergoing flight tests at Muroc. This experimental model is powered with two Westinghouse 24C jet engines located in the plane's belly. The XF-88 is expected to join the North American F-86A in the 700-mph. class.

► British are working on sweptwing versions of their Vickers Supermarine Attacker and the new Hawker N.7/46, both better than 600-mph. fighters in their present straight wing versions.

► Northrop RB-49 flying wing bombers, now being readied for production at Convair Fort Worth plant, will carry elaborate photographic equipment for long-range mapping missions. The high-speed characteristics of the huge, eight-jet craft (500-mph. top speed, 8000-fpm. rate-of-climb) make it ideal for photo-reconnaissance missions.

► Air Force has revealed that lack of lubricants meeting military requirements for extreme temperature operation is jeopardizing all-weather aircraft design. Inability of lubricants to perform satisfactorily under conditions for which all-weather fighters are being designed seriously threatens the entire program. AIA Airworthiness Requirements Technical Committee has undertaken a study of alleviating measures.

► CAA has at last taken cognizance of airline complaints on smoke detection equipment and has initiated a baggage compartment fire test program, in separate phases, at the U. S. Bureau of Standards and the CAA Indianapolis test center. Preliminary results on evaluation tests of existing detectors, which have been condemned by the airlines, will be submitted to CAB for consideration in extending the Nov. 1 deadline for smoke detection installations.

► Substantial increase in the 500-mph. top speed of the North American B-45 four-jet tactical bomber is assured with the installation of the General Electric J-47 turbojet engine in the B-45C model. The new engine has a 5000-lb. rating, compared to the 4000-lb. thrust rating of the Allison J-35 installed in the B-45A production model.

► Curtiss-Wright airplane division has delivered first of 36 overhauled and modified R5C Commando transports under Navy contract. No. 1 airplane went to N.A.S. Patuxent, No. 2 into service at San Diego and No. 3 into service at Columbus. Airplane division is nearing completion on its contract for R4D (Douglas DC-3) overhaul, having delivered 64 of a total of 74 being processed.

► Lockheed has completed the mockup of the P2V-4 Neptune patrol plane powered by two Wright-2600 compound engines. Model P2V-3 production has been doubled in the last few weeks, increasing from one and one-half to three ships per week in accordance with accelerated Navy production schedules.

► First Navy unit of Lockheed Shooting Stars, squadron CF-6A, is now being formed at North Island Naval Air Station, San Diego, Calif., under the command of Cmdr. E. J. Pawka. Navy enlisted personnel are now attending classes in Allison J-33 turbojet engine maintenance at Indianapolis. The first of the Lockheed F-80 fighter-trainers, designed TO-1 by the Navy, will be delivered shortly.

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to lend courage to
our convictions

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Sept. 19-21—Twelfth International Convention, Northwest Aviation Planning Council, Vancouver, B. C.

Sept. 20—IATA executive committee, Brussels.

Sept. 20-21—American Society of Mechanical Engineers, Aviation Division, Dayton-Biltmore Hotel, Dayton, Ohio.

Sept. 20-21—American Society for Testing Materials, board of directors, Philadelphia.

Sept. 24—ICAO legal committee insurance meeting, Lisbon.

Sept. 24-26—Air Force Association National Convention, Hotel Commodore, New York.

Oct. 6-8—National Association of State Aviation Officials, Copley Plaza, Boston.

Oct. 6-9—Society of Automotive Engineers aeronautic meeting, Biltmore Hotel, Los Angeles.

Oct. 14—Annual Air Line Dispatchers Association convention, Edgewater Beach Hotel, Chicago, Ill.

Oct. 15-24—International aircraft exhibit, Royal Danish Aeronautical Society, Copenhagen.

Oct. 17-21—National Aviation Clinic, Detroit.

Oct. 18—AIA personal aircraft council, Detroit.

Oct. 18-23—American Society of Travel Agents, Savannah, Ga.

Oct. 20-21—National Safety Council, Air Transport Section, Hotel Stevens, Chicago.

Oct. 21-22—Society of Automotive Engineers production meeting, Statler Hotel, Cleveland.

Oct. 22-23—4th Annual Arizona Aviation Conference, sponsored by Chamber of Commerce, Prescott.

Oct. 25-26—Third Annual Indiana Aviation Conference, Purdue University, Lafayette, Ind.

Oct. 28—Society of Automotive Engineers, metropolitan section transportation and maintenance meeting, Engineering Societies Bldg., New York City.

Nov. 4-5—Society of Automotive Engineers, fuels and lubricants meeting, Mayo Hotel, Tulsa, Okla.

Nov. 9—ICAO operations division, Montreal.

Nov. 13-16—American Society for Testing Materials, petroleum products and lubricants, Drake Hotel, Chicago.

Nov. 15-17—Aviation Distributors and Manufacturers Assn., sixth annual meeting, Hotel Statler, Cleveland.

Nov. 15-17—National Aviation Trades Assn., annual meeting, Allerton Hotel, Cleveland.

Nov. 16—ICAO airworthiness division, Montreal.

Nov. 16-17—American Society for Testing Materials, plastics, Atlantic City, N. J.

Nov. 16-18—National Association of Travel Officials, Miami Beach.

Nov. 17-19—American Society for Testing Materials, electrical insulating materials, New York.

Nov. 18-19—American Society for Testing Materials, structural sandwich materials, Philadelphia.

Nov. 23—ICAO southeast Asia regional air-navigation meeting, New Delhi.

Dec. 2-5—Fourth annual international aviation celebration, El Paso.

Dec. 17—Annual Wright Brothers Lecture, Institute of the Aeronautical Sciences, U. S. Chamber of Commerce Bldg., Washington, D. C.

Jan. 10-14, 1949—Society of Automotive Engineers, Annual Meeting and Engineering Display, Hotel Book-Cadillac, Detroit, Mich.

Jan. 27—Society of Automotive Engineers, metropolitan section, fuels and lubricants meeting, Engineering Societies Bldg., New York City.

Feb. 8—ICAO Operations Division, Montreal.

Mar. 3—Society of Automotive Engineers, Metropolitan section, airtransport meeting, Engineering Societies Bldg., New York City.

A collection of 16 black and white silhouettes of various aircraft, arranged in a grid-like pattern. The aircraft include: a large four-engine bomber (top left); a twin-engine fighter (top center); a large four-engine bomber (top right); a twin-engine fighter (top far right); a twin-engine fighter (middle left); a large four-engine bomber (middle center); a twin-engine fighter (middle right); a large four-engine bomber (middle far right); a twin-engine fighter (bottom left); a twin-engine fighter (bottom center); a twin-engine fighter (bottom right); a twin-engine fighter (bottom far right); a twin-engine fighter (bottom left); a twin-engine fighter (bottom center); a twin-engine fighter (bottom right); and a large four-engine bomber (bottom far right).

... and can you identify them?

Easy answer first: They are all equipped with Janitrol aircraft heaters—the most complete line of combustion type aircraft heaters, now so widely accepted as the safe, efficient, dependable means of aircraft heating. From their first pioneering days Janitrol combustion heaters, with the famous whirling flame principle, have given aircraft designers the utmost freedom in selecting the size, weight, shape, heating capacity, and desired controls for their exact requirements . . . A letter or phone call will put your nearest Janitrol aircraft representative at your service . . . NOW here's the answer to the second question.

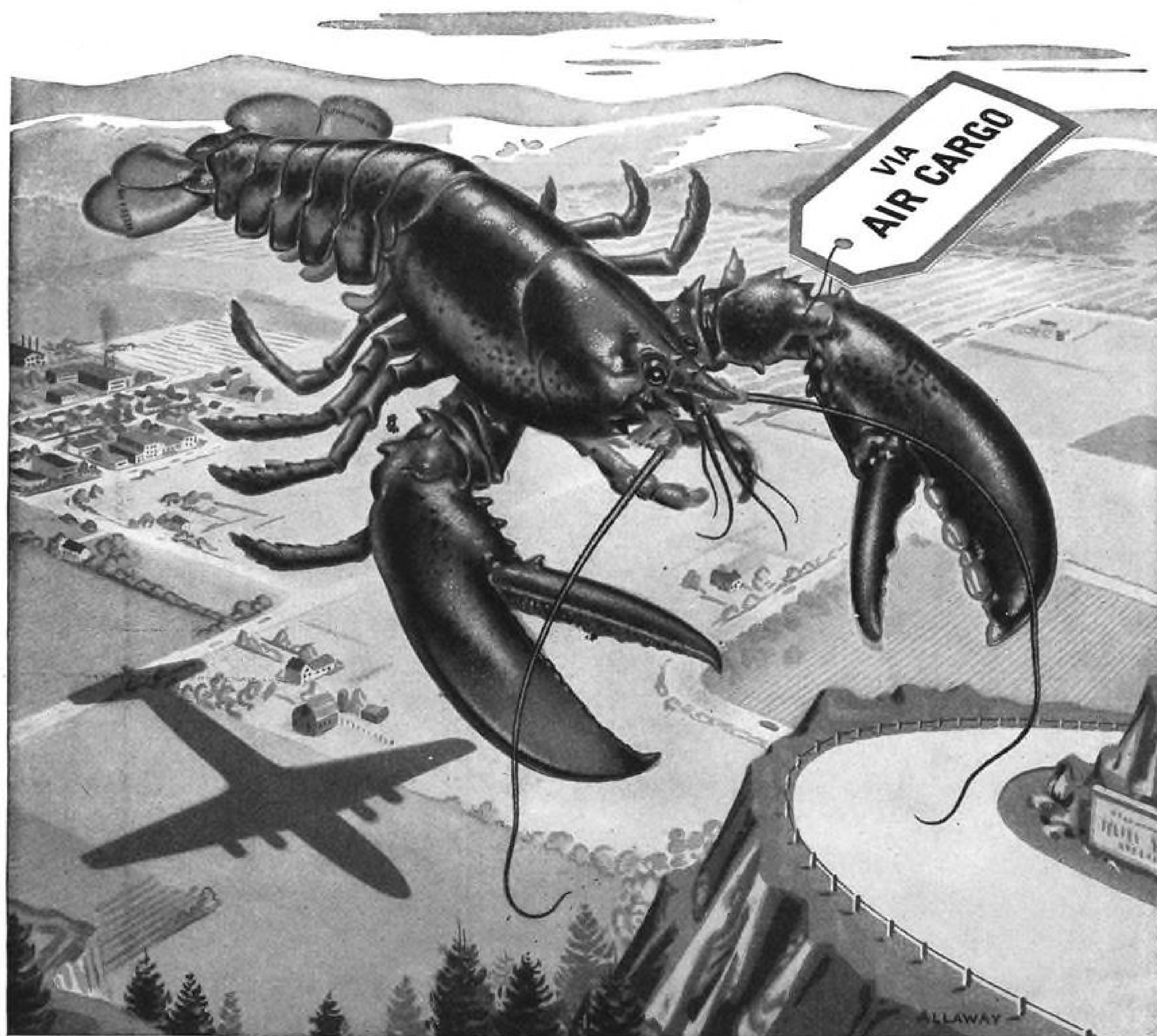
DC-3, TBM, JRM-1.
XF 12, P 51, DC-6, THIRD ROW: B-25, A-20, C-119, Mallard, BOTTOM ROW: F7F,
TOP ROW, left to right: Constellation, F4U, DC-4, C-46, SECOND ROW: SB2C,



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AVIATION WEEK, September 20, 1948

Vol. 49, No. 12

AVIATION WEEK

Sept. 20, 1948

Manufacturers Warned to Step Up Output

USAF gets release of funds for 500 more planes; even greater production needed.

By Robert Hotz

The aircraft industry felt increased pressure for greater production last week.

Following were significant developments:

- U.S. Air Force was well along on unfreezing an additional \$199,000,000 of its fiscal 1949 aircraft procurement funds for purchase of about 500 new planes in addition to the 2201 now on order.

- Top Pentagon Officials privately warned the aircraft industry to step up production and wipe out current deficiencies in military plane delivery schedules.

- Plans to begin production on the Boeing B-47, a six-jet, sweptwing bomber currently the fastest USAF bomber flying, were accelerated to put the plane in the fiscal 1949 procurement program.

- Preliminary discussions of the fiscal 1950 budget indicated increased appropriations for the USAF and a sizeable boost in aircraft procurement funds over the record peacetime peak of fiscal 1949.

USAF has already received approval from Defense Secretary Forrestal for allocation of \$103,000,000 in additional plane contracts. Routine Presidential approval of this fund was expected early next week. Another request to spend an additional \$96,000,000 (the balance of unexpended fiscal 1949 procurement funds) was moving through the new channels for approval required by the Armed Services Procurement Act of 1948.

The \$103,000,000 will buy:

- One hundred F-80C jet fighters from Lockheed Aircraft Corp. This brings the Lockheed F-80 backlog (including jet trainers) to about 800 planes.
- One hundred F-84F jet fighters from Republic Aviation Corp. Republic has received orders for 1100 F-84s including the 100, 300 of these have been delivered.

- Thirteen B-50C four engine bombers from Boeing Airplane Co. Total of 33 B-50Cs are now on order. Work



on prototype YB-50C equipped with Pratt & Whitney VDT engines is well advanced. Due to major differences between the B-50C and earlier B-50 types the production model designation will be changed soon to B-54. Boeing also has an Air Force experimental contract for the XB-55, a four engine turboprop bomber.

USAF's request for the \$103,000,000 was the first to go through the new channels required by law for aircraft procurement funds. Specific requests for use of procurement funds authorized by Congress by either the USAF or Navy now go to Defense Secretary Forrestal's office where they are routed to the Research and Development Board and the Munitions Board.

► **Modernity Studied**—Research and Development Board studies the proposed allocations to determine whether the equipment to be purchased is the latest and best available. After certifying technical approval RDB passes the program on to the Munitions Board which studies the aircraft industry's ability to handle the required production. After

Munitions Board approves the proposal goes to the Secretary of Defense for certification to the President that the equipment involved is necessary for the security of the country. Final approval comes from the President through the Budget Bureau.

This new procedure is necessary because the 1948 procurement act specified that the President must submit a quarterly report to Congress on progress of the aircraft procurement program and must certify that the equipment so ordered is required for national defense. Since presentation of a quarterly report on contracts already let would put the President in the position of merely rubber-stamping accomplished facts, the new procedure requires Presidential endorsement of all aircraft contracts before they are placed by the Air Force and Navy. Next quarterly report will cover expenditures to Sept. 30.

► **Seek More Funds**—Allocation of the remaining \$96,000,000 of USAF procurement funds for fiscal 1949 is still under study by the Research and Development Board. Allocation is expected to be returned to Secretary Forrestal in about two weeks for a final decision. With this money the USAF wants to begin production of the Boeing B-47 (AVIATION WEEK, April 17 and June 21, 1948).

An initial order of \$40,000,000 for 10 B-47s will be placed to get the production line at Boeing No. 2 plant at Wichita started. Preliminary work on this B-47 production line has been under way at Wichita for some time.

Air Force Secretary W. Stuart Symington had previously indicated the B-47 would not come into the production picture until fiscal 1950.

Other items to come out of the \$96,000,000 would include \$16,000,000 for production of guided missiles and \$40,000,000 for about 200 additional trainers, helicopters and utility planes. USAF has already allocated about \$40,000,000 for purchase of tooling required for high volume production and has \$344,000,000 still to be spent for a similar purpose.

► **Navy Plans**—Navy still has approximately \$100,000,000 in unallocated funds for aircraft procurements. Navy's request for additional expenditures is expected in Secretary Forrestal's office

From High-Speed Bombers to High-Speed Transports MARTIN LEADS THE WAY INTO THE FUTURE!



YESTERDAY: The famous Martin B-10 bomber, faster by 100 m.p.h. than any other bomber of its day and speedier than most pursuit ships, made obsolete nearly all the world's military aircraft; won the 1932 Collier Trophy for Glenn L. Martin.

TODAY: The Martin 2-O-2 as a military transport can carry 61 military personnel or more than 15,000 pounds of military cargo—over twice the capacity of twin-engine equipment used in World War II and still in service. And the 2-O-2 cruises at speeds 100 m.p.h. faster than the World War II planes it replaces... yet operates from the same short runways, small airports.

Tomorrow

Martin engineers are constantly at work harnessing higher and higher speeds to the transport and combat needs of our Military Services. In the days to come, look to Martin for rotary wing aircraft and other swiftly developing fields.

The Glenn L. Martin Co., Baltimore 3, Md.



Martin

AIRCRAFT

Builders of Dependable



Aircraft Since 1909

"FLAK BAIT," Devon Francis' new book, is the thrilling story of the heroic men who flew and serviced Martin B-26 Marauders in bomber strikes from the Southwest Pacific to the gates of Berlin. We are proud to be mentioned with these gallant men.

next week with final action due about Oct. 1.

Warnings that the aircraft industry must meet its delivery schedules were touched off early this summer in a blunt "off-the-record" speech by Air Force Secretary Symington to the Aircraft Industries Association board of governors at Williamsburg, Va. The speech was later printed in the Congressional Record. Strong Pentagon feeling on this stems from two facts:

1. That the rapidly deteriorating international situation requires a modernized Air Force in being rather than on the production line.
2. That it will be difficult to sell the 81st Congress on the second step in the five-year USAF expansion program unless the aircraft industry demonstrates that it can handle efficiently orders already on the books.

► **Industry Reaction**—First industry reaction to the pressure for maintaining delivery schedules came at Convair's Fort Worth plant where 7000 workers went on a 10-hour-day and six-day week to prevent B-36 deliveries from falling behind schedule.

Preliminary budget estimates for fiscal 1950, the first year the USAF will submit a separate budget, indicate a \$15,000,000,000 national defense budget with the USAF getting about \$6,000,000,000. Proposed aircraft procurement funds are about double the current \$1,937,000,000 allocation for new planes.

Navy Blimp Contract

A Navy design contract for the largest non-rigid airship ever built, awarded to Goodyear Aircraft Corp., Akron, Ohio, promises to be followed by a construction contract for at least a prototype of the new type N blimp.

Specifications call for a patrol airship with 825,000 cu. ft. capacity helium gas bag 324 ft. long, 71 ft. wide and 92 ft. high. An 87 ft. double-deck gondola under the envelope, would house crew of 14 officers and men, with additional relief crew living quarters on the lower deck away from engines and controls. A galley and mess equipped with electric range and refrigerator are included.

► **Big Gas Bag**—Gas envelope would have nearly twice the capacity of the K type blimps used in anti-submarine patrol during World War II and now widely used commercially after war surplus purchases, to display electric signs. This would give the N type nearly 100,000 cu. ft. gas capacity more than the Navy's M-1 Mighty Mike, believed the largest non-rigid airship built previously.

The Mighty Mike set a world record for continuous flight without refuelling two years ago, off Lakehurst, N. J. in an air cruise which lasted 170 hr. 17 min.



British DH-108 Hits Sonic Speed

U. S. observers emphasize difference between craft's dive performance and level flight mark of F-86A.

British press reports of supersonic speed attained in a dive by the D.H. 108 met a cool reception last week in the U. S., where the F-86A has exceeded the speed of sound in level flight.

John Derry, 27-year-old test pilot, reached an indicated Mach number 1.0 in a dive from 40,000 ft. in the swept-wing deHavilland D.H. 108 research plane.

The Machmeter reading was reached when the speed of sound is in the vicinity of 35,000 ft. represents about 663 mph. under standard conditions (—66.4 deg. F.).

► **No Match For X-1**—This performance is no match for the 700 mph. level flight at between 30-40,000 ft. of the swept-wing North American F-86A standard production Air Force fighter with full armament, or the Mach number 1.4 and 1100 mph. accomplishment of the straight-wing Bell X-1 rocket research airplane.

Flight began as a routine test of high speed handling characteristics the plane is undergoing for the Ministry of Supply. Derry began his dive at 40,000 ft. over Windsor, 30 miles west of London and began his pullout at about 30,000 ft. immediately after attaining the sonic performance. The dive took about one minute and the flight lasted about 35 minutes.

► **Pressure Waistcoat**—Derry wore a "pressure waistcoat" and oxygen mask, since the cabin is not pressurized. He reported immediately after the flight that he had experienced no unpleasant physical sensations. He did, however, reveal that the flight controls grew progressively "heavy" requiring strong exertion on his part to recover from the dive into level flight. He did not experience any loss of control or buffeting during the flight.

Derry revealed that he does not believe the airplane capable of sonic speed in level flight. It is powered by a deHavilland Goblin turbojet engine normally rated at 3300 lb. static thrust but especially modified to provide greater thrust for the tests. The airplane is the third in a series, the second of which took the life of Geoffrey deHavilland in September, 1946.

► **New Controls**—Derry's flight report may shed additional light on the cause of this tragedy since the second airplane did not have the power boosted controls fitted to the third airplane. This lack of boost plus Derry's report of high stick forces point towards probable cause of the accident.

The D.H. 108 was originally built to test the basic design of the swept-wing, jet-powered deHavilland D.H. 106 (Comet) transport, nearing completion and slated to fly late this year. The first D.H. 108 was assembled from a D.H. Vampire jet fighter fuselage and power plant plus swept wing panels and a high vertical swept tail.

► **Second Lost**—It was a low-speed model used to determine stability and control of the layout. The second airplane was lost in the Thames crash. The third airplane was strengthened and featured redesigned air intakes, canopy and vertical tail configurations. It holds the world's 100-kilometer speed record of 605.23 mph. set last April 12.

Although Derry's report was based on the indicator reading of his Machmeter, the airplane carried an automatic flight recorder containing airspeed, altitude and temperature data on the basis of which exact speed will be determined.

The Ministry of Supply announced that the flight would have no effect on its research program through the transonic region.



HAWKER'S Nene-powered fighter, N. 7/46, Navy version of the RAF P. 1040.

Britain Reveals New Plane Types

Aircraft manufacturers' annual exhibition shows 40 models for the first time, including latest jet fighter.

(McGraw-Hill World News)

FARNBOROUGH, England — Engines for tomorrow's planes, if not the shapes of things to come, were on parade for the world's buyers here this week as Britain's aircraft industry in conjunction with the Ministry of Supply, pulled up the blinds on the biggest window-display of planes and power plants ever assembled.

The occasion: the ninth annual exhibition and flying display of the Society of British Aircraft Constructors.

A record attendance of some 7000 trade representatives from 69 countries, including Americans, watched Britain's ace test pilots put more than 50 of the latest British-built fighters, bombers, training planes and transports through their paces.

They also scrutinized carefully the same planes and some 20-odd other new types parked in the static display. More than 40 planes were being exhibited publicly for the first time, although details of a good many of them have been disclosed from time to time.

British sales of aircraft and engines to other countries, now a major contributor to the nation's export drive, will get an added boost from the show. This year's record level—£16 million for the first seven months—is already well ahead of last year's £24 million total; and what is of equal importance, nearly one-third of current aircraft exports are to hard-currency countries. Before the

war (1938) exports totaled a scant £5½ million.

This year for the first time the exhibition was open to the public—on Saturday and Sunday, Sept. 11 and 12, after four days when admission was limited to the trade.

Progress in airframe design was not so strikingly evident in the exhibits this year, largely because the truly advanced design projects are still under security wraps.

► **New Turbo-Jet**—The Avon Rolls-Royce's new axial-flow turbojet engine was on view. It was displayed in a Merlin-powered Lancastrian with two Avons fitted in the outboard nacelles.

► **All-Jet Airliners**—AVRO's Tudor VIII, powered by four Rolls-Royce Nene turbojets paired in two smoothly faired nacelles slung under the wing, made its first flight Sept. 6, just the day before the show opened.

The Tudor VIII, the world's first four-jet transport plane, like Vickers-Armstrong's Viking powered by two Nenes (which flew some time ago and was also on exhibit), is purely an experimental project for the Ministry of Supply. Both craft are greatly overpowered for the strength of their airframe but they are useful in conducting research into the problems of transport planes intended to fly at high altitudes.

► **Jet Fighters**—The new RAF and Naval fighter, Hawker's P.1040 and N.7/46 (two versions of the same airframe), powered by a single Rolls-Royce

Nene with a novel divided air inlet and exhaust outlet, gave what was probably the classiest flying exhibition.

Saunders-Roe's SRA.1 flying-boat fighter, which is powered by two Metro-Vick axial-flow Beryl turbojets, also was on view. It showed a maneuverability and a performance at well over 500 mph. that belied its slightly heavier construction.

► **Tailless-Jets**—Armstrong-Whitworth's A.W.52 showed observers how Britain is tackling the problems of air-flow and boundary-layer control on very thin sweptback wings. An earlier all-wing, powered by two Nenes, has been flying for some months; the second version, just completed, is fitted with two Rolls-Royce Derwent turbojets, which are smaller in diameter and permit an almost unbroken air-foil.

De Havilland's Goblin-powered swept-back wing D.H.108 was not present when the show opened, being detained at Hatfield for high-speed trials, but was shown to the public at the close of the show.

► **Turboprop Developments**—Vickers-Armstrong's Viscount, powered by four Rolls-Royce Darts, had undisputed sway as the world's first multi-turboprop airliner, as Armstrong-Whitworth's Apollo just missed being completed in time for the show. This is the first installation of the Dart, which has been brought along slowly and is still in the "experimental" stage, particularly as to the solution of cooling problems.

To enable fighter-pilots to make the transition to high-speed jet-powered fighters, Britain has felt the need for an intermediate trainer, and two different answers to the specification were on show: Boulton-Paul's Balliol, the first to fly, and Avro's Athena. Both are powered with Armstrong-Siddeley's Mamba

turboprop. Some of the bloom was taken off these projects by the presence of variants of each, both powered by Rolls-Royce Merlin piston-engines. And it is these latter versions that have been given the initial production orders. In flight (perhaps because of the cautious handling given the turboprops) there was little to choose between piston-prop and turboprop types, except for quieter performance of the turboprops.

► **Coming Engines**—Coming along rapidly are more powerful turboprop designs which were on exhibit: the Napier Naiad, with 1500-shaft horsepower; the Bristol Theseus, with 2200 hp., and Proteus, with 3200 hp.; and the Armstrong-Siddeley Python, with 3670 hp.

The Naiad has been considered as a replacement power plant for the Airspeed Ambassador short-range transport; the Theseus is already designated for the Handley-Page Hermes V; and the Proteus is scheduled to power both the second prototype of the giant Bristol Brabazon and all of the Saunders-Roe SR45 flying boats.

The Naiad and Theseus were flown in front of the crowd at the exhibit in their respective flying test-beds (the nose of a Lincoln, and the two outboard nacelles of another Lincoln); the Python is also installed in the outboard nacelles of a Lancaster, but is currently undergoing stationary trials at the factory and was not on hand at Farnborough.

► **Other Types**—Among other types: • Handley-Page Hermes IV, medium-range civil transport, powered with four Bristol Hercules 763 radial piston-engines and with a pressurized cabin for a maximum of 63 passengers. Major change from the Hermes II prototype, shown last year, was the incorporation of a tricycle landing gear.

• Cierva showed two new helicopters: the "Air Horse", designed to carry 24 passengers or 3-4 tons of cargo, and with three rotors driven through a central gear-box by a single Rolls-Royce Merlin; and a very light two-place Skeeter, powered by a 100-hp. Jameson engine.

• Auster contributed the only new conventional light-plane designs: the A.2/45, an air observation post plane, and the Auster 7 dual-trainer.

AA, UAL Follow Suit

Competitive pressures drew American Airlines and United Air Lines passenger fares together last week. United followed American's lead in eliminating the 10 percent premium on DC-6 fares, while American fell in line with other carriers by adopting a 5 percent discount on roundtrips, exclusive of flights made under the family fare plan. AA's unique family plan permits wives and children under 21 accompanied by full-paying passengers to travel at half fare if their flight starts between Monday and Wednesday.



AUSTER'S air observation post plane, A. 2/45.



AVRO'S Tudor VIII, four-jet transport.



CIERVA'S three-rotor Air Horse.



HANDLEY-PAGE Hermes IV.

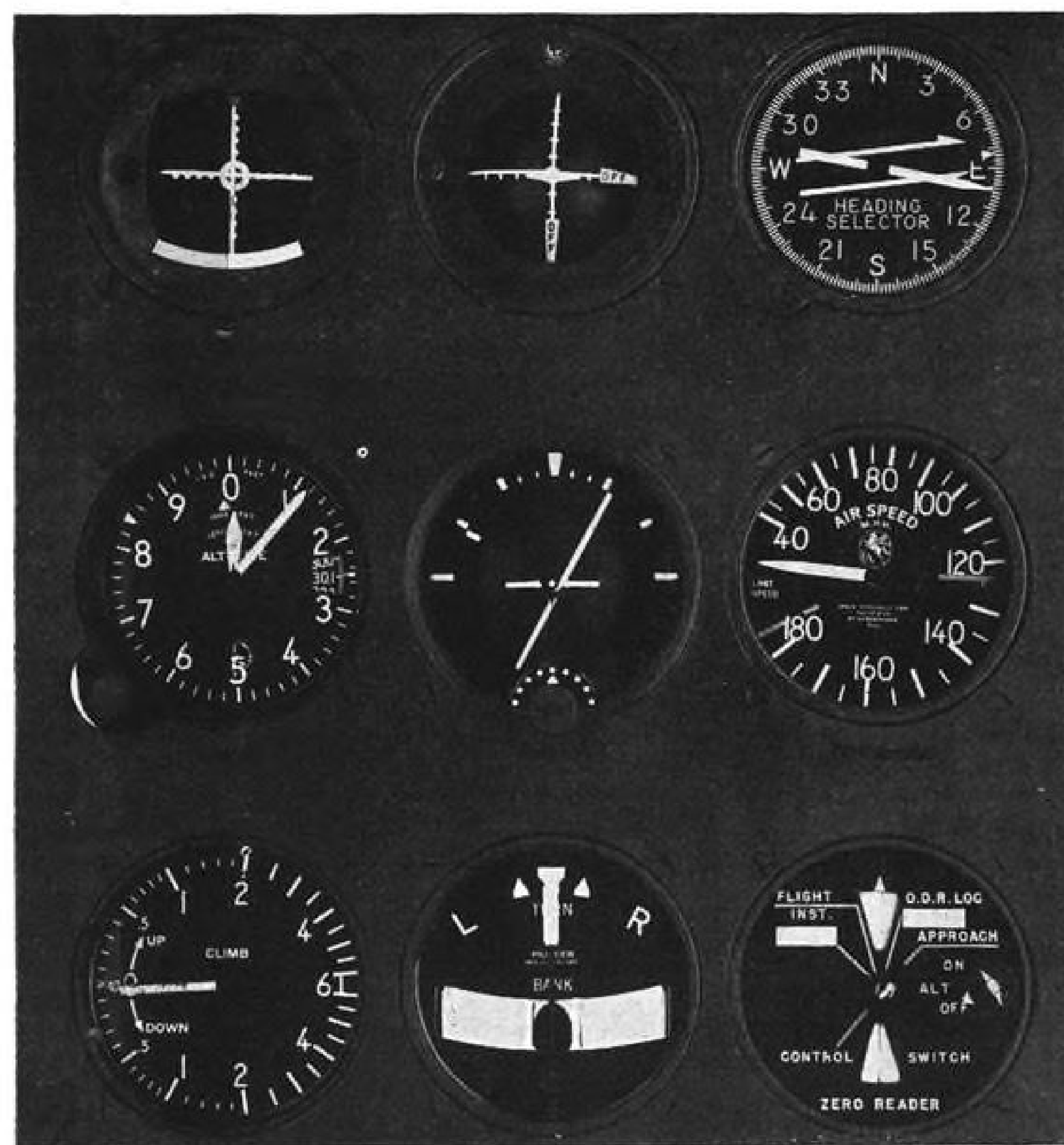


Photo shows how the Sperry Zero Reader looks to a pilot. The instrument panel grouping has the Zero Reader Indicator in the top row center with the ILS cross pointer indicator on the left and the heading selector for the Zero Reader on the right. Second row has standard altimeter

geared for altitude control, flight indicator and air speed dial. Bottom row has rate of climb indicator, bank and turn instrument and control switch for Zero Reader. Pilot uses only Zero Reader Indicator in top row center while flying under instrument conditions.

New Flight Indicator Introduced

Sperry develops Zero Reader to make instrument flying simpler and ILS approaches more accurate.

A new flight instrument designed to simplify flying under instrument conditions and improve accuracy of ILS approaches has been announced by Sperry Gyroscope Corp.

Called the Zero Reader, the instrument is a cross-pointer cockpit indicator which correlates attitude, altitude and heading information for an aircraft in flight. Result is that when the desired flight path is being flown cross-pointers are zeroed on dead center.

► **Ready for Production**—The Zero Reader has been under development by Sperry for about eight years. Recently a development model was flown in the Air Transport Association's research plane Beta on a tour during which chief pilots of major airlines and Civil Aeronautics Administration officials flew the Zero Reader on ILS approaches and during cross-country

The Zero Reader consists of a cockpit indicator, a heading selector, a switch and an amplifier. The cockpit indicator has two cross pointers that are always perpendicular to each other, a substantial improvement over the ILS indicators in which cross-pointer angles vary. The heading selector is for the purpose of setting the desired course. A compass needle within the selector indicates the course actually being flown.

► **Amplifier Brain**—The switch provides for using either altitude control for cross-country flight which is determined by pre-setting the altimeter to the desired altitude, or for using an ILS system. Two positions are provided for the ILS making it possible to use the localizer back course for outbound flight as well as the standard course for approaches.

Flight tests with the Zero Reader indicate that manual ILS approaches can be made with greater accuracy than is possible with the standard ILS cockpit indicators. It simplifies "missed approach" procedures and eliminates the annoying transition from regular flight instruments during cross-country IFR flight to the cross pointer type of approach instrument. Both types of instrument flying can be done with the Zero Reader.

Sperry emphasizes that the Zero Reader is not intended to be a primary flight instrument and is no substitute for primary instruments. Rather it is intended to simplify the job of using primary instruments while retaining the primary instruments as a double-check on the Zero Reader. Engineering details and flight tests of the Zero Reader will be discussed in a forthcoming issue of AVIATION WEEK.

Blade Explosion Blasts Wind Tunnel

Explosive failure of one or more blades destroyed all 32 blades of the \$2,500,000 Southern California Cooperative Wind Tunnel during a high-speed run Sept. 13.

Buildings and homes within a radius of one block were jolted as if by an earthquake when the blades failed.

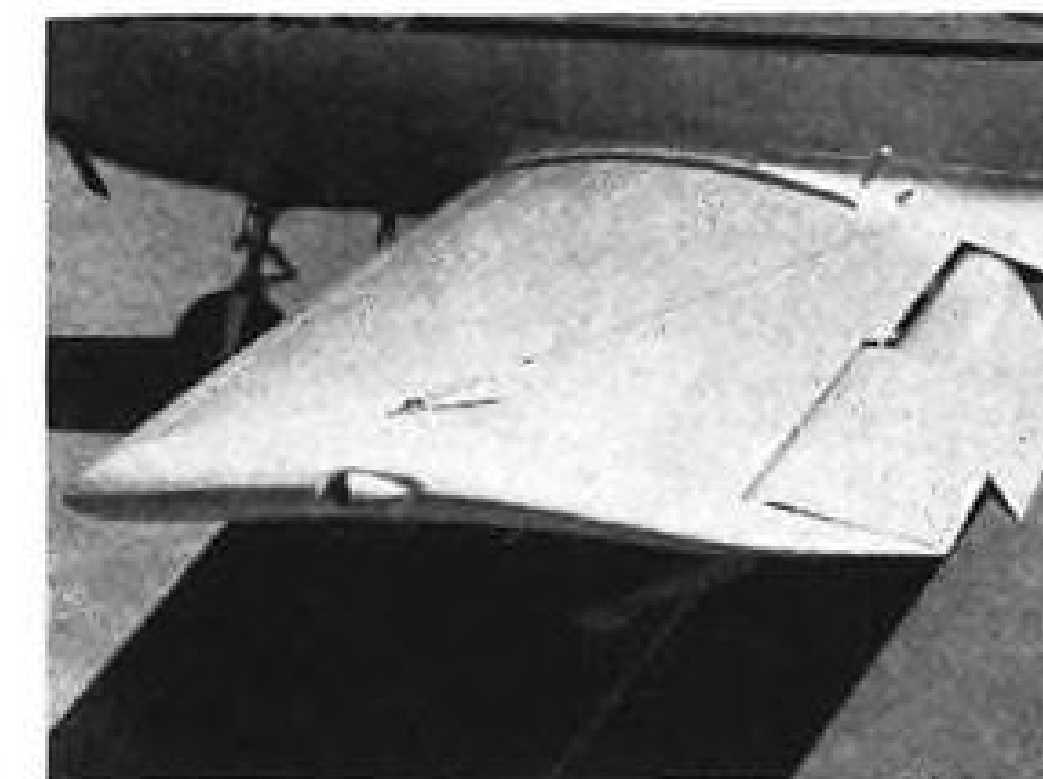
► **Damage Limited**—Although the Pasadena, Calif., tunnel bounced severely, damage was limited to loss of blades, denting of tunnel walls and turning vanes in the fan area, and probably misalignment of the model floating support system.

Dr. Josiah Smith, assistant director of the tunnel, told AVIATION WEEK that repairs can be completed in two months. He said that the Cornell University sister tunnel at Buffalo, N. Y., may be drafted to run tests for the West Coast industry during the repair period.

CHECK THESE NAVION FEATURES



1 SELECTIVE TWO-CONTROL gives automatic coordination. Patented inter-connected aileron and rudder control permits steering with wheel alone. But you have rudder when you want it. Navion flying is easier, safer...pleasantly relaxing.



2 HIGH-LIFT FLAPS. Large, slotted, full-deflection flaps give the Navion slowest, shortest landings of any plane in its class. Roll only 335 feet. Stall-resistant wing gives full aileron control for maximum safety in slow flight and landings.



3 FULL-VISION CABIN. Here's visibility designed for Sunday traffic. Seven large, clear windows let you see in every direction. No blind spots while flying or taxiing. You can even use a rear-view mirror...see 12° down over Navion nose.



4 THICK-SKINNED RUGGEDNESS. The all-metal Navion takes heavy duty assignments in stride. Sturdy construction and thick-skinned wings, fuselage and tail assure safety and low maintenance cost. For permanent beauty, durable enamel finishes now standard...choice of 4 striking colors.



5 LARGE, STEERABLE NOSEWHEEL. Easiest, safest ground handling under all conditions. Navion's over-size tires, sturdy tricycle landing gear, wide wheel tread and high speed ground clearance make rough fields and cross-wind landings a cinch. Extra powerful, equalized hydraulic brakes.



6 ROOMIEST CABIN. Quiet...well-ventilated...smartly styled. Elbow and leg room to spare for all four passengers. Adjustable front seats. Navion cabin, 42" wide; 94" long; 52" high. Canopy rolls open 2½ feet for more convenient entrance and exit. Baggage space up to 180 pounds.

7 FLEXIBILITY OF PERFORMANCE. 150 mph. cruising speed. 750 mile range with optional reserve tank. Easiest air ride. No tail wagging, even in rough air. No other plane offers such intelligently chosen and well engineered combination of features. For illustrated booklet, demonstration or free business trip, write us today, on your business letterhead!



The Thoroughly Proven Post-War Plane *Ryan Navion*
Rely on Ryan RYAN AERONAUTICAL COMPANY, 409 LINDBERGH FIELD, SAN DIEGO 12, CALIF.

Strike Ends

Boeing workers return, but jurisdictional dispute may be in offing.

Striking workers of the Aeronautical Mechanics Union went back to work last week at the Seattle, Wash., plant of Boeing Airplane Co., but the company's labor troubles may not be ended.

While the AMU workers were away, the A. F. of L. Teamsters' Union moved in to organize eligible Boeing employees on the basis that the employees were not represented by any union. That wasn't too great a worry to AMU, an affiliate of the independent International Association of Machinists, as there weren't too many Boeing workers eligible for Teamster membership. But that is all changed.

► **New Union**—Daniel J. Tobin, grand president of the Teamsters, has authorized a new Seattle local, the Aeronautical Workers, Warehousemen and Helpers. And the new group is out to organize all Boeing hourly workers, in direct conflict with AMU.

Immediate result was that the Aero Mechanics hurried back to work on Sept. 13 after being out 140 days. The new union was one reason for the return. Others: IAM worry over cost of strike benefits, more than \$2,000,000; defection of about one-third of AMU's original 14,000 members.

But another result may be jurisdictional trouble at Boeing as the Teamsters' local and the AMU scurry to strengthen membership. Dave Beck, Teamsters' West Coast boss, says "Our plans would change only if the Aero Mechanics returned to the A. F. of L." ► **Terms** — Boeing announced it would rehire all 8700 employees who have submitted reinstatement applications, except 39 it has branded "subversive." Rehiring will be gradual, depending upon work progress from the primary shops into the assembly shops, and thus may be expected to extend over a period at least of weeks and perhaps of months.

The workers go back to work under Paragraph 2 (B) of an NLRB trial examiner's recommendation which called upon the company to return all strikers to their old or equivalent positions with no loss of rights, upon application by the strikers for re-instatement.

The company has hired some 8000 workers to replace strikers and has announced they will continue on the payroll. With its agreement to reinstate the strikers, it is committing itself to a larger payroll than it has announced as necessary. But Boeing has declared it is willing to maintain a larger force until normal attrition reduces the total number of employees.

The strikers return to work with a 15-cent-an-hour wage increase which the company originally had offered, but without a contract. Settlement of the unfair labor practice charge and decision as to which union is the proper collective bargaining agent are up to NLRB.

Airport Ratings

Improved airport services to the private flyer are indicated in the latest airport survey by members of the Aircraft Owners and Pilots Association. A total of 717 airports are now holders of the AOPA "above average" and "superior" ratings. The higher rating, "superior", showed an increase from 64 at the last rating to 128 as of July 31, date of the latest reports.

The ratings are based on detailed reports filed by individual AOPA members, and indicate that only one airport in about nine of the total in the country (6218) meets the private flyer requirements.

J. B. Hartranft, Jr., AOPA general manager, reports that the survey has made his members increasingly conscious of good and bad airport service, with the result that pilots are going out of their way to stop at airports where service is good. As indication that improved service benefits the operator, he cites the fact that 611 of the 717 airports which received ratings this time, had either retained or improved their last ratings, showing operators interests in maintaining standards.

Revised CAA Soon

After three months of study since he took office June 2, Delos Wilson Rentzel, CAA administrator, last week had a new revised organization chart just about completed for his agency. Last preliminary step before putting his reorganization into effect was to call a meeting of the administrators of the nine CAA regions and top subordinate personnel from the regions and Washington, for a final review of the CAA status quo.

One plan reported under consideration called for reduction in the number of CAA regions, which would entail considerable shifting of personnel and elimination of some posts. Other plans called for transfers and readjustments of several Washington top personnel.

Key to the Rentzel plans for CAA may be his previously expressed admiration for the frequent interchange of personnel between industry and government found in the Federal Communications Commission. He has expressed a desire for more "new blood" from industry in CAA so that the agency will be in closer touch with the industry it is trying to encourage and regulate.

End in Sight?

Maguire effects exploratory talks between Port Authority and airlines.

New York's version of the Hatfield-McCoy feud, with the Port Authority and nine major airlines in title roles, may be over soon.

When it is—and there are still some observers who feel the controversy is no where near ending—a finis will be written to a series of hurly-burly arguments over landing fees, leases, rights and privileges, spiced with airline irascibility over charges to their employees for toilet use.

The Port Authority, now meeting directly with airline representatives in exploratory conferences, is still not fully recovered from the blast it received from Edward C. Maguire, New York commerce commissioner who was appointed by Mayor O'Dwyer to effect a meeting.

In a letter to the Mayor, Maguire said that, in his opinion, the airlines were not exaggerating the danger of the situation. He was referring to an airline claim that the Port Authority was vexing the airlines "beyond endurance" and creating a situation which would harm New York business and employment opportunities in more fields than aviation.

What the airlines charge is this: The Port Authority stated when it took control of the airports that leases signed in 1945 between the city and the airlines for use of Idlewild are still valid. In addition, they claim the Authority has been forcing foreign flag carriers to move from LaGuardia Field to New York International.

The Port Authority counters: The leases were signed three years ago. They are outmoded and unworkable. For safety reasons, the Authority claims, it has asked certain airlines to move from LaGuardia to Idlewild.

The airlines also are concerned over the Authority's policy of issuing temporary permits for airport space revocable on 30 days' notice. If the Authority relents on this one, observers think the airlines will consider accepting the Authority-proposed higher rates for leases.

Stratocruisers for Airlines

Fifty-five Boeing Stratocruisers, 80-passenger transports awarded an approved type certificate by CAA this month, are on order by six airlines: Pan American Airways, Scandinavian Airlines System, Northwest Airlines, American Overseas Airlines, United Air Lines and BOAC.



**SIGN OF
QUALITY AT
OVER 1,000
U.S. AIRPORTS**



The Flying Red Horse!

You'll find this world-famous sign at more airports than any other oil company's trademark! All over the United States, important, strategically located airfields put Socony-Vacuum products always within cruising range.

Why does the aviation industry have such confidence in the Flying Red Horse? It's the trademark of Socony-Vacuum, famous pioneer in aviation fuels and lubricants. It pioneered the Houdry Process of

Catalytic Cracking, the TCC Process for continuous refining, the sensational "Magic Bead" Catalyst—helped revolutionize flying safety and performance!

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Today, with 82 years' progress in petroleum behind it, Socony-Vacuum has its scientists working on future developments—studying new fuels and lubricants for supersonic jet planes, rockets and the peacetime uses of atomic energy.

SERVES EVERY BRANCH OF AMERICA'S AIR INDUSTRY!

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AIRPORT LIGHTING ENGINEERED BY L-M

L-M Airport Lighting is designed by airport lighting engineers, who also engineer the installations. L-M offers complete equipment for the largest airports; and specialized "package" lighting for smaller airports at a cost for equipment of only \$1 per runway-foot. All meet CAA specifications.

**L-M-Bartow High Intensity
Runway Lights**
up to 180,000 beam candlepower

**Medium Intensity
Elevated Runway Lights**
for secondary
runways and
taxiways at
large ports;
main runways
of smaller fields.

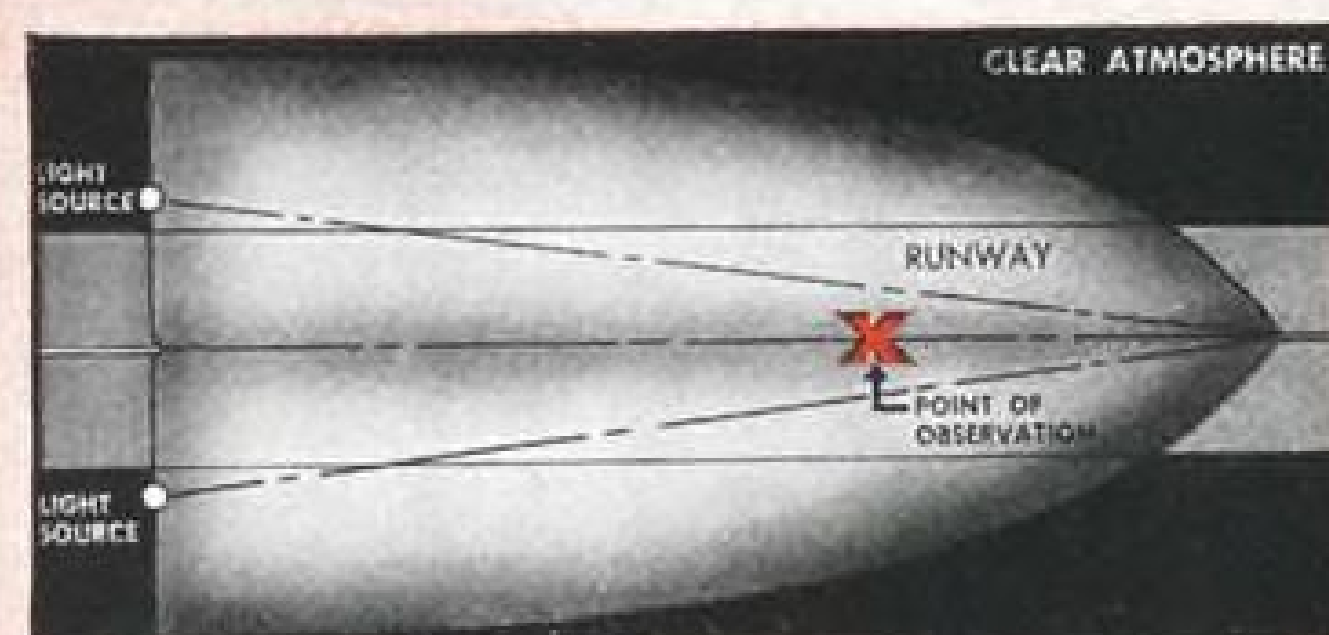
Rotating Beacons
Two sizes—
1000 watt, 325
watt sealed
beam type; for
largest and
smallest fields.

Obstruction and Marker Lights
Control Panel and Power Units
include all switches, selec-
tors, intensity and beam con-
trol, breakers, fuses, etc. for
entire system. Also trans-
formers, cable, fuse cutouts
and other required equip-
ment.

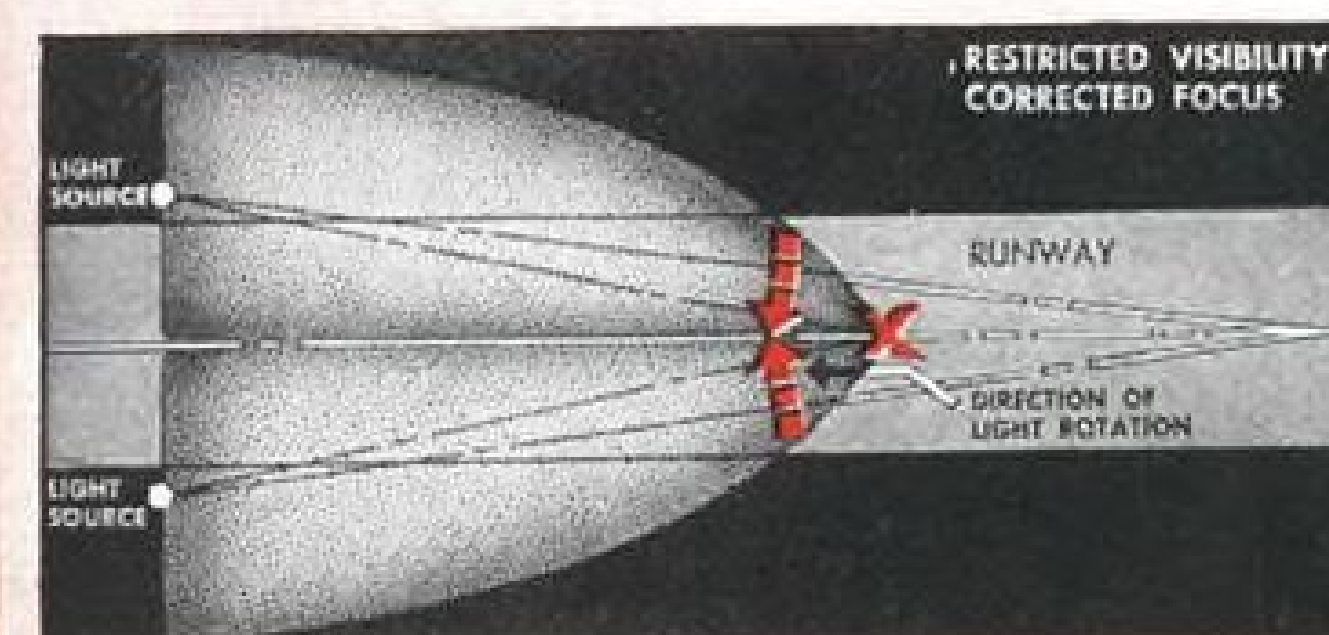
APPROACH LIGHTING

L-M-Bartow approach lighting is now being rigorously and extensively tested under ANC supervision. Like all L-M-Bartow equipment, it will not be announced or offered until fully approved. For the basic principles, see pages 18 and 19 of brochure described at right.

Only the fully controllable beam of L-M-BARTOW approach and runway lighting permits the very high intensity of 180,000 beam candlepower



In clear weather, intensity can be reduced; lights are aimed to meet at a distant point. (Angles are exaggerated to simplify the diagrams.) All lights appear of approximately equal intensity to the pilot.



With lowered visibility, intensity of the lights must be increased; beam direction is corrected (red arrows), securing maximum possible penetration. And there is no glare, even at maximum beam candlepower!

Brings them in all over the world

L-M-Bartow pioneered high intensity lighting and is today's leader, both in quality and in number of installations in operation or being installed—at Boston, Chicago, LaGuardia, N. Y. International, Newark, Minneapolis-St. Paul, Raleigh-Durham, St. Louis, Salt Lake City, Worcester, and others. Many foreign installations, including Dublin, Shannon, Brussels, Hankow, Canton, Lunghwa, Caracas, Panama, and dozens of army and navy fields.

How it Works

Both intensity and beam direction are automatically controlled from the tower. When visibility decreases, the light intensity is raised and the lights are "coned in" to the correct angle of maximum penetration. As the pilot picks up the beam of the first lights, he sees them at maximum, glareless intensity; as he comes nearer, he is at a different angle to the beam pattern and the optical system reduces the intensity so that the lights appear no brighter than when he first saw them. The L-M-BARTOW system—and only the L-M-BARTOW system—makes it possible to use the extremely high beam intensity of 180,000 cp. without glare, to reach out farther and "bring 'em in alive" when every foot of distance counts.

Write for this brochure

"The Lights that Bring Them In" explains the principles of runway lighting in illustrations, charts—it's worth reading. If you haven't a copy, write **Line Material Co., Airport Lighting Division, East Stroudsburg, Penn.**



PRODUCTION

Military Orders Boon to Lockheed

First-half net profit runs to more than \$5 million; procurement billings comprise 71% of total sales.

The semi-annual report recently released by Lockheed Aircraft Corp. reveals the initial impact of aircraft procurement.

A net profit of \$5,310,151 or \$4.93 per share was reported for the first six months of this year compared with a net loss of \$4,890,694 for the same period a year ago. Current earnings allow \$2 million for profit limitations on government contracts.

► **Two Reasons**—Improved operating results are traced to two factors: (1) continuous production, making increased efficiency possible which in turn brought about lower costs and higher earnings; and (2) a carry-forward credit against \$7 million of income as a result of the current provisions of the revenue act, giving Lockheed a tax saving of some \$2.8 million.

However, a caution against expecting the same rate of earnings to continue during the second half is indicated. Complete liquidation of the carry-forward tax credit will subject all of the company's income to federal taxes. Higher labor costs due to recent wage increases will add to operating expenses. Also, new contracts received after May 21, 1948, are subject to profit limitations imposed by the Renegotiation Act of 1948.

► **Change**—Total sales for the first six months of this year increased to \$65,981,050 with \$46,563,685 or about 71 percent represented by military billings. The change in the character of orders is shown in the June 30, 1948, backlog, amounting to \$196,421,000, of which about 95 percent comprises orders from the military services.

Subsequent to June 30, 1948, Lockheed received an order for five additional Constellations from Eastern Air Lines in the amount of \$6,250,000. This brought the total to ten Constellations under construction for the commercial airlines in addition to the ten now being built for the Air Force.

► **Current Rates** — Military contracts cover 656 Shooting Stars (F-80C), 156 Shooting Star Trainers (TF-80C), 143 Neptune patrol planes (P2V) and two Constitutions.

Production of Shooting Stars at current delivery rates is expected to continue until the early months of 1950,

unless modified for the convenience of the government. An important change in the international scene could have an immediate effect on the entire aircraft program, either up or down. ► **Loans Reduced**—Substantial improvement was shown in Lockheed's financial picture. The \$40 million in bank loans as of June 30, 1948, was reduced to \$11.5 million June 30, 1948. Only about \$165,000 of a revolving bank credit remains unpaid, and \$2 million due in January, 1949, on the term loan has been anticipated, leaving total current borrowings at slightly more than \$6 million. The term bank loans are due in aggregate amounts of \$2 million on Jan. 15, 1950, and 1951, and July 15, 1951.

However, Lockheed remains contingently liable for \$12,501,693 of bank loans, formerly its direct obligation. In selling twelve Constellations to TWA, Lockheed accepted in payment the carrier's notes in that amount. Lockheed discounted the paper with a group of

commercial banks. TWA has promised to liquidate this specific obligation in 57 equal monthly payments starting on Sept. 30, 1948.

► **Same Mortgage** — Curtiss-Wright is also holding TWA notes under the same chattel mortgage agreement in payment for Wright engines used in the Constellations. On July 31, 1948, the total TWA obligation to both Lockheed and Curtiss-Wright under the terms of this agreement came to \$16,031,439.

In addition to the TWA notes, Lockheed, as of June 30, 1948, guaranteed customers' notes in the amount of \$3,728,000. At the present time, \$800,000 of these notes have been paid off. The unpaid balance is for the account of a foreign airline.

► **No Diversification**—Lockheed's investment in Pacific Finance Corp. continues to be profitable. As of June 30, 1948, Lockheed owned 294,537 shares of this credit company, a 53.69 percent voting control. Carried on Lockheed's books at a cost of \$5,039,389, this investment represents an equity of \$6,083,509 in Pacific Finance's net assets, which is \$1,044,120 in excess of cost.

An additional 16,000 shares of Pacific Finance were acquired recently by Lockheed at a private sale at a cost of \$328,000 or around \$20 per share. It is believed that this Lockheed holding is merely an investment and a source of secondary cash, that it is not indicative of a diversification in the company's activities.



AT GUIDED MISSILE SYMPOSIUM

Nearly 100 guided missile authorities visited Seattle early this month to attend symposium at Boeing Airplane Co. sponsored by the Range Instrumentation Panel of the Research and Development Board. Sessions were closed because of the confidential nature of guided missile research. Some of those who attended were left to right: C. E.

Mattox, Signal Corps, Engineering Laboratories; Richard Nelson, Boeing; Dr. W. H. Pickering, California Institute of Technology; Lt. Col. J. A. White, secretary of the symposium; Col. G. H. Stubbs, White Sands Proving Grounds; Col. P. F. Helmick, Holloman Air Force Base, and Col. R. H. Curtis, USAF.

LINE MATERIAL Airport Lighting



Key Employment in Aircraft Centers

EMPLOYMENT

Area	Aircraft		Other Key Industry Jan. 1948
	July 1944	Jan. 1948	
Bridgeport, Conn.	16,800	10,000	39,400
Hartford, Conn.	37,000	16,100	28,000
Buffalo, N. Y.	89,000	2,100	110,000
New York, N. Y.	65,500	10,000	270,000
Paterson, N. J.	63,300	11,300	38,400
Newark, N. J.	28,000	7,400	228,100
Philadelphia, Pa.	45,400	7,000	248,300
Baltimore, Md.	42,200	10,600	92,700
Detroit, Mich.	355,000	5,100	406,000
Flint, Mich.	33,000	0	55,000
Akron, Ohio	26,100	3,400	23,000
Cincinnati, Ohio	43,000	1,500	63,000
Cleveland, Ohio	43,500	1,000	200,600
Columbus, Ohio	26,000	4,000	27,400
Chicago, Ill.	82,000	3,000	403,000
Evansville, Ind.	20,000	0	22,500
Indianapolis, Ind.	32,000	6,400	46,200
South Bend, Ind.	20,000	0	31,000
Atlanta, Ga.	25,600	0	14,000
Kansas City, Kans.-Mo.	48,300	1	30,000
Wichita, Kans.	45,200	5,100	5,800
St. Louis, Mo.	17,800	3,400	120,500
Oklahoma City, Okla.	22,700	1	10,000
Tulsa, Okla.	22,000	1	10,000
Dallas, Tex.	43,900	1,900	15,000
Fort Worth, Tex.	23,700	12,000	3,600
Los Angeles, Calif.	219,100	66,300	157,700
San Diego, Calif.	52,000	14,000	3,500
Seattle, Wash.	41,000	17,400	24,100

Estimates based on U. S. Employment Service employer and area reports.
Areas listed employed 15,000 or more aircraft workers in 1944.

Other key industries include mining, chemicals, petroleum, primary and fabricated metals, machinery, and other transportation equipment.

¹ Less than 5,000.

In tight labor supply areas, the expanding aircraft industry will have to rely largely on drawing qualified workers from other key industries in the same areas to meet their labor needs.

This is the view of the U. S. Employment Service, which points out that there is little labor surplus in the Great Lakes and Middle Atlantic aircraft centers and that many of the few unemployed are "probably not occupationally suitable."

The aircraft manufacturers must woo workers from other industries in the same general locality, USES asserts, because adjustment of the labor supply through migration will be difficult due to the general shortage of housing and other community facilities.

Shortages will not be uniform,

according to USES, but will vary from area to area depending on the volume, occupational skills and the timing of employment expansion required in a given area, the local labor market situation and the competition from other industries for labor in the same area.

A survey of 29 aircraft centers where at least 15,000 aircraft workers were employed in 1944 has been completed by USES, comparing in each area the aircraft employment at the peak of the war (July, 1944) with the employment, as of last January, in aircraft and in key industries which compete with aircraft for labor. The key industries include mining, chemicals, petroleum, primary and fabricated metals, and all machinery and transportation equipment (except aircraft).

See table for comparison.

Lightplanes Show Decline in Exports

Exports of personal planes dropped in July from what they had been in June but were over the 1947 average.

Report by Aircraft Industries Association shows 153 aircraft, four-place and under, valued at \$410,125, exported by twelve companies in July. This is 16.6 percent of the total number produced by the companies and 12.7 percent of dollar value.

► **Comparison**—June exports totaled 188 planes, 20.5 percent of numerical production. Their \$550,150 value was 15.5 percent of total output. Average number of such planes exported monthly in 1947 was 139.

Totals for the first seven months of 1948 were brought by the July exports to 686 aircraft valued at \$2,470,677.

Personal plane companies reporting were Aeronca, Beech, Bellanca, Cessna, Engineering & Research, Fairchild, Luscombe, Piper, Ryan, Stinson Division of Consolidated Vultee, Taylorcraft and TEMCO.

Largest share of the total—102 planes—went to Argentina. Other countries: Uruguay, 9; South Africa, 8; Mexico, 7; France, 6; India, 5; Colombia, 4; Brazil and Canada, 3 each; Switzerland, 2; Belgium, Cuba, Guatemala and Indo China, 1 each. In addition, Alaska took 4 valued at \$8617.

Ryan Steps Up Schedule

Ryan Aeronautical Co., San Diego, has increased its production schedule following strike difficulties that cut its Navion deliveries in July to 19. A rate of four Navions every working day was set in the latter part of August and is to continue "at least through late autumn." Sixty-one Navions were delivered last month. June figure was 71.

Earl D. Pruden, vice president, reported Navion firm orders of over \$1 million on Ryan's books Sept. 1.

Company expects to begin production of 158 Army L-17B Navions late this month.

Spark Plugs Ordered

Spark plugs—235,850 of them—to cover plug requirements for all Air Force C-74s and B-36s during the next year have been ordered from AC Spark Plug Division of General Motors by Air Materiel Command headquarters at Wright Patterson Air Force Base.

Amounting to nearly \$1 million, the order was described by AC as the largest ever issued for aircraft spark plugs in peacetime. The type AC-181 plugs will provide six spares for each plug in the planes' R-4360 Pratt & Whitney engines.

** Saves the pump...
* Stores fluid under pressure for instant use*

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The Proven

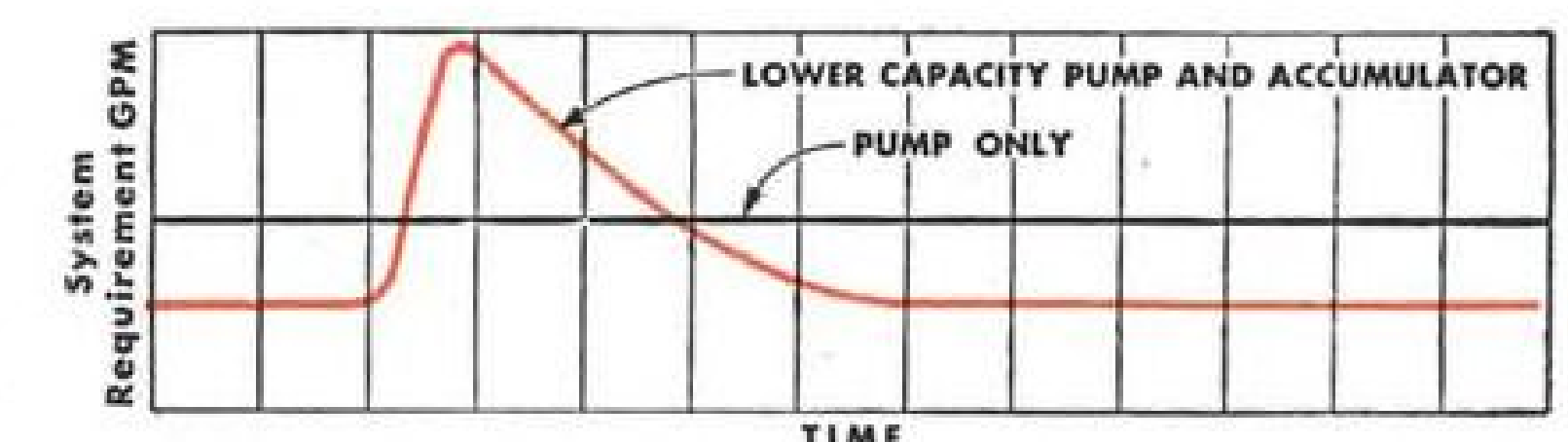
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This dependable combination is the proven answer for pressure control of 3000 P S I systems. Lighter in weight and serviceable for longer periods, the Bendix-Pacific Regulator and Accumulator assure simplified system design. They provide means of supplying fluid flow and pressure when desired, yet relieve the pump of continuous operation. Lighter pumps of lower capacity which consume less power can often be used, since the Accumulator will supply the additional power requirements of peak system demand, as is graphically illustrated below.

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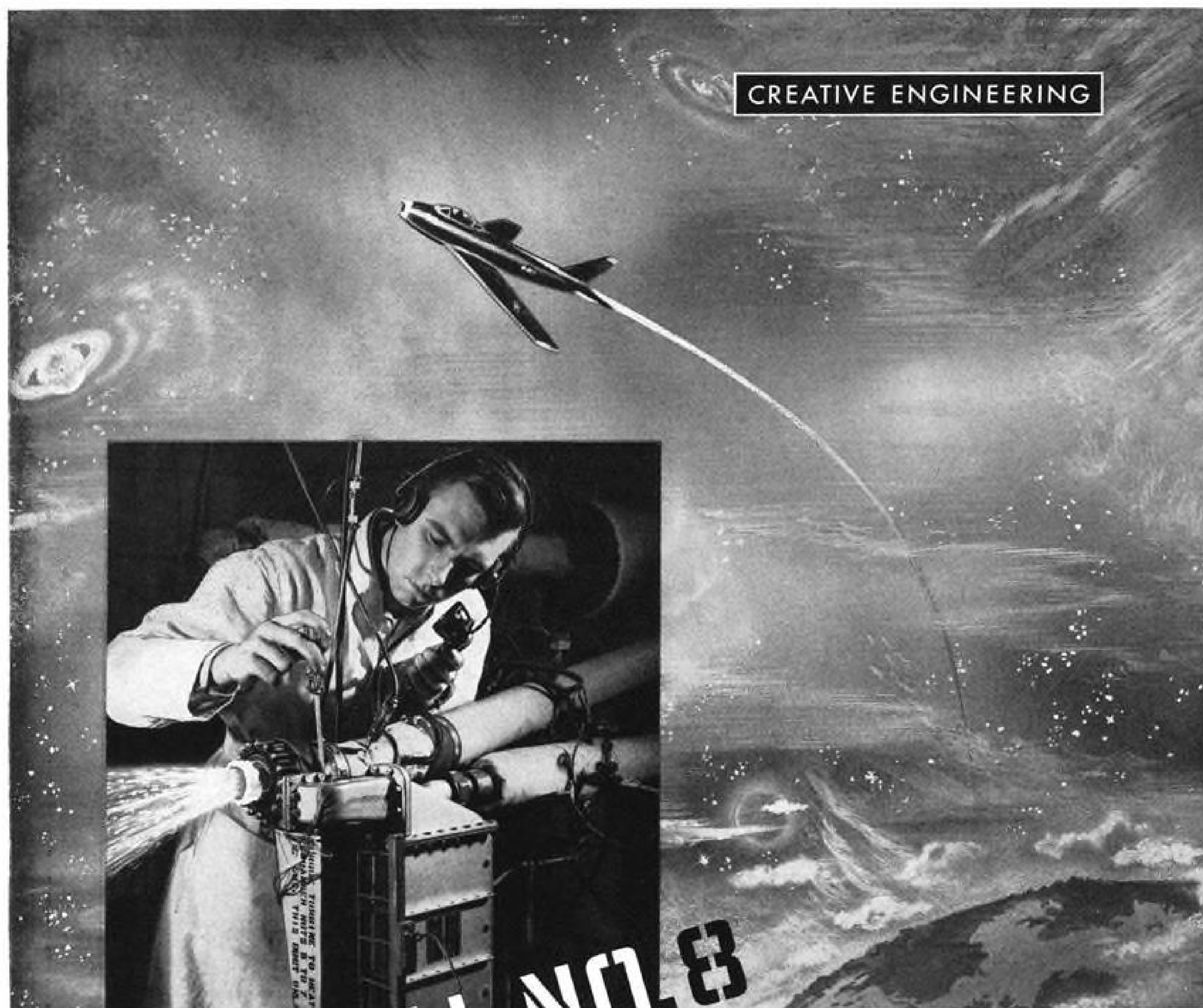
The exclusive Bendix-Pacific Accumulator shell design is

continuous past the equator. There are no flanges and bending moments are minimized. In addition, construction of the bladder provides for flexing over an extended area, prolonging service life. Long extended use of both the Accumulator and Regulator on thousands of military and commercial aircraft has demonstrated the outstanding advantages of this dependable combination. Detailed specifications of these and all other Bendix-Pacific hydraulic products are available on request.



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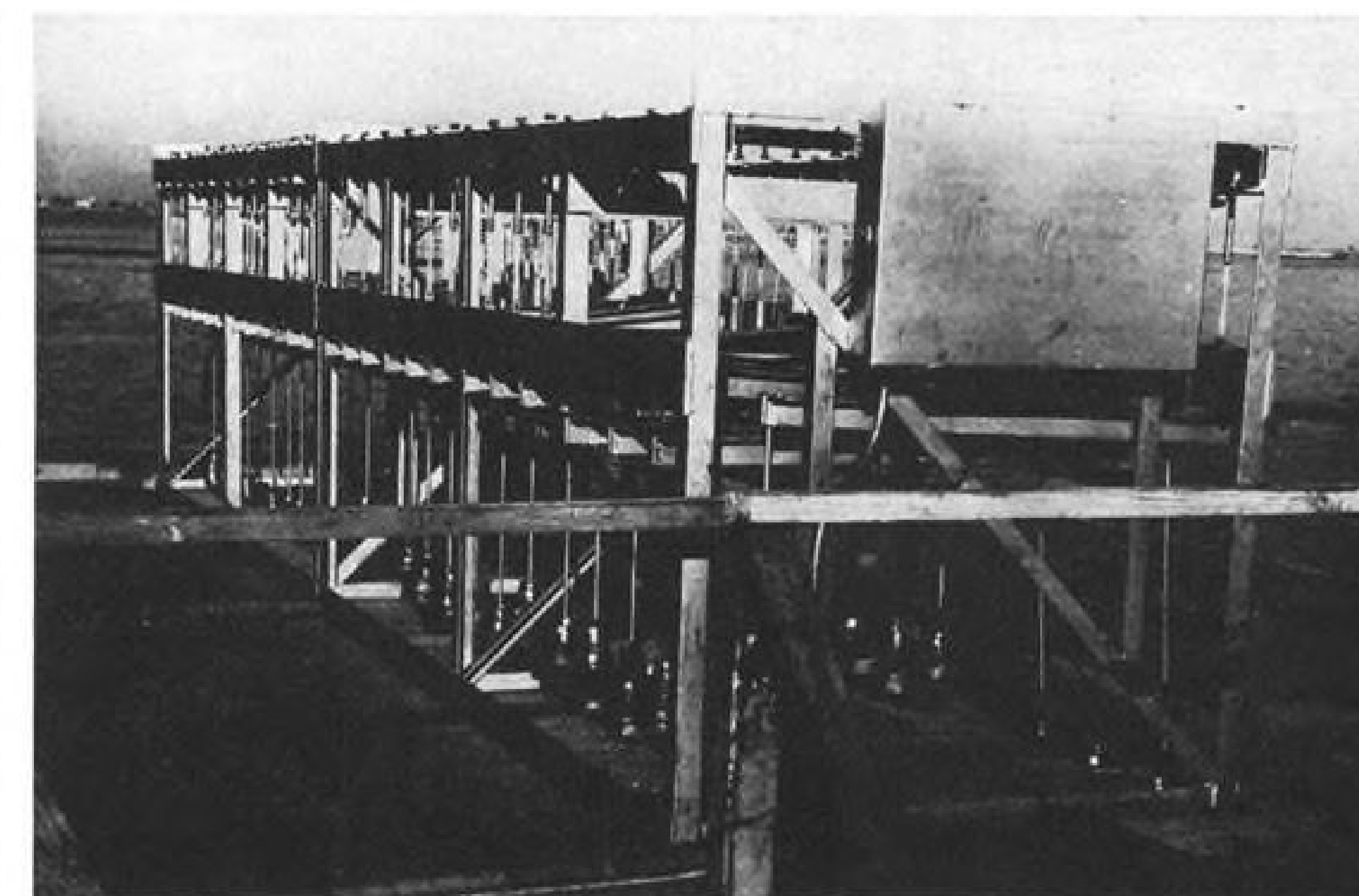
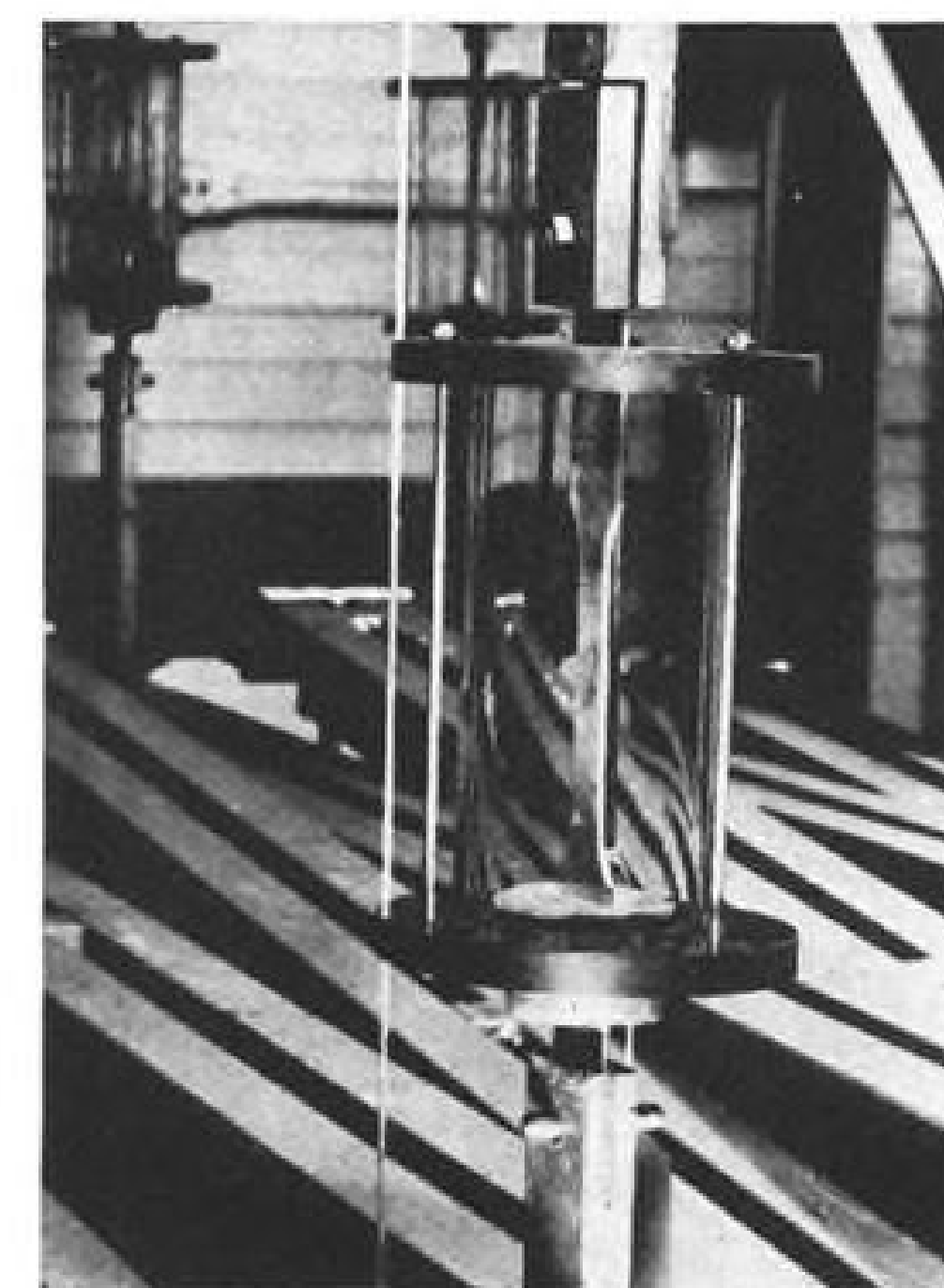
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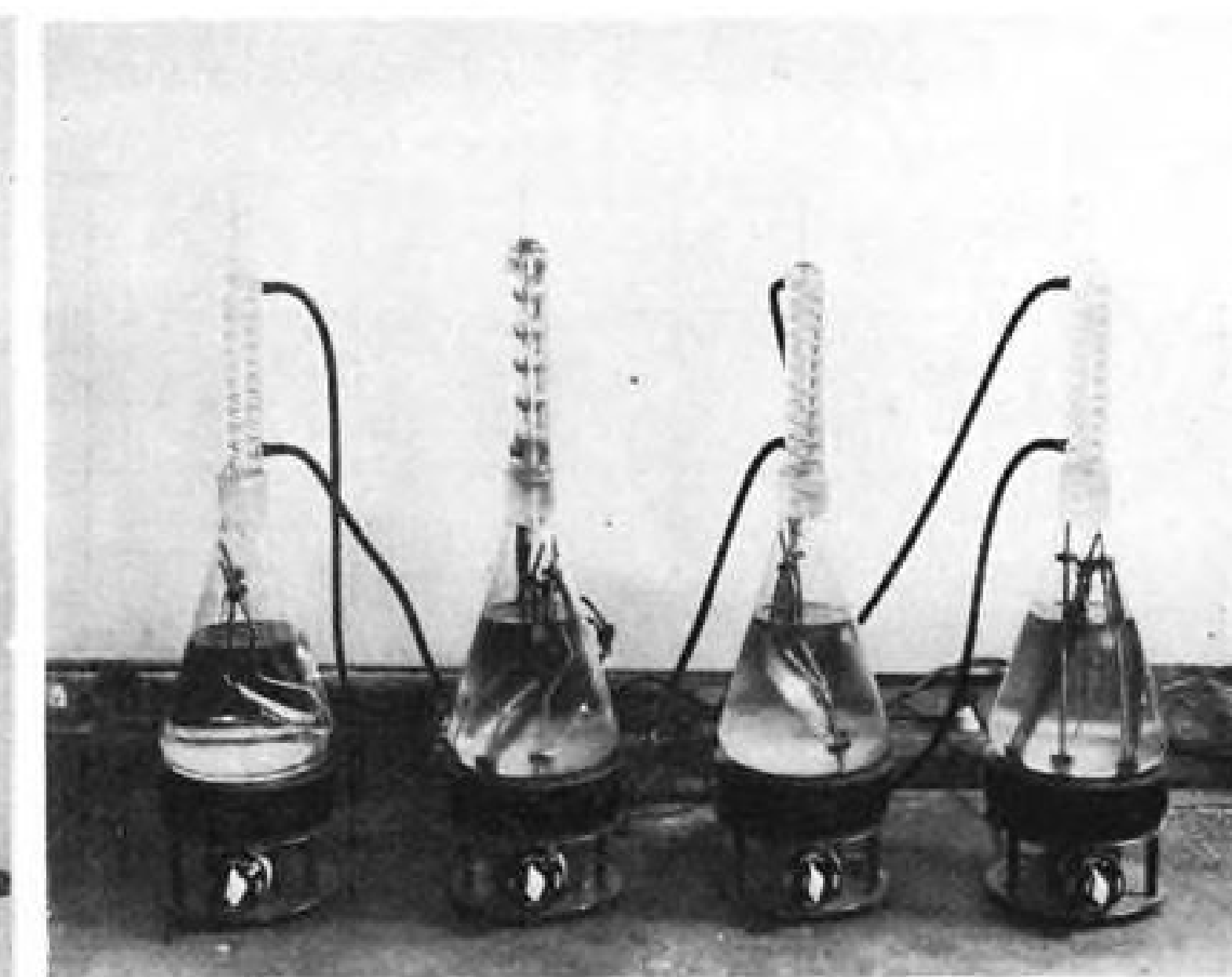
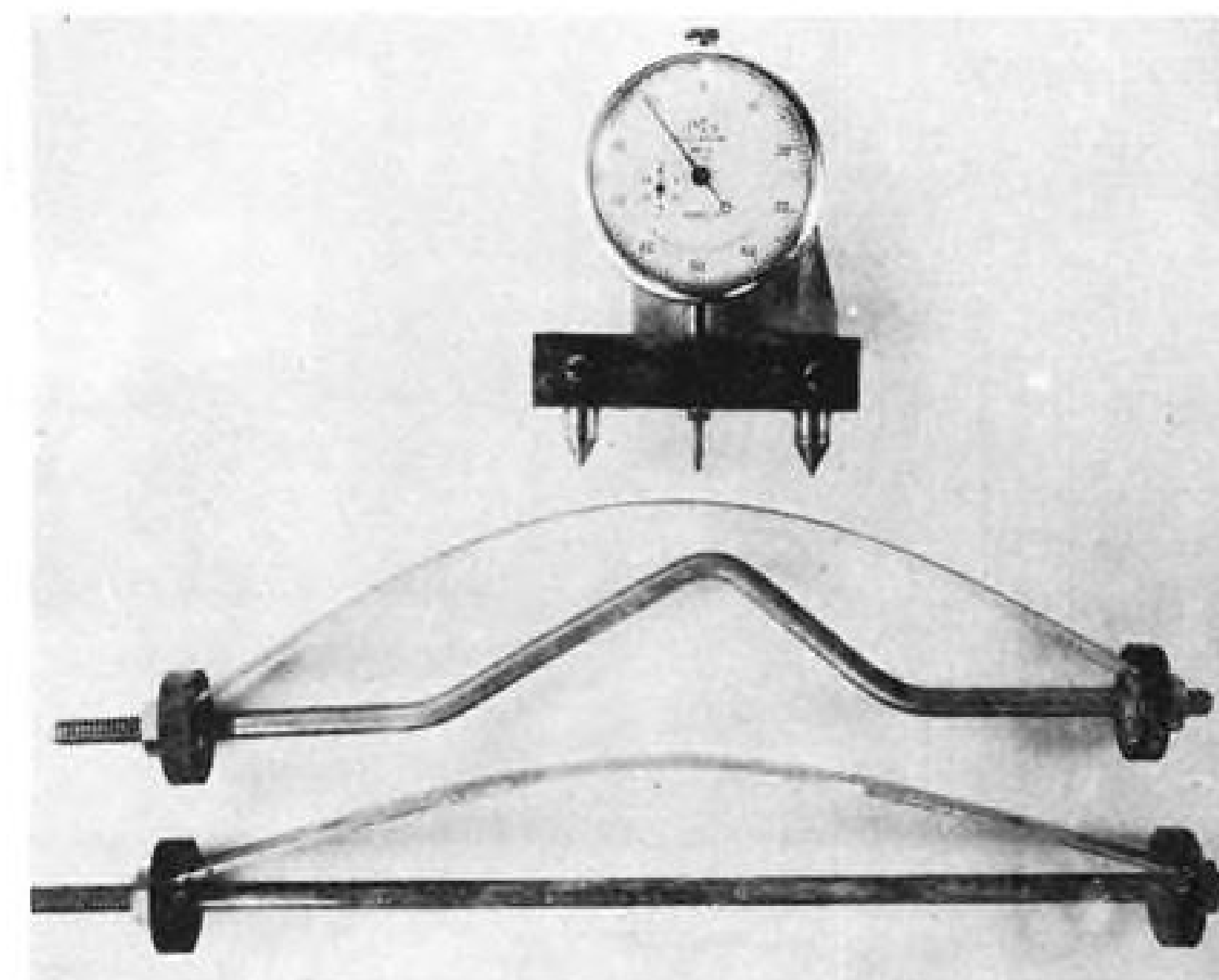
Write: AiResearch Manufacturing Company
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ENGINEERING



In accelerated corrosion-resistance tests of aluminum alloy sheet at National Bureau of Standards, specimen (left) is supported in glass cell containing $\text{NaCl-H}_2\text{O}_2$ solution. At right is the test rack for holding stressed alloy specimens in marine atmosphere.



In accelerated corrosion-resistance tests of aluminum alloy sheet at National Bureau of Standards, specimen (left) is supported in glass cell containing $\text{NaCl-H}_2\text{O}_2$ solution. At right is the test rack for holding stressed alloy specimens in marine atmosphere.

Stress-Corrosion Tests Evaluate Alloys

Resistance of aluminum structural materials studied
in accelerated checks and marine-atmosphere exposure.

Corrosion-resistance of the newer, high strength aluminum alloys have been studied by the National Bureau of Standards to determine their ability to withstand conditions encountered by military planes in tropical areas.

Alloys investigated included 75S-T, R301-T, R303-T, and the artificially aged 24S-T.

Methods and apparatus for accelerated laboratory tests of stressed samples in corrosive solutions were developed and applied by Hugh L. Logan and Harold Hensing of the Bureau staff.

According to the Bureau's report, marine-atmosphere exposure tests of the same materials under similar experimental conditions indicate a high

degree of correlation between results of the laboratory tests and what may be expected in actual service.

► **Basis of Comparison**—Introduced in 1932, the duralumin type of aluminum-copper-magnesium alloy known as 24S-T had largely replaced, within a decade, other aluminum alloys as sheet material for aircraft construction.

Although its resistance to corrosion was generally satisfactory, under some conditions it was appreciably attacked upon exposure to a marine atmosphere

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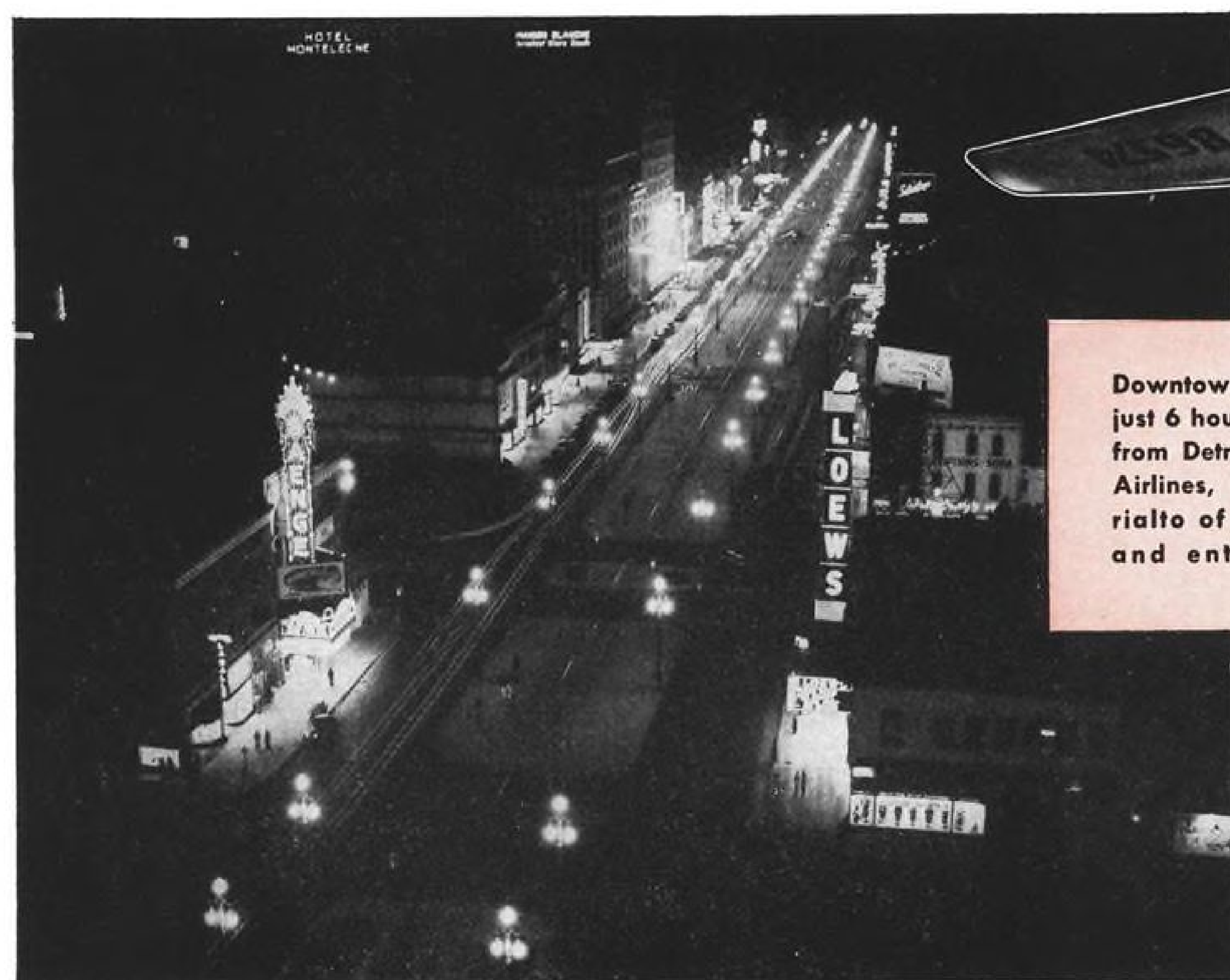
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or when subjected to sea water.

To increase corrosion resistance, it has been used in the form of a clad alloy, in which a duralumin sheet is sandwiched between, and integrally bonded to, two thin protective layers of commercially pure aluminum. This, however, results in some sacrifice of tensile strength.

As this material has been found to have adequate corrosion-resistance in service, it was used as a standard of comparison in the marine-atmosphere tests.

► **Alloy Properties**—With the advent of the war in 1939, stronger aluminum al-

loys became desirable for aircraft use. Efforts were made to develop alloys of greater tensile strength with adequate corrosion-resistance.

In the R301-T alloy, this result was sought by covering a duralumin-type alloy with an alloy-cladding layer of higher strength than commercially pure aluminum.

In the 75S-T and R303-T alloys, tensile properties were improved by the addition of appreciable amounts of zinc.

Use was also made of the discovery that elevated-temperature aging of the commercial flat 24S-T alloy results in a marked increase in yield strength.

► **Tests Made**—In the Bureau's investigation of the stress-corrosion resistance of these new materials, standard American Society for Testing Materials flat tensile specimens with $\frac{1}{2}$ -in. reduced sections were tested both in the laboratory and in a marine atmosphere under a stress equal to three-fourths of the yield strength.

In the laboratory, stressed samples of all alloys were continuously immersed in a sodium chloride-hydrogen peroxide solution (NaCl, 57g; 30-percent H_2O_2 , 10 ml; H_2O , 990 ml.). Those containing zinc as an alloying element (R303-T and 75S-T) were also exposed in a boiling 6-percent solution of sodium chloride.

Unstressed specimens were subjected to the same corrosive conditions so that the effect of stress in increasing corrosion damage could be evaluated.

All clad materials were tested with the cladding intact, since the purpose of the studies was to determine the resistance of the commercial alloy as actually used rather than that of the core material itself.

Losses in ultimate tensile strength and percent elongation were taken as criteria of corrosion damage.

► **Immersion, Outdoor Setups**—Specimens supported vertically and stressed via weighted levers were tested in the sodium chloride-hydrogen peroxide solution in cells made of 60-mm. cylindrical Pyrex tubes fitted at each end into slotted Bakelite disks. Rubber gaskets placed between the Bakelite and the glass, and rubber stoppers molded with rectangular slots slightly smaller than the grip ends of the specimens, completed the cell assemblies.

Samples up to 0.064-in. thick were kept in the sodium chloride-hydrogen peroxide solution for 24 hr.

One-eighth inch specimens were immersed for 72 hr., the solution being renewed at the end of each 24-hr. period.

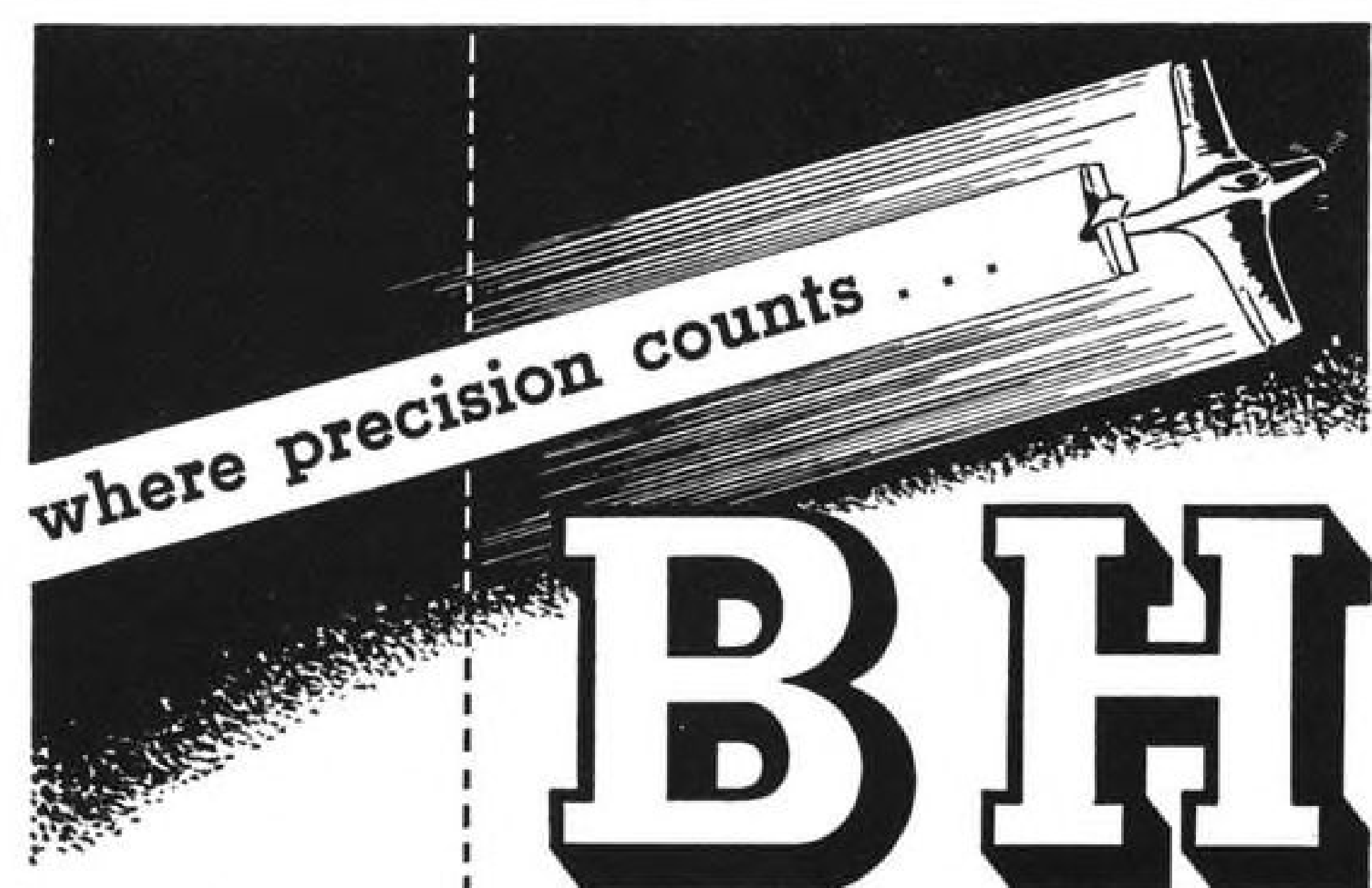
Breaking of a specimen under stress automatically opened a knife switch in the circuit of a solenoid counter actuated once every six minutes by a clock. Time required for failure of the specimen was thus recorded in units of $1/10$ hr.

After removal from the solution and cleaning, the specimens were broken in a hydraulic-type tensile testing machine to determine the tensile properties of the corroded material.

Metallographic examinations were also made to determine the types of corrosion that had developed.

For marine-atmosphere exposure tests, the specimens were supported and stressed in a similar fashion but were left exposed to the atmosphere.

Specimens immersed in boiling sodium chloride solution were stressed by bowing, utilizing a threaded Monel



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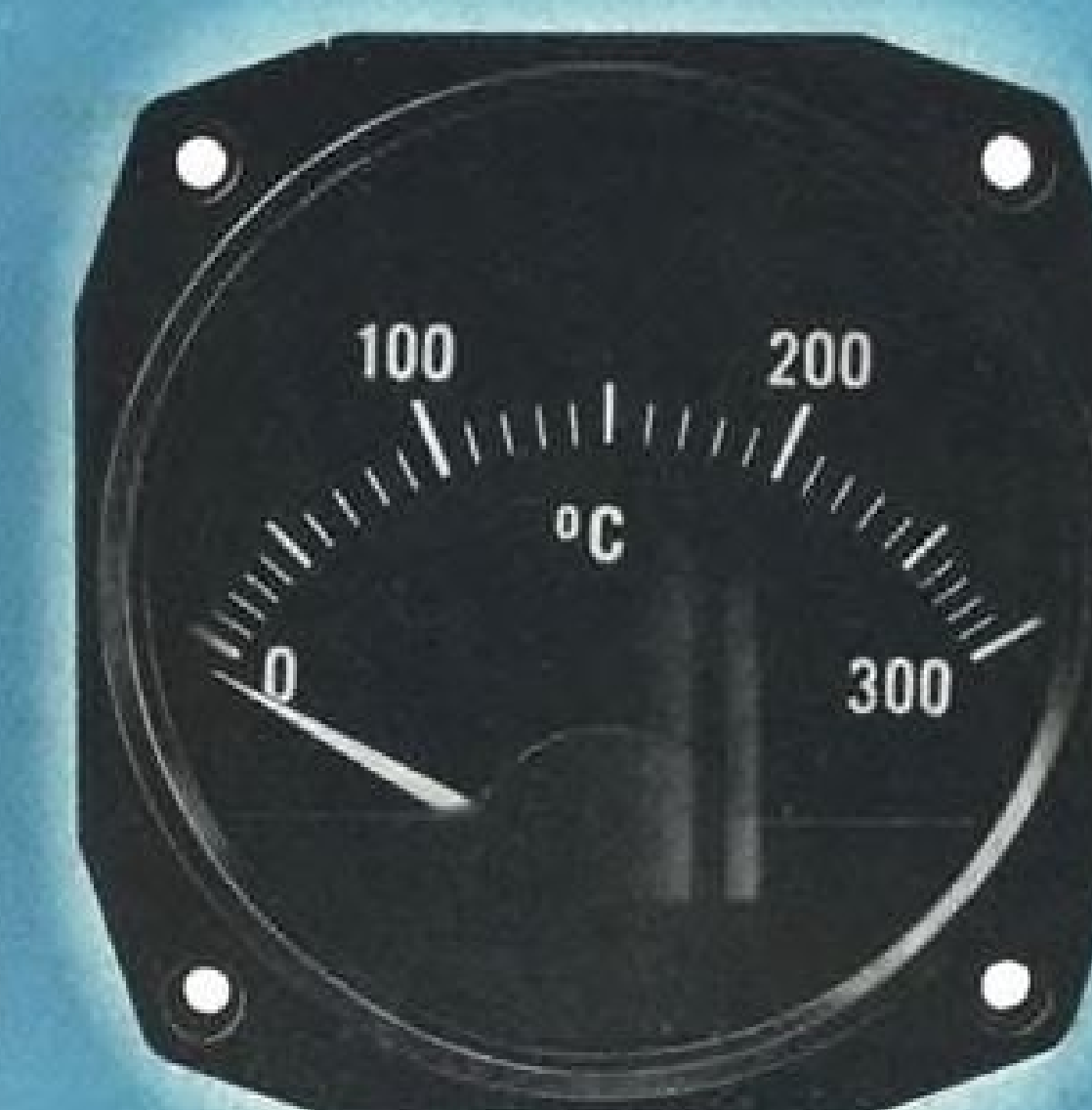
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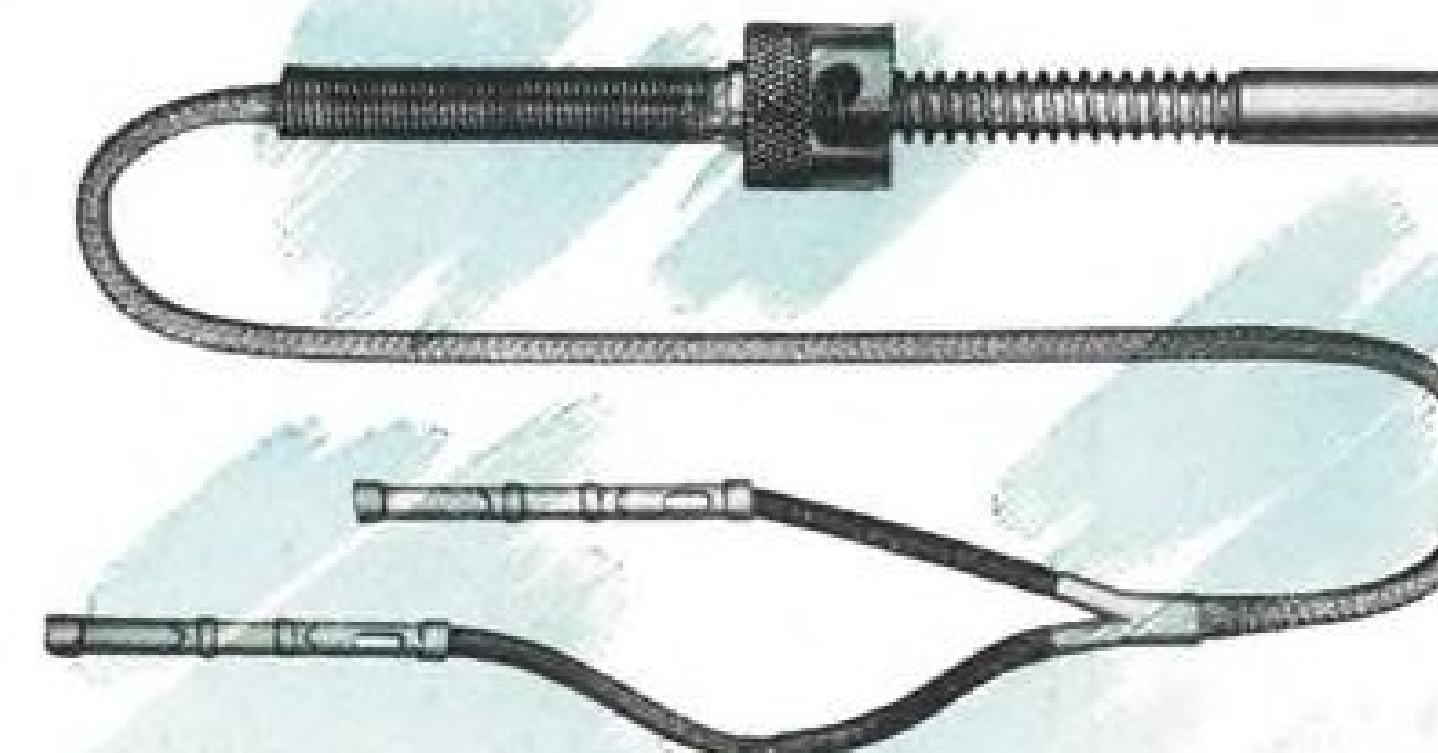


Single Electrical Indicator



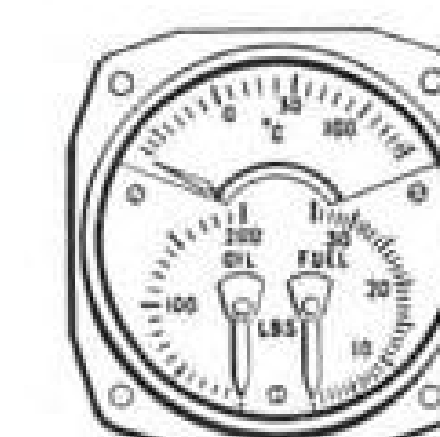
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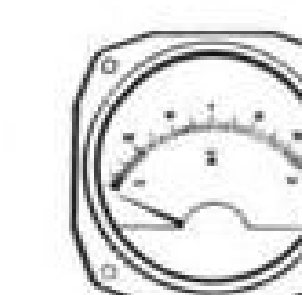


Tip-Sensitive Resistance Bulb

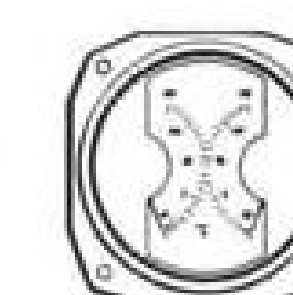
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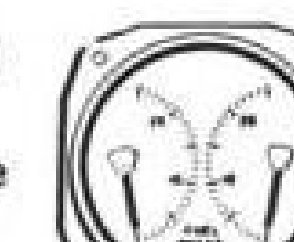
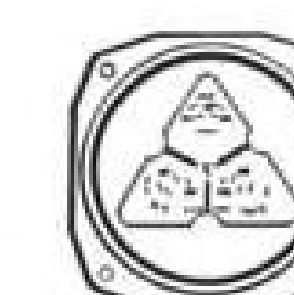
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EDISON AIRCRAFT SYSTEMS AND INSTRUMENTATION

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rod, insulating washers slotted to hold the ends of the specimen, and two nuts adjacent to the washers for tension adjustment.

The specimens were then placed in wide-mouthed flasks connected to reflux condensers and containing the sodium chloride solution. They remained in the boiling solution for 14 days unless earlier failures occurred. At the end of this time they were removed, cleaned, and broken in tensile tests.

One of the difficulties in stressing specimens by bowing has been because extremely small changes in the length

of the chord connecting the ends of the specimen will make appreciable changes in the stress in the outer fiber.

Hence, an instrument was constructed by means of which the distance from the chord to the outer fiber could be measured to 0.0001 in. and the stress computed much more precisely than by earlier methods.

Essentially, this device consists of two fixed pins and, between them, a third removable pin, which is attached to the plunger of a dial gage. Stresses computed from dial-gage readings differed from stresses obtained from wire strain gages (attached to the concave and con-

vex surfaces of the specimen) by less than 2 percent at $\frac{3}{4}$ of the yield strength. **► Test Data**—Results of the investigation indicate that flat, bare 24S-T aluminum alloy sheet aged 4 hr. or longer at 375 F. is not susceptible to stress-corrosion cracking in either the laboratory or marine atmosphere tests, and is at least as resistant to the combined action of stress and corrosion as the commercially heat-treated but unaged material.

It was found that aging of a sample of this alloy for 3 hr. at 385 F. produced an increase in yield strength of about 25 percent above an initial value of approximately 50,000 psi., an increase in tensile strength of about 3 percent above an initial value of approximately 70,000 psi., and a decrease of about $\frac{2}{3}$ in the initial elongation of 17 to 18 percent.

Similar results were obtained when the material was aged for 20 hr. at 350 F., 5 hr. at 375 F., or $1\frac{1}{2}$ hr. at 400 F.

Samples of other alloys that were tested, with the exception of R301-T, were found by the Bureau to be adequately resistant to stress-corrosion cracking. Failure of the R301-T samples was attributed by the researchers to the result of the penetration of stress-corrosion into the core material at the machined edges of the relatively narrow ($\frac{1}{8}$ -in. wide) specimens that were tested. But such damage, the Bureau reports, would probably not be significant in wide sheets, particularly those cut by shearing.

In general, it is claimed, it was apparent that the short-time laboratory tests give a good indication of the corrosion resistance to be expected of the unclad alloys in a marine atmosphere. However, results of continuous immersion tests on clad material in the laboratory do not necessarily agree with those obtained by exposure in a marine atmosphere.

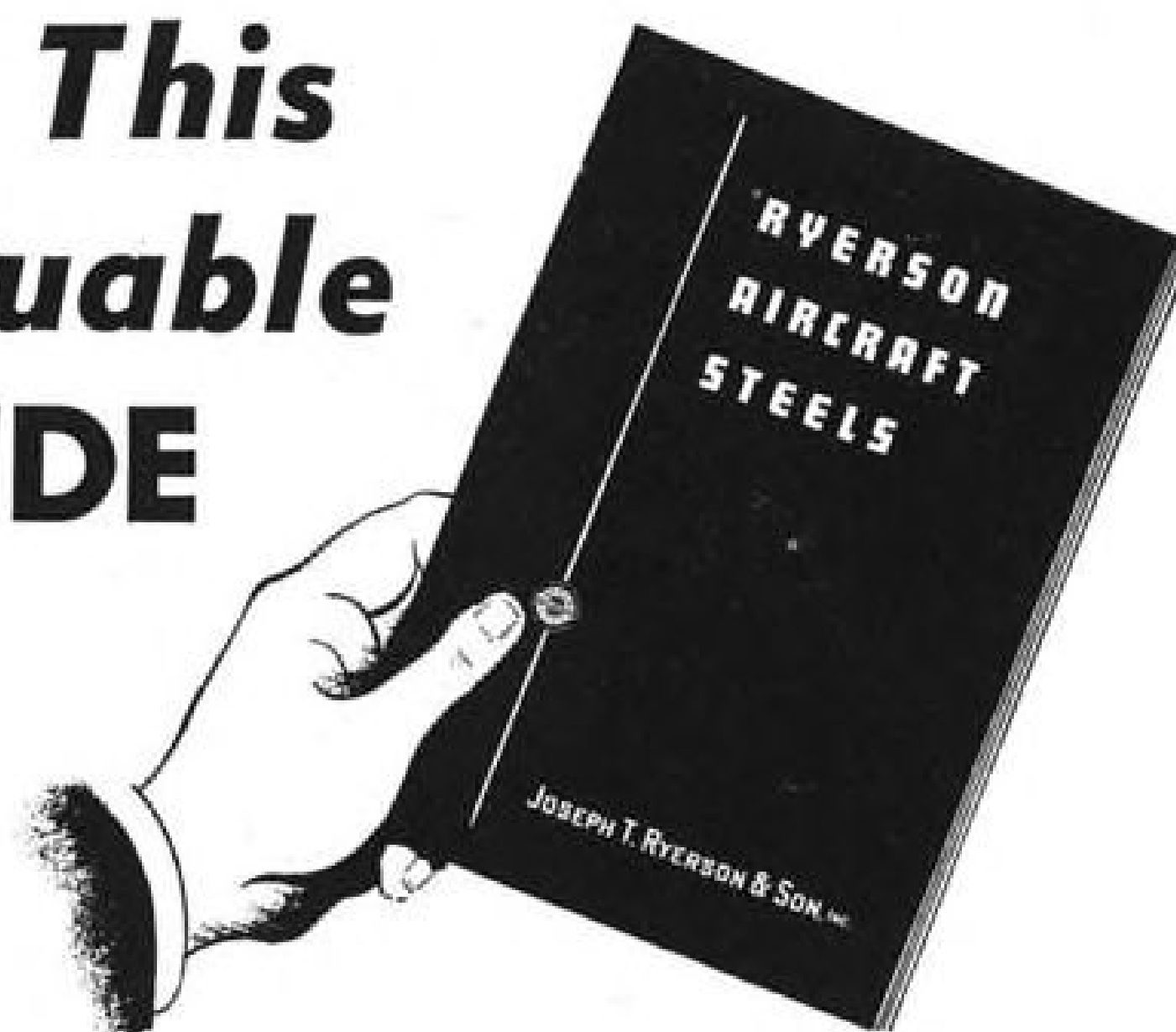
Reference

Logan, H. L., and Hessing, H., "Stress-Corrosion Tests on High-Strength Aluminum Alloy Sheet", J. Research NBS 41, 69 (1948) RP1905.

Propeller Improved

New construction is featured in fixed-pitch wooden props made by Propeller Div., G. B. Lewis Co., Watertown, Wis. Resorcinol resins bond the larger number of laminations to provide increased strength and longer life. Dull black thrust faces eliminate glare and new impregnating varnish is intended to give greater durability and better performance. Stainless steel tipping extends close to hub and is ground down to extremely smooth surface.

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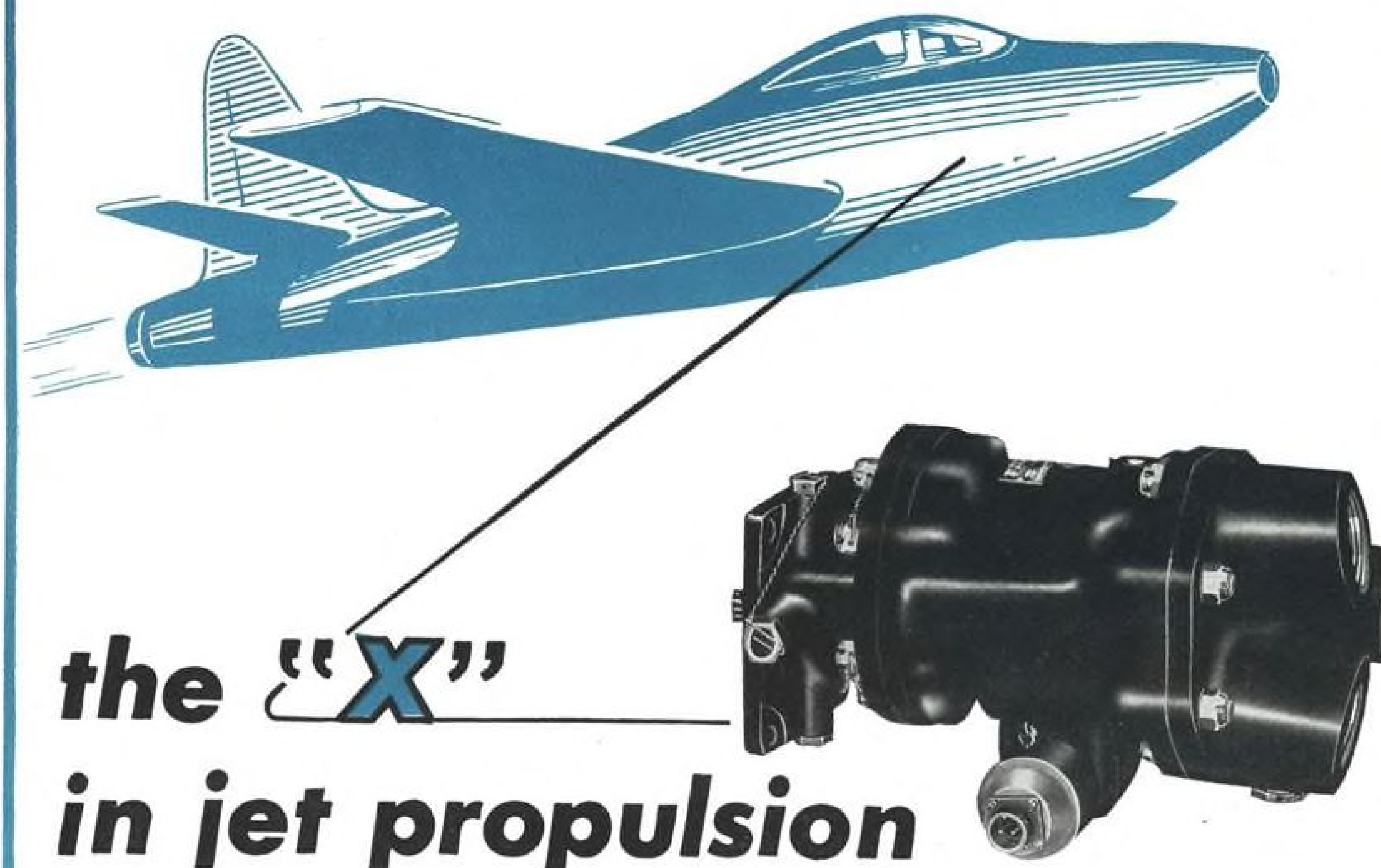
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1. The pump must deliver a barrel of gasoline in $1\frac{1}{4}$ minutes . . . three times the amount previously required.
2. It must pump that amount at as much as 750 lbs. per square inch pressure . . . 15 times the pressure used by American airplane engines during World War II.
3. It must have nearly the same service life as low pressure pumps. This was

the real sticker . . . since gasoline has no lubricating qualities, the wear of internal parts increased much more rapidly with higher pressures.

Pesco not only developed a high pressure fuel pump that met all requirements but went a step further in producing a pump with two pumping sections . . . one for the main fuel system and the other for the secondary system which goes into operation automatically . . . just in case.

The success of Pesco's solution to the "X" in jet propulsion is attested by the fact that today every American production jet engine uses a Pesco high pressure fuel pump.



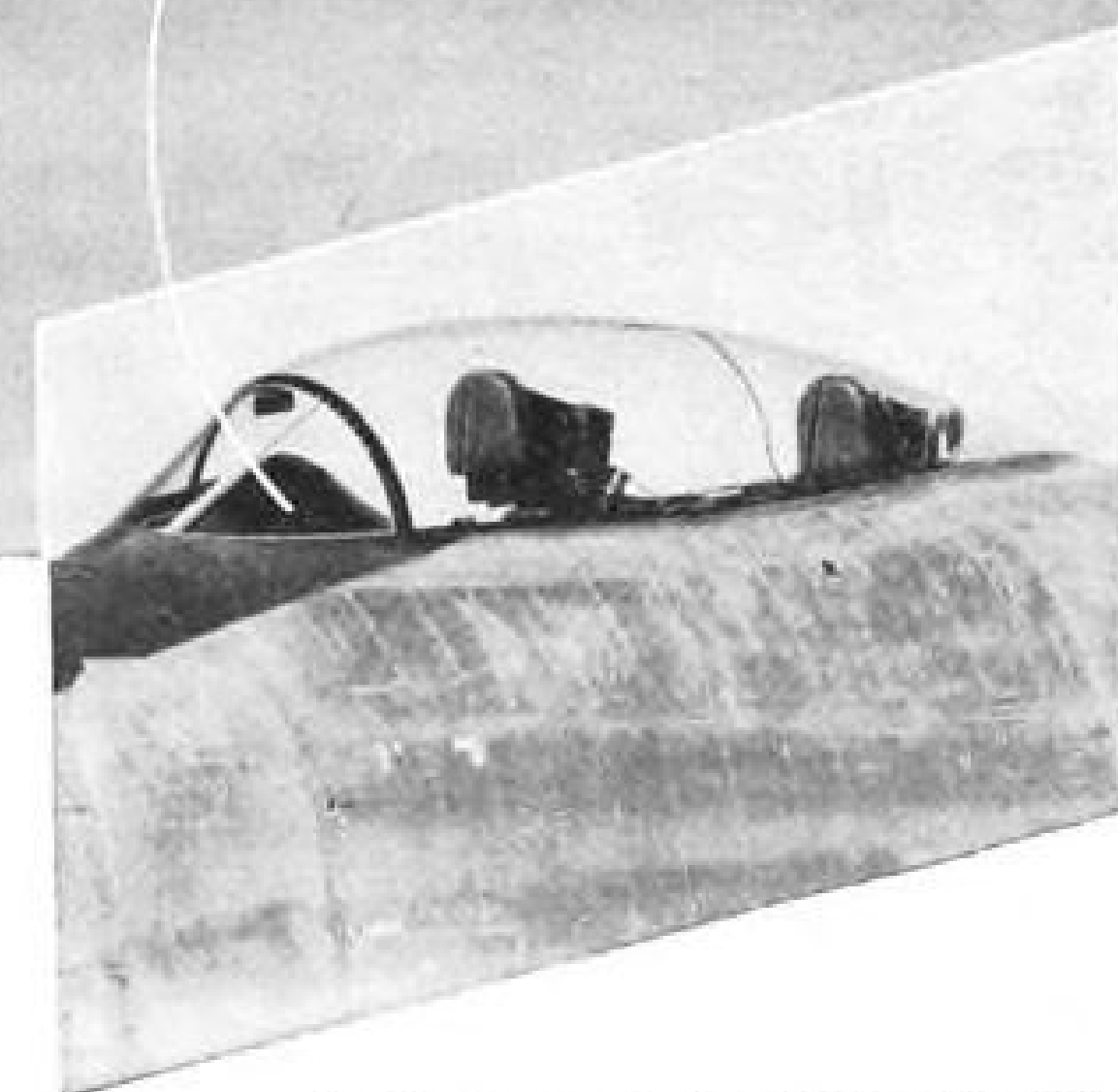
On the North American Four Jet Bomber



GLAZING the pilot's cockpit of the X B 45 involved many new, major problems in optics and in construction. They were solved successfully when "Pittsburgh", by applying proved principles, developed a special glass and plastic combination and a unique method of joining and mounting the panels.

Most of the best known modern planes are now equipped with special glasses and glass and plastic combinations originated by "Pittsburgh." For this company is continuing its aggressive development policy which, over the years, has met the increasing demands of your industry successfully with practical new glazing materials and methods.

Many important improvements and innovations in airplane design, construction and operation have been made possible by "Pittsburgh" research, manufacturing resources, and glass-making experience. So, when you are facing new problems that concern airplane glasses and glazing techniques, we invite you to bring them to "Pittsburgh" for successful solution, Pittsburgh Plate Glass Company, 2357-8 Grant Building, Pittsburgh 19, Pennsylvania.



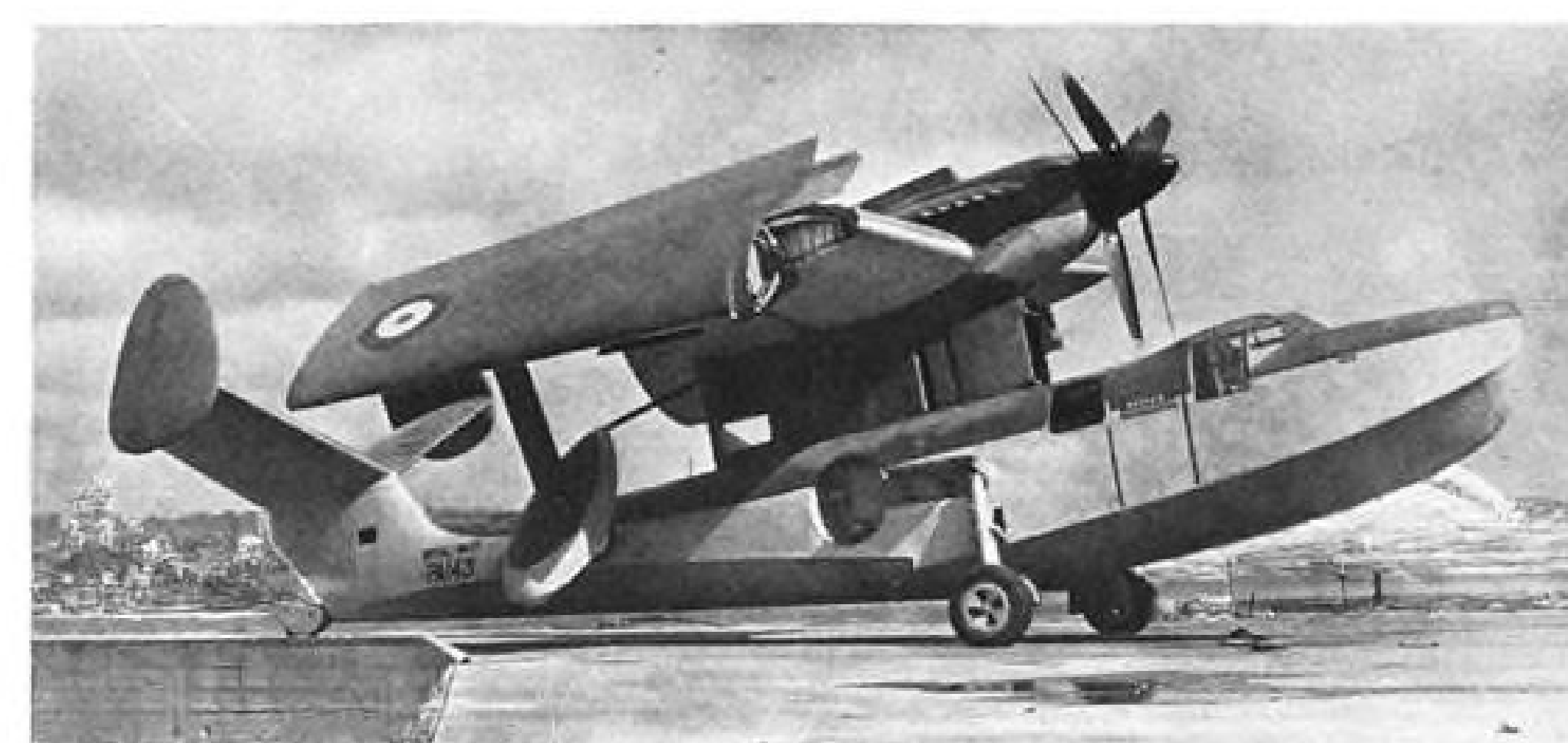
In the pressurized cockpit of the X B 45, the flat and curved panels of the windshield embody an entirely new development in airplane glazing. Made of a special type of Flexseal (laminated safety glass and plastic) originated by "Pittsburgh," they are free from optical distortion, comparatively light in weight, yet flak-resistant. A new and different method of joining the multiple curvatures of the panels to each other and to the fuselage in a flush mounting, imparts to the entire assembly rigidity and strength that more than meet the structural requirements.



PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

NEW AIRCRAFT



Seagull Features Pivoted Wing

British amphibian, now undergoing its taxi tests, uses variable-incidence wing for shorter takeoff runs.

Taxiing trials are now taking place in Southampton Water of Vickers-Armstrongs' new amphibian, the Seagull.

Conceived in 1944 as potentially useful in the event of a drawn-out war in the Pacific, the craft will probably not now be ordered in quantity for British naval aviation.

Developed by Vickers-Armstrongs' Supermarine Division to succeed the well-known Walrus and Sea Otter amphibian utility planes, and like them, intended for air-sea rescue, reconnaissance, and fleet spotting, it has longer range, more space, and better performance.

► **Novel Wing**—Chief interest is the variable-incidence wing, which pivots at the roots and can be inclined at a higher attack angle for faster takeoffs with shorter runs, and to develop a very high lift coefficient which should make possible safe landings at much lower speeds.

Lift is also improved via interconnected full-span, leading-edge slots and slotted flaps.

Power-operated wing-folding permits stowage aboard ships in minimum space.

Main gear and tail wheel retract hydraulically. For water-operation solely, the landing wheels can be quickly de-

tached. An arrester-hook can be fitted for operation from carrier deck.

The Seagull is powered by a single Rolls-Royce Griffon liquid-cooled, 12-cyl., in-line engine, driving Rotol contra-rotating propellers.

This power plant develops 2500 hp. at takeoff, with water-methanol injection and 25 psi. boost, and gives maximum speed of 260 mph. at 11,800 ft. when fully supercharged.

► **Performance**—Range at average cruising speed of 131 mph. is 875 mi. with normal gross weight of 14,500 lb. With two extra 60-gal. wing tanks, range is increased to 1230 mi.

Empty weight (as amphibian) is 10,510 lb.; weight of fuel (285 gal. in internal tanks), 2052 lb.; oil (8 gal.), 72 lb.; and service load is 1866 lb.

Span is 50½ ft., and maximum width with wings folded is 23½ ft. Wing area is 432 sq. ft., length is 44 ft., 1½ in.

At normal gross weight, takeoff time on water in still air is 16 sec.; distance on land in still air is 765 ft.; and distance on carrier deck in 31-mph.-wind is 317 ft.

Stalling speed at landing weight of 12,720 lb. (1 hr. cruising fuel remaining) is 59 mph. with engine off, 54 mph. engine on.

The Seagull's normal wing loading is 33.60 lb. per sq. ft. Normal power loading at takeoff is 5.80 lb. per bhp.

The craft's service ceiling is 23,700 ft.

If the required minimum test flights could be completed in time, the Seagull was to be shown at Society of British Aircraft Constructors' recent exhibit at Farnborough.

Beechcraft Bonanza...




...has a FEATHER-WEIGHT in its "Cool-Tank"

The Beechcraft Bonanza (Model 35) All-Metal Four-Place Monoplane, a recent creation of Beech Aircraft Corporation, Wichita, Kansas, has a FEATHER-WEIGHT All-Aluminum Oil Cooler built into its Beech-designed "Cool-Tank".

The Beechcraft Bonanza is another of the growing numbers of modern aircraft that are taking advantage of the unique construction and accurate testing of FEATHER-WEIGHT oil coolers.

Light, strong and compact because their thin, all-aluminum sections are brazed with aluminum alloy, FEATHER-WEIGHT oil coolers offer maximum resistance to extremes of temperature, pressure, vibration and shear.

Testing in the largest, most modern wind tunnel laboratory in the aeronautical heat exchanger industry accurately predicts FEATHER-WEIGHT performance under actual flying conditions.

Inquiries concerning FEATHER-WEIGHT all-aluminum oil coolers are invited. CLIFFORD MANUFACTURING COMPANY, 561 E. First Street, Boston 27, Massachusetts. Offices in New York, Chicago, Detroit, Los Angeles.

CLIFFORD

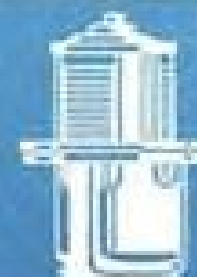
Feather Weight

ALL-ALUMINUM OIL COOLERS

HYDRAULICALLY-FORMED BELLOWS



Instrument Bellows



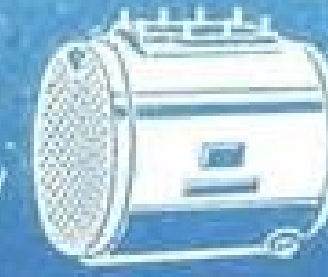
Aircraft Bellows Assembly



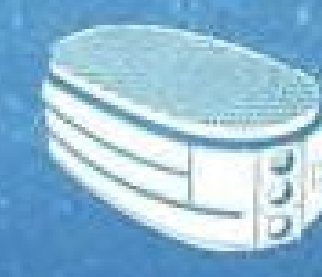
Steam Trap Bellows Assembly



Bellows Seal Assembly



All-Aluminum Cylindrical Oil Cooler



All-Aluminum Oval Oil Cooler



Author Fedan stands beside Danish four-place "Lark," built by Skandinavisk Aero Industri.

Europe's Progress In Lightplanes

Design details of postwar personal aircraft abroad offer noteworthy features meriting study by our own industry.

Editor's Note

AVIATION WEEK presents here the first comprehensive article analyzing the principal lightplanes of Europe, written by a recognized American authority on the subject. Few American engineers are better qualified than Sid Fedan to pass judgment on the European counterparts of American postwar personal planes. As manager

of Aeromatic Propeller Department of Koppers Co., Inc., Baltimore, Md., Fedan has had opportunity to fly most American personal planes, prewar and postwar, in the same weight and power categories as those he describes. The benefit of this comparative experience is evident in the analysis which follows on the succeeding pages.



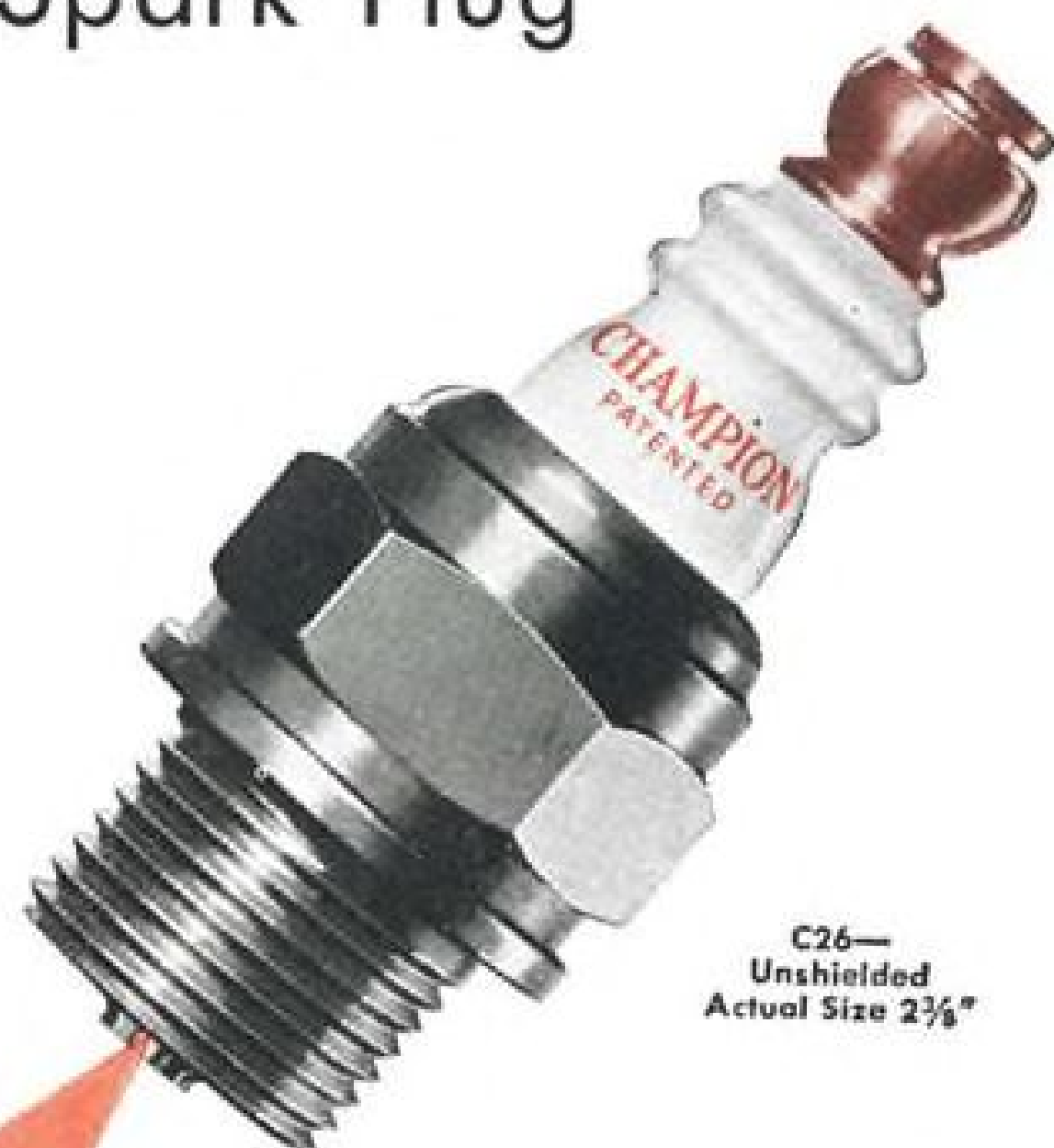
French S.I.P.A. sport plane is two-place, 85-hp., 125-mph. craft.

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ticular engine is only given after long, exhaustive and expensive tests.

We are proud of the fact that Champions are in daily use in practically every type of aircraft engine now in service. Champion Spark Plug Company, Toledo 1, Ohio.

FOLLOW THE EXPERTS
USE CHAMPIONS AND FLY WITH CONFIDENCE

Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network

Europe's Lightplanes

By Sidney H. Fedan

A postwar aviation survey through England, Denmark, Sweden, France, The Netherlands and Switzerland, to determine existing potential for export business for Aeromatic propellers, and to lay the ground work for foreign licenses of the propeller, has produced a general impression that business recovery in Western Europe is on its way.

Many economic and political handicaps face most of the countries. But in spite of these, the people I saw were anxious to work, and the spirit they demonstrated could not help but inspire the belief that they will definitely recover.

I was encouraged regarding production of light aircraft and the degree of Government sponsorship of new designs. This was true in every country even under the strictest priority allocation of strategic materials. The apparent reasons for this backing are military security (development of pilots), export trade, and local national industry.

► **Competition for U. S.?**—I visited aircraft plants and flew airplanes in all these countries and was impressed with the advanced design and performance. Some of the sales departments even talked about competing on an export basis with the American market. Price-wise, I cannot see how this is possible as the limited production and higher cost of materials more than offset the direct labor wage scale advantage.

The general European market today is comparable to the American market in 1946 where the obsolete equipment of prewar use has not yet been supplemented by postwar aircraft production. Each country is competing for its neighbor's export market in the same sense as American manufacturers of light aircraft competed with each other for the American market.

In the Western Hemisphere the markets of Canada and South America were mentioned. The advantage of trading from a European nucleus may have several forms, like the establishment of money reserve, as in the case of South America where a sterling credit is periodically established and exchanged for British purchases of beef from Argentina. When this credit becomes substantial, the encouragement of trade in sterling goods is reflected in the reduced tariffs.

At that time the dollar credit may be low enough to encourage trade restrictive tariffs on dollar products. Regardless of political sympathies, the investment and development of trade channels by England, for example, still



Model of Heenan, Winn & Steel "Satellite," five-place, 250-hp. craft.



Dutch Fokker "Promoter" is four-place pusher.

puts them in a very advantageous position for doing business within the sterling block.

The following observations represent the result of contact with some of the manufacturers of light aircraft in the above-mentioned countries.

In England, Miles Aircraft, Ltd., Aerodrome, Reading, Berkshire, was producing the bimotor "Gemini." The export version of this aircraft is to have two 125-hp. Continental engines with Aeromatic propellers, if foreign exchange allows. Their current plan to encourage export sales is to conduct a world tour with this aircraft. Two of the principal sales targets are Canada and the United States. (Editor's Note: Production plans for this craft are now uncertain. Since the author's trip, the company has been reported bankrupt.)

This four passenger ship is reputed to have a maximum level flight speed of 156 mph. with the Continental engine installation. It is also expected to have a single engine ceiling. Several of these airplanes are flying in England, with de Havilland engines, and a rather ambitious production assembly line has been provided for.

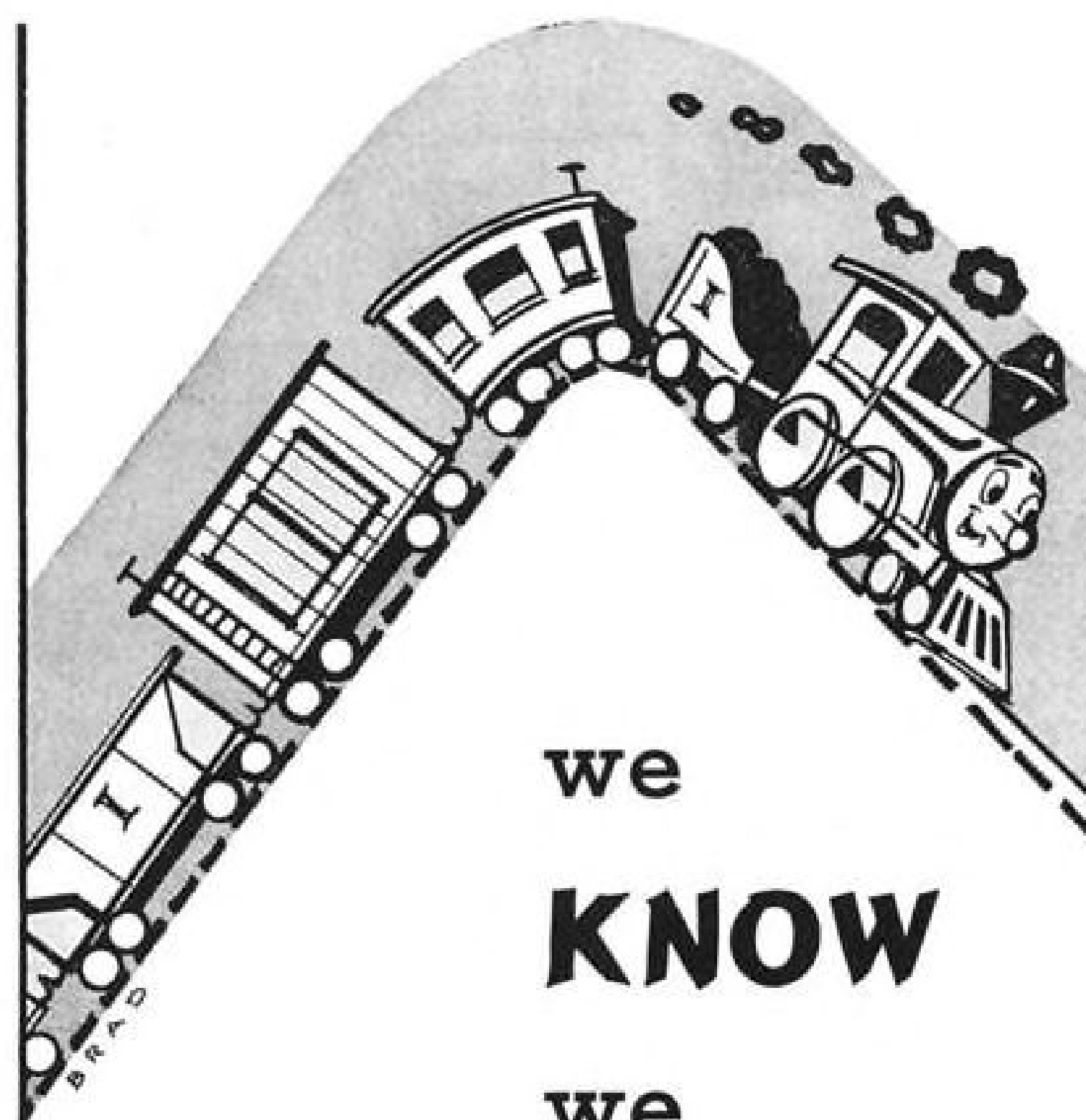
The design configuration is low wing, retractable landing gear with the two Gypsy engines mounted forward of the leading edge. This design is of

interest to private pilots, as it represents a bimotor landplane in the private flyer's class that, to date, has not been brought to a successful commercial offering in America, although the Langley molded plywood bimotor in the States made such an attempt.

► **Satellite** — Another interesting new British development is the "Satellite," which possesses many unique design features. This plane was designed by Heenan, Winn & Steel, 29 Clarges Street, Piccadilly, London. It is a five-place, all-metal monoplane, the first private aircraft to be constructed of welded magnesium sections which will reduce weight by 35 percent.

The fuselage is of streamline form, being constructed entirely of magnesium sheeting except the upper half of the front portion which consists of molded Plexiglas. The pilot's position is merged into the general form without the usual windshield projecting into the slipstream. The portion behind the occupants' cabin is in the form of a tapering tube of sufficient thickness to provide its own stiffening without ribs or stringers.

The de Havilland Gypsy Queen engine is situated behind the cabin in the center of the fuselage. Immediately behind the engine is a joint which unbolts for removal of the rear portion



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We've been getting hard-to-make gears
"over the hump" for 43 years.



The driven gear shown here is 5" in pitch diameter and 15" long overall. It is carburized and hardened with heat treating distortion held within .001".



of the fuselage, leaving the front portion supported by the tricycle undercarriage. This is for removal or inspection of the engine. An intake at the top of the fuselage draws air by a suction fan through the gills of the cylinder and passes out through a control vent.

A magnesium propeller shaft is connected to the engine by a flexible coupling and centering ball. The Aeromatic propeller is mounted aft of the tail surfaces. A butterfly tail unit is utilized, acting as both elevators and rudder. A third surface, vertically disposed, acts as a yawing stabilizer and propeller protector in event of a tail-down landing. The tricycle landing gear is retractable.

Two alternate power plants are offered—the Gypsy Queen with 250 hp. and the Gypsy Major with 142 hp. Estimated level flight speeds are 208 mph. for the Queen, 173 for the Major.

The prototype of this aircraft is now in the course of completion and flight tests will be conducted very shortly.

► **Danish Lark**—In Copenhagen, Denmark, I visited Skandinavisk Aero Industri, Slusholmen, Sydhavnen. This firm is in production of a four-place airplane equipped for export with a Continental 125-hp. engine and an Aeromatic propeller.

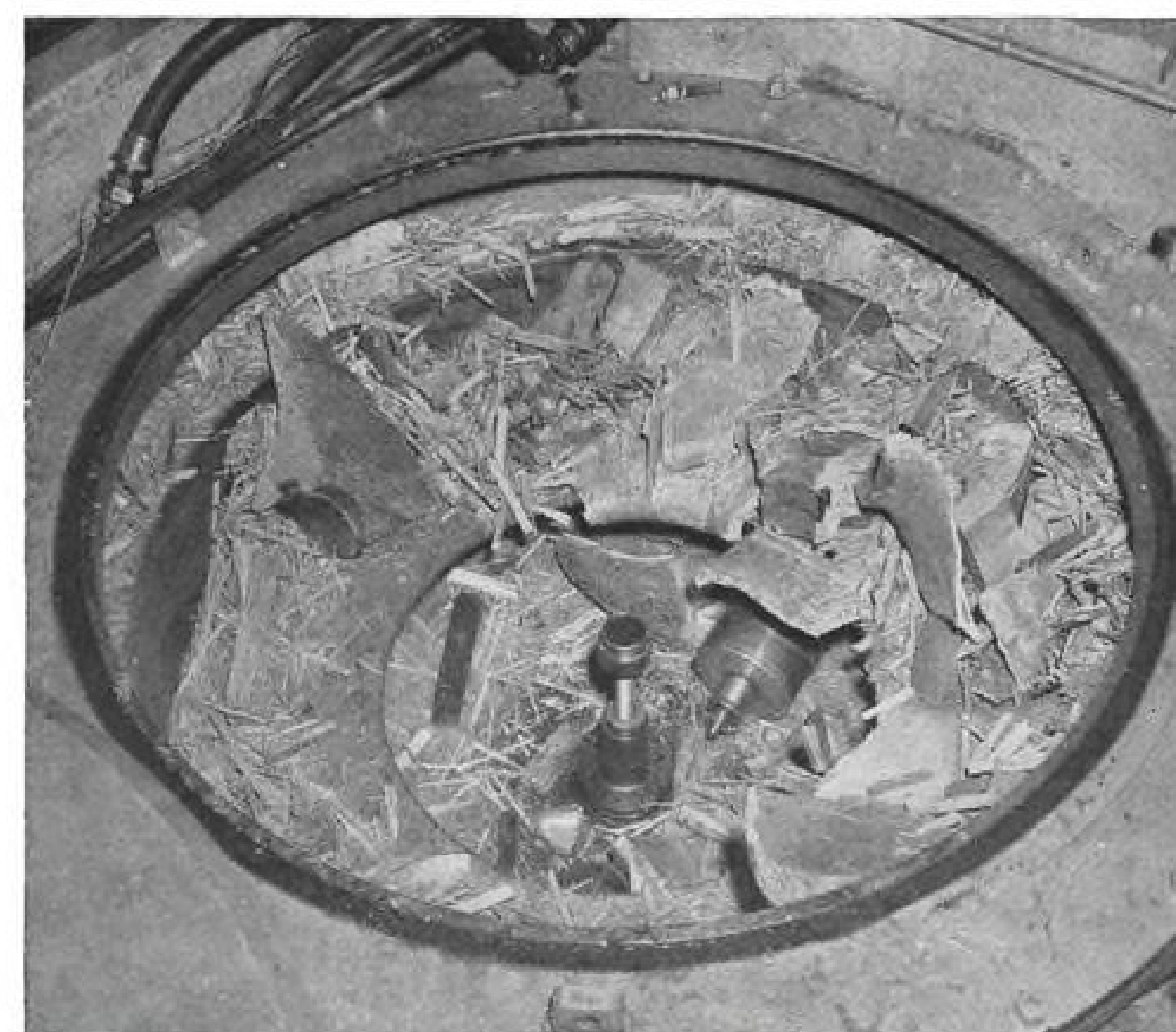
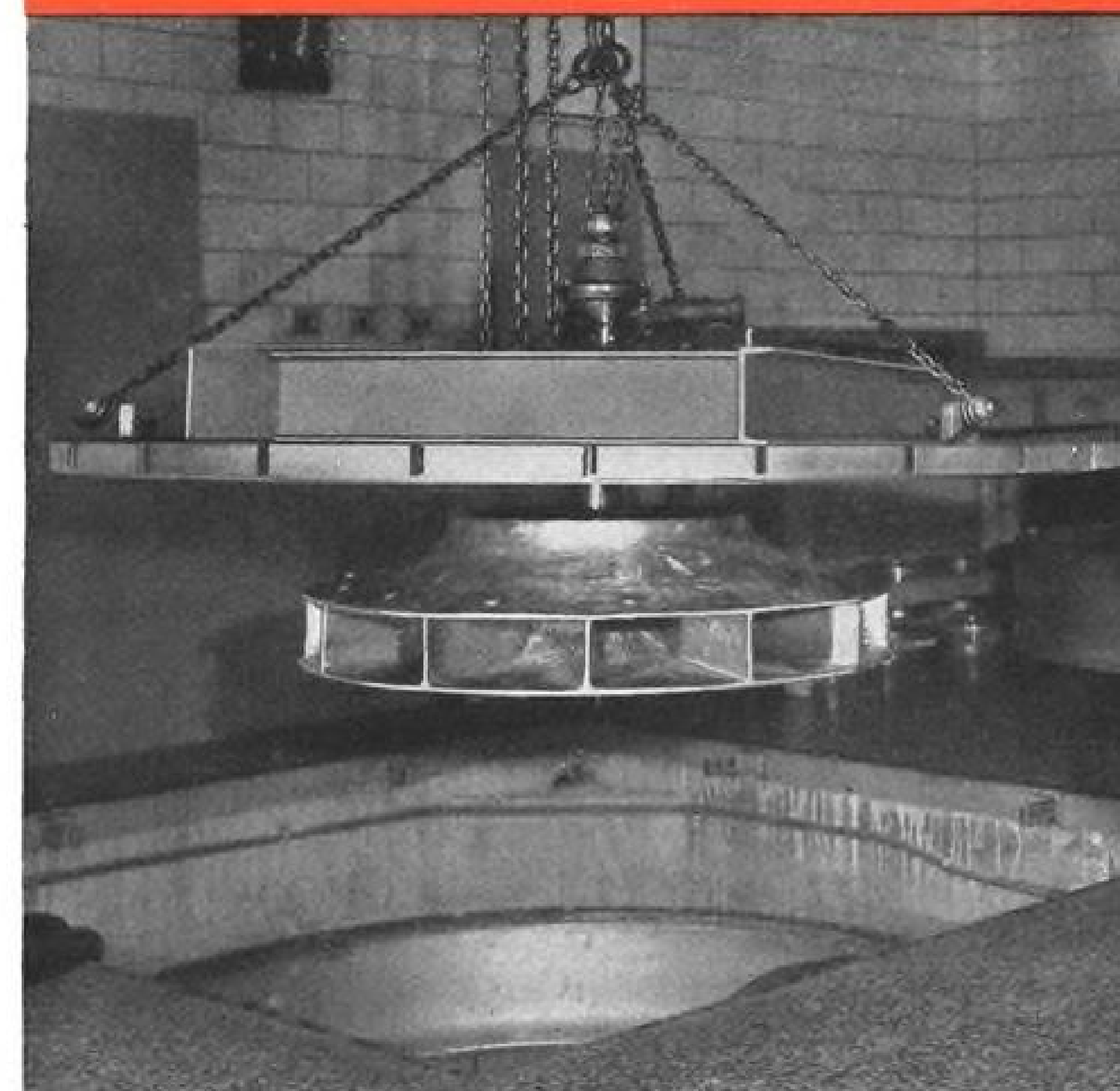
This craft, called the KZ VII Lark, is constructed of fabric with metal tubing fuselage and wings of two spar, wood structure with plywood and fabric covering. It is a high-wing, fixed landing gear configuration similar to the Stinson Voyager, only not as luxurious. Maximum speed is 125 mph.

A noteworthy design feature is a complete leading edge slot with Fowler-type flaps extending over the entire trailing edge of the wing including the aileron portion which acts in combination with the flap through a differential connection to the flap lever. This extensive flap and leading edge combination allows the Lark to touch down at between 20 and 30 mph. with satisfactory stability.

The high lift configuration coupled with the Aeromatic propeller set to utilize automatically 135 hp. takeoff rating permits an exceptionally short take-off run. The cabin seems adequate for four-passenger comfort. The airplane in general is a low-speed, high-utility design aimed at a market similar to that competed for this year by various American manufacturers in the low-price, four-place aircraft class.

► **Design Differences**—In speaking of passenger comfort, a few remarks should be made to amplify the design reasons why some of the foreign aircraft utilize lower horsepower per passenger than American design allows. Some of our concept of passenger comfort comes from our most common means of transportation, the automobile. With this as

Impeller Whirled to Destruction!



"Whirl Pit" is typical of
Alcoa Facilities that
are adding to the sum of
Flight-Metal Knowledge

As the rotating part tends to replace the reciprocating part in aircraft engines and accessories, the question of correct design of impellers and similar parts for high-speed operation is assuming increasing importance.

Aircraft engineers are working with speeds of 30,000 r.p.m. and upward on large-size parts; considering peripheral speeds approaching 12,000 feet per second on parts of all types.

What is the factor of safety in such parts? The answer comes two ways: with destruction tests such as that shown here, in which speeds up to 87,000 r.p.m. have been recorded, or with continued runs well above the required speed of the part, by which safe performance at operating speed is assured. Stress-coating of such parts for experimental runs adds to the designer's knowledge.

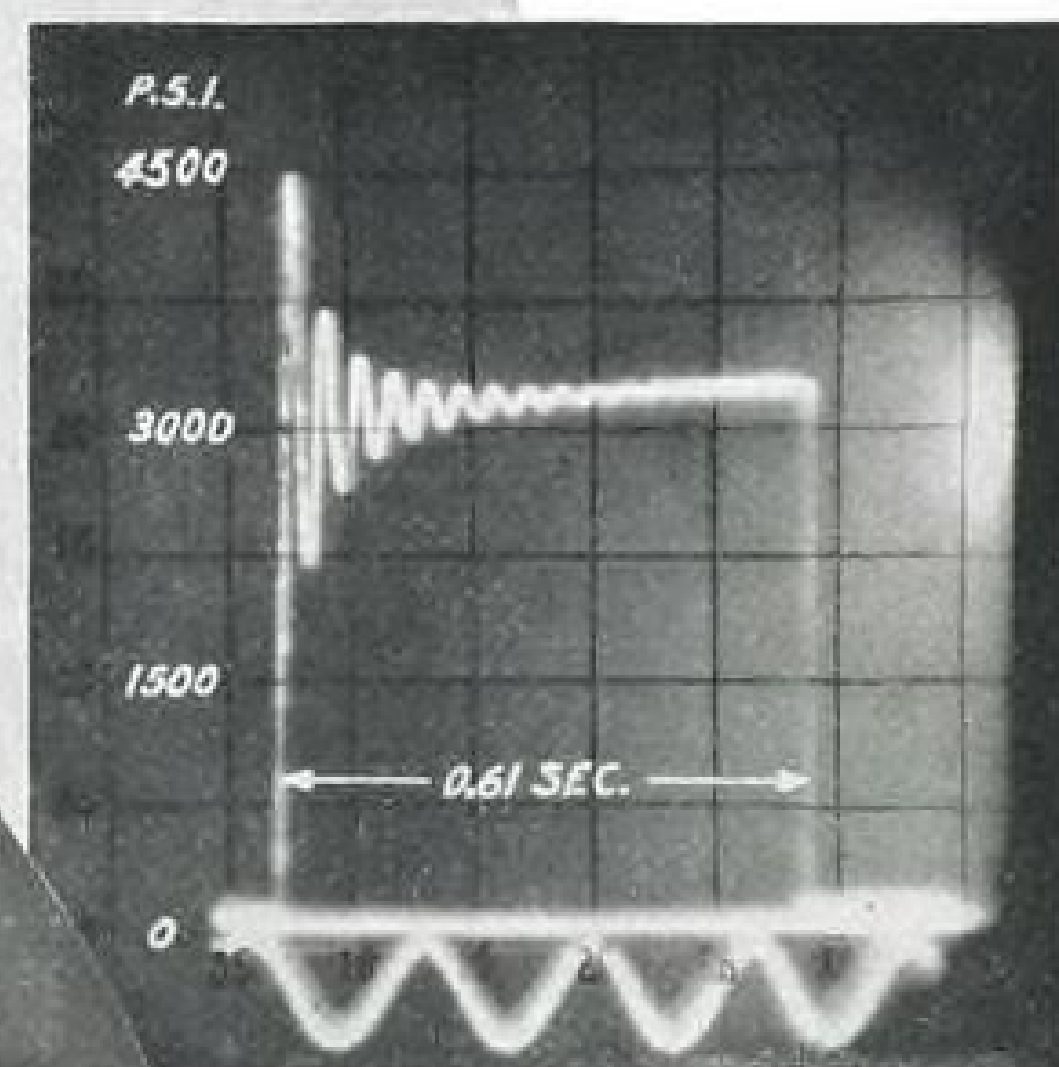
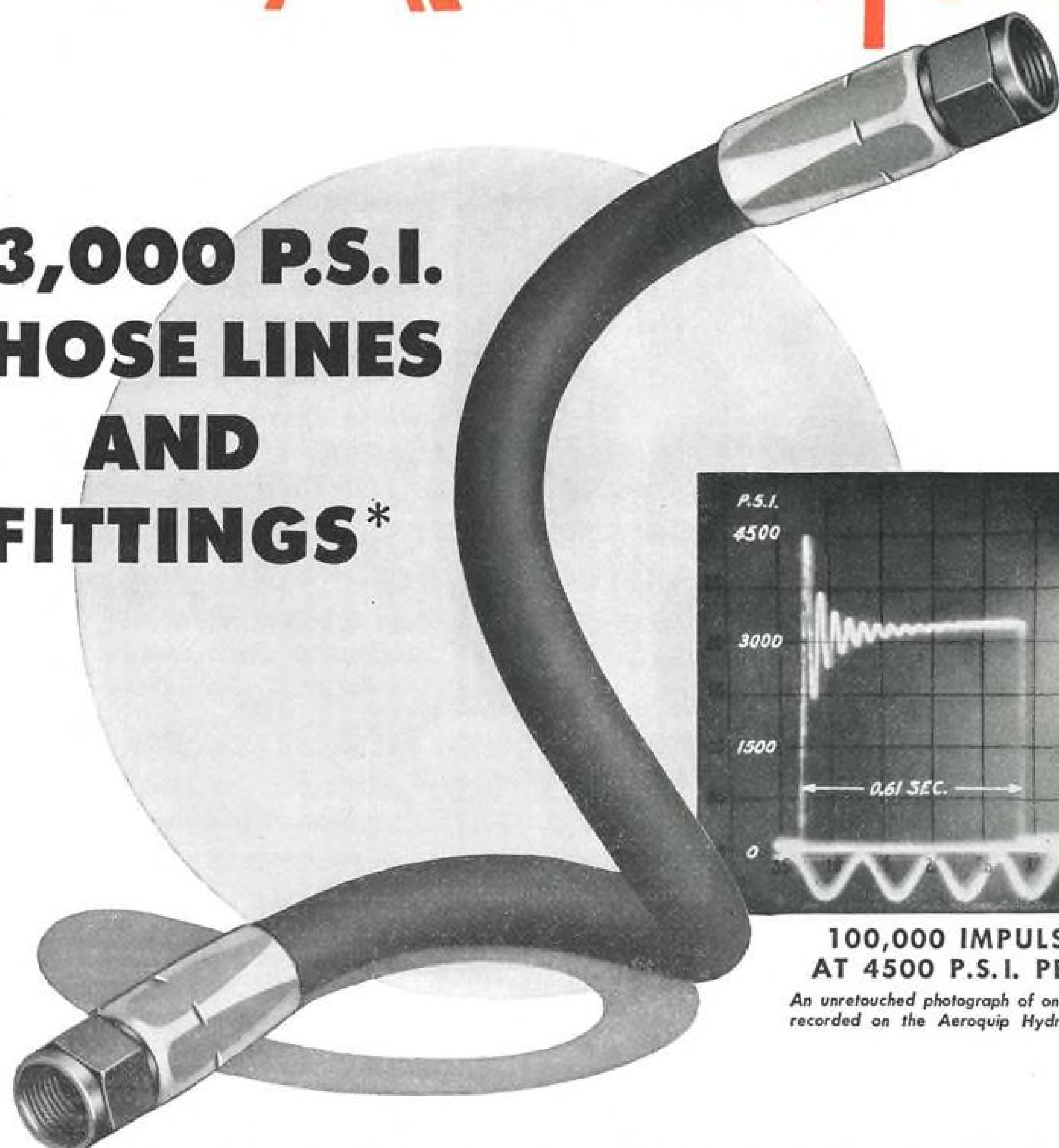
Such tests, and the facilities for them, constitute a part of Alcoa service to an industry to which we have been a major supplier since the days of the first American airplane. Aircraft and accessory manufacturers are urged to make full use of this Flight-Metal Knowledge, and the facilities for obtaining it. ALUMINUM COMPANY OF AMERICA, 2182 Gulf Bldg., Pittsburgh 19, Pennsylvania. Sales offices in principal cities.

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*An unretouched photograph of one impulse
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three pieces, each replaceable. Assembly without special tools. No tightening or adjustment after assembly. Fittings can be removed from hose and re-used over 100 times.

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a comfort criterion, a quick comparison of European automotive design will account for the difference in cubic space allowable for passengers.

The popular European automobiles allow at least one-third less space for the same number of passengers as American design. Examples we are familiar with over here would be the Crosley and the Fiat. In these, the space allowed for a so-called four-passenger accommodation is comparable to that in our coupe model basically designed for two people and with sufficient capacity for three.

In the present stage of private airplane development, we are becoming more conscious of utility, and to achieve it, may be willing to sacrifice high speed and maximum comfort. Actually, on cross-country flights, even in large-area countries like the United States, we do not conceive of ordinary flights of more than three hours duration. This is prompted not only by physical discomfort, but also the nerve fatigue resulting from the unfamiliar condition of noise and vibration.

The predominance of utility in some of the foreign designs may have a strong argument, or, as in the automobile, may only be applicable to foreign aircraft design because of the acceptance of smaller comforts in other means of transportation by those peoples. A trend in this direction is to be noted in the designs by Piper, Aeronca, Cessna, and Luscombe, to mention a few American manufacturers thinking along these lines.

►Sweden—A very attractive three- or four-place, all-metal, low-wing airplane is the "Safir" built by the S.A.A.B. Aircraft Co. in Linköping, Sweden. This company is the largest aircraft manufacturer in Sweden, and is responsible for all military and transport design and aircraft production in that country. Its facilities are equivalent in size and modernization to our larger aircraft constructors.

In the three-place version with 130 hp. de Havilland Gypsy engine, the maximum speed is 146 mph. The fuel tank is located next to the rear passenger seat. The feature of carrying the gasoline in the cabin was incorporated to eliminate complications of wing disassembly. It is intended, under crowded conditions, to dismantle the wings for hanging, and reduce hangar rental. The simplicity of the wing attachment pins and control surface rods is such that actual assembly, with two people, can be accomplished in five minutes.

It is interesting here to see the cognizance given by an aircraft designer to as practical a problem as the cost of hanging aircraft. We have approached the problem from the offset in designs and fabrication of individual hangars to effect lower cost. The approach from

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The Model TE GRANCO will compensate for temperature fluctuations from zero to 220 degrees F., or liquids having a range of .0003 to .0009 coefficient of expansion. It automatically allows for expansion and contraction and computes all measurement back to 60° F.



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vice will last the life of the meter. GRANCO Meters are noted for longevity and sustained accurate performance. The new GRANCO TE Meter has these qualities, plus the unique automatic Temperature Compensator. Send for working drawings, specifications and installation data today!

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Whittaker SLIDING GATE VALVES A NEW VALVE

Off the drafting board comes another Whittaker specialized valve designed for the world's most modern aircraft—the record-breaking jets. Thoroughly tested and proven in flight, these compact shut-off valves control the fiery blast of hot air taken from an intermediate state of the jet engine compressor. This hot air performs vital functions in jet aircraft such as wing de-icing, fuel tank pressurization, windshield defrosting, cabin air temperature and pressure regulation, and ammunition temperature control. This new Whittaker valve, which may be operated electrically or manually, is being installed on virtually all jet-propelled aircraft now under construction by leading manufacturers.

In typical installations, the large 3½" Whittaker Hot Air Valve controls the main compressed air take-off from the jet engine. Then to control the hot air further, smaller Whittaker valves ranging from ½" to 2" in diameter allow the pilot to defrost the windshield, de-ice the wings, etc.

Famous for aircraft valves embodying advanced engineering techniques and design, Whittaker maintains their position as the leader in producing outstanding valves with this new line of Hot Air Valves. For positive control of large volume air flow at high temperatures, Specify Whittaker Hot Air Valves—the newest addition to the Whittaker line.

Whittaker 3½" Hot Air Valve equipped with Whittaker actuator. Power pack conforms fully to AN-M-10a specifications.

BRIEF OPERATING SPECIFICATIONS

Temperatures to 500° F.
Pressures to 125 psi
Sizes, port dia. ½", ¾", 1", 2", 2½", 3 ½"
Flow one direction



Write for your copy of Whittaker "AIRCRAFT VALVES" for information on the hot air valves, slide valves, and other plug and check valves manufactured by Whittaker. Describes and illustrates most popular Whittaker valves and gives operating specifications.

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CONTROL HOT AIR IN JET AIRCRAFT FOR A NEW SERVICE

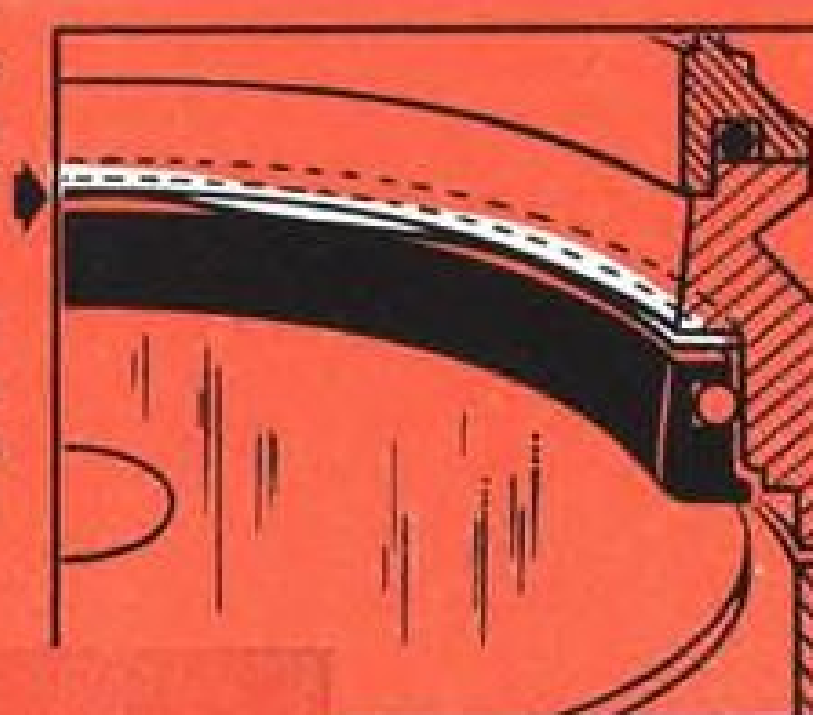


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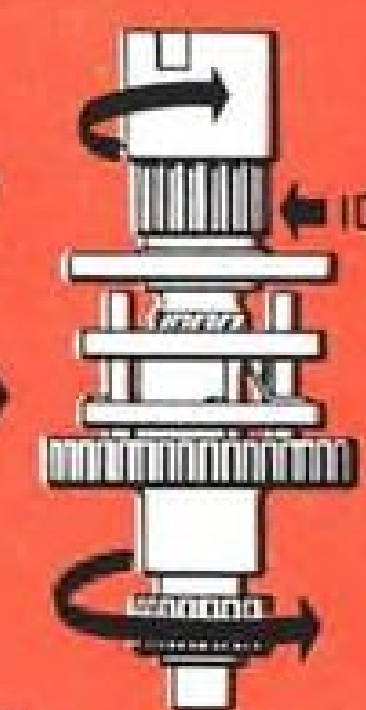
OUTSTANDING DESIGN FEATURES

COMPOUNDED SEALS—Special heat-resistant sealing rings provide a positive shut-off at 500° F. and 125 psi, with leakage of less than one per cent of maximum rated flow.

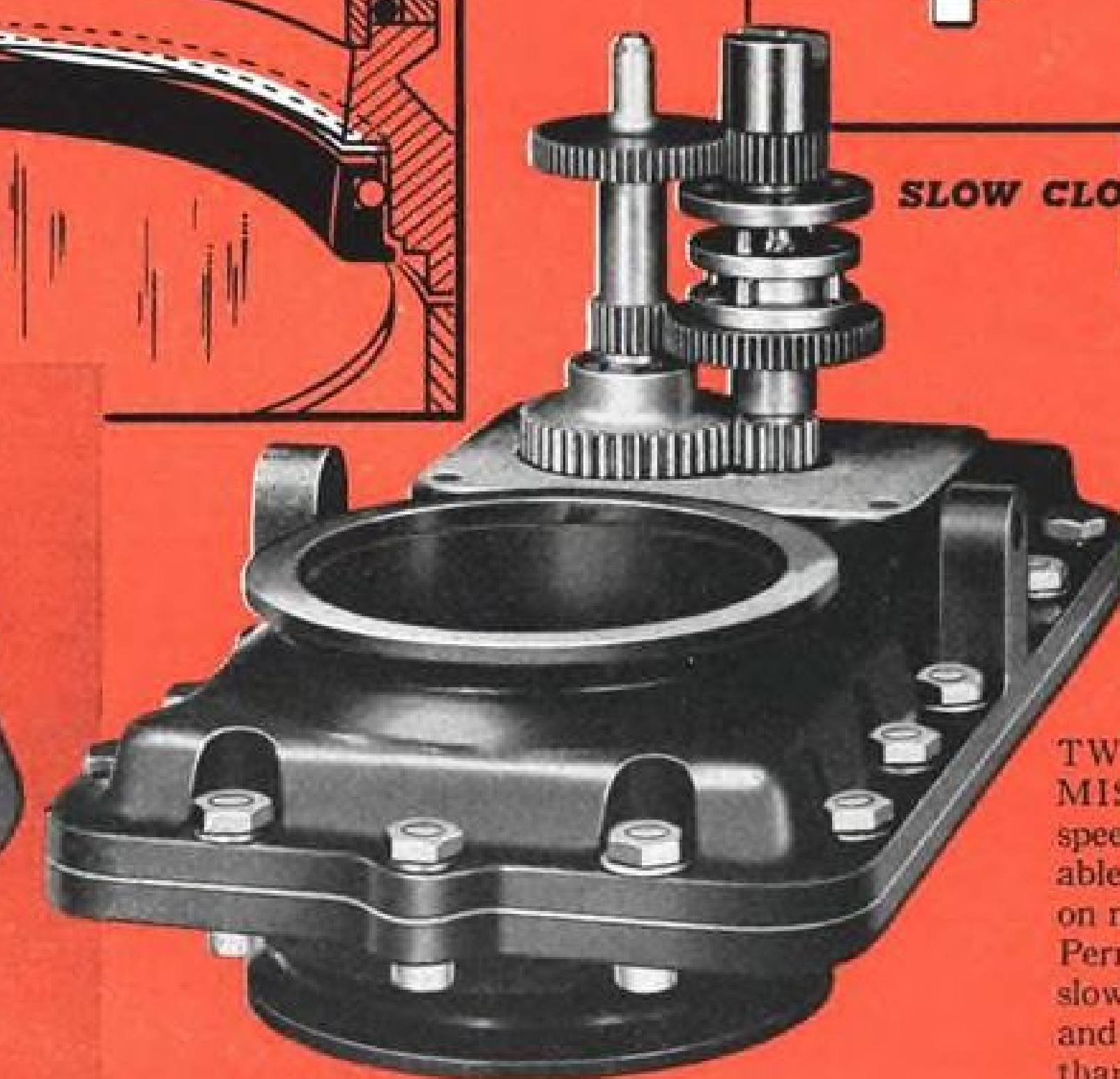
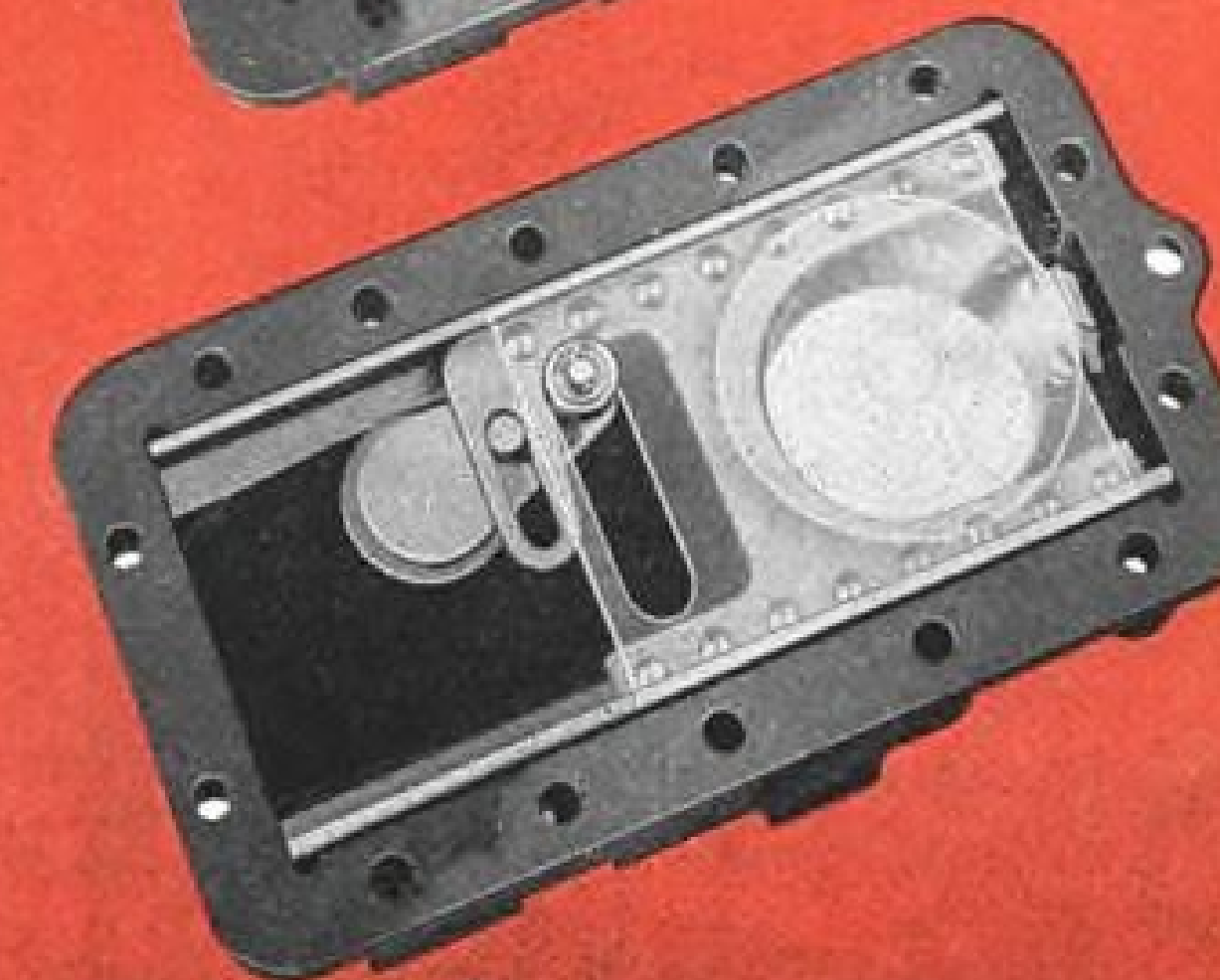
POSITIVE, LOW-TORQUE SLIDE OPERATION—sliding gate operates on ball bearing supported track. This assures smooth, easy operation regardless of port size or operating pressure.



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A useful guide to better results with **Stainless**

Here in convenient form we have condensed the essential facts about the various grades of U-S-S Stainless Steel that will assist you in determining broadly which is most suitable for your needs. Keep in mind, however, that this chart merely indicates general characteristics and basic applications.

To get optimum results from these service-tested Stainless Steels, any fabricator, and especially any one contemplating the use of Stainless for a new

product, should obtain expert advice in its selection and fabrication. This we are prepared to furnish.

Our Stainless engineers are specialists in the use of these materials. Ask for their cooperation. You'll find their suggestions practical and extremely helpful not only in determining the grade of U-S-S Stainless that will do the best job for you, but in showing how it can be handled most efficiently on your equipment.

15 types of U-S-S Stainless Steel to choose from

grade	characteristics	when or why used	forms available
U-S-S 18-8 Type 302	Excellent corrosion resistance.	General all-purpose grade for food, dairy, chemical, and architectural uses.	SHEETS are supplied in plain or polished finishes which are standardized. They are designated as: No. 1—Hot Rolled, Annealed, and Pickled; No. 2D—Dull Cold Rolled; No. 2B—Bright Cold Rolled; No. 4—Standard Polish on either One or Both Sides; No. 6—Tampico Brushed; No. 7—High Luster Polished.
U-S-S 18-8 S Type 304	Carbon is limited to 0.08% maximum.	For applications similar to U-S-S 18-8 Type 302, but offers superior corrosion resistance in weld-affected areas.	
U-S-S 18-8 Ti Type 321 U-S-S 18-8 Cb Type 347	Similar in general corrosion resistance to U-S-S 18-8 and U-S-S 18-8 S. Stabilizing additions immunize corrosion attack of heat-affected areas.	High temperature service, 800°F to 1600°F. For severe corrosion conditions in welded assemblies which cannot be subsequently annealed.	
U-S-S 18-8 Mo Type 316	Exceptional corrosion resistance, improved creep strength.	Severe corrosive conditions, particularly those involving pit-type corrosion.	STRIP is supplied to ordered requirement in coils or straightened and cut lengths. It should be ordered to a decimal thickness, with width and finish to suit the particular application.
U-S-S 18-8 FM Type 303	Galling and seizing reduced, machining greatly improved.	Gears, valves, bolts, screws, or other machined products.	
U-S-S 25-12 Type 309	Exceptionally stress resistant at high temperature exposure.	In service where temperatures up to 1900°F are encountered.	PLATES AND BARS are furnished hot rolled, annealed, and pickled; bars are also furnished cold finished, centerless ground, or polished. Special sections and plates are furnished with pickle finish and require coarse abrasives in preliminary grinding, where a polish is desired.
U-S-S 25-20 Type 310	Offers superior resistance to oxidation.	Applied where very high temperatures are involved.	
U-S-S 17 Type 430	Good corrosion resistance.	Automotive and interior architectural trim; some specific chemical applications.	
U-S-S 27 Type 446	Limited formability, generally not adapted to severe drawing. Excellent scaling resistance.	Primarily used at high temperatures up to 2000°F for static parts not subjected to high stress.	TUBULAR PRODUCTS are furnished in most popular grades of U-S-S Stainless Steel. A variety of finishes are obtained by grinding and polishing cold drawn, annealed, and pickled tubing.
U-S-S 12 Type 410	Martensitic grade, strengthened by conventional heating and quenching.	Engaging mechanical parts, such as pump rods and valves.	
U-S-S 12 Turbine Type 403	Composition basically same as U-S-S 12.	Modified analysis suited for turbine blades and similar application.	ROUND WIRE is available in coils within a size range of .5" to .005" inclusive. Straightened and cut material is limited to .030" and coarser. Finishes available include pickled, metallic coated, oil, diamond, and soap drawn, ground, and polished. A variety of cold heading wire, spring wire, weaving wire, armature binding wire, and wire rope are also available in stainless steels.
U-S-S 12 AL Type 405	Composition basically same as U-S-S 12.	Modified analysis for applications requiring field welding where air-hardening cannot be corrected by heat treatment.	
U-S-S 12 FM	Added elements give extra machinability over U-S-S 12.	Used for valve parts and other articles made on automatic machines.	
U-S-S 5 Type 501	Welding hardens; annealing restores ductility.	Used in petroleum industries for strength, and resistance to corrosion and oxidation at moderately high temperatures.	
U-S-S 5 S Type 502	Basically same as regular U-S-S 5.	Modified analysis reduces tendency to weld-harden.	

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
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UNITED STATES STEEL

the aircraft design standpoint is a new one, and when reduced to the refinement and simplicity achieved by S.A.A.B., may be worthy of consideration by American aircraft builders.

► **Resemble U. S. Type**—The outward design characteristics of the Safir closely resemble the new Fairchild low-wing Model F-47. Design is all-metal with the conventional bulkhead and stringer fuselage. The single spar cantilever wings are metal covered in front of the spar while the rear portion is fabric covered. The wing is tapered, has square tips. Washout is considerable. Each wing is attached to the fuselage by two wing bolts, one vertical and one horizontal. Automatic wing joint coupling of the flap and aileron control rods, as well as the pitot tube, insure rapid and easy wing disconnection.

The export version of this airplane is contemplated with the use of an Aero-matic propeller and a 190 hp. Lycoming engine with an estimated 170 mph. maximum speed. In this version, the gas tanks will probably be put in the wings to allow for the fourth passenger.

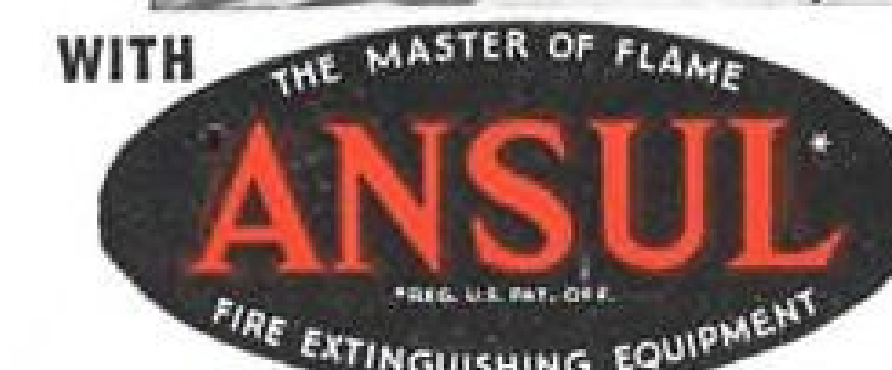
The undercarriage is tricycle and is mechanically retracted by a lever. The balance on the lever arm during the entire arc of its swing is achieved by a very simple but ingenious engineering application of a coil spring, the uniform tension of which is maintained by a roller on a cam track. The handle of the lever is spring-loaded in a torque direction to actuate gear lock pins.

The functional ease of this retractable lever mechanism together with its positive mechanical action could well be imitated by American aircraft manufacturers for this horsepower aircraft. Elimination of hydraulic and electrical systems with their inherent potential power failures would ease the minds of many pilots who have found themselves hung up and sweated out a belly landing.

At the time of my visit, this firm had built fifty of such airplanes and had sold forty, and in the production line in various stages of completion were about twenty-five more. The projected production plans will depend on the market reaction to the ship.

► **New Fokker**—In Amsterdam, The Netherlands, I had the pleasure of flying the Fokker "Promoter" four-place, twin-boom, pusher airplane. This design configuration has been flirted with by four principal American aircraft builders; but for various reasons, such as difficulty with rear engine installation, cooling, and performance, they have dropped the idea of present production. The obvious inherent advantages, however, in this type of aircraft design are such that it is believed that other American attempts will be made in this direction. Some American experiments on this design have been made by Con-

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Swiss Pilatus five-place utility plane.



Morane-Saulnier's Model 571.

a Lycoming 190 hp. engine and Aero-matic propeller, represented the characteristic design similar to our Navion.

Significantly here was another military constructor using a sliding canopy for cabin entrance. The lines and detail were very pleasing and comfortable. A bimotor version of this airplane with the contemplated use of two 190-hp. engines represented a high utility design with ample payload space to allow its use for general charter, feeder, ambulance, or executive transport.

A bimotor in this horsepower range was interesting to see because it represents a gap still unfilled by American design but necessarily an ultimate design that we shall some day have here. For comparable purposes, we do not have an American design of an executive transport allowing bimotor safety for instrument and night flying this side of a Beech Model 18 at around \$60,000.

► **Nord Design**—The next French firm visited was Societe Nationale de Constructions Aeronautiques, du Nord, 20 Rue Vernier, Paris, which is the producer of Norecrin Model Nord 1200.

This is a three-place, all-metal, low-wing, tricycle retractable landing gear airplane which has won several performance prizes in French competition. This remarkable little business-and-touring plane carries three people at 165 mph. with a 140-hp. engine.

Flight tests have just been completed on this ship with the Continental 125-hp. engine and Aero-matic propeller. The maximum speed with this lower horsepower engine is 152 mph. Compensation for the reduced speed is less fuel consumption and longer range.

A unique construction feature is the use of an externally pressed dural skin instead of the conventional internal stiffener. Apparently from the performance, this type of external reinforcement does not create prohibitive drag.

Airplane performance of this sort commands respect for foreign abilities. This plant is owned and operated by the French Government.

The Societe Industrielle Pour L'Aeronautique, abbreviated S.I.P.A., at 29 Rue de Pont, Neuilly-sur-Seine, is a nationalized factory which has presently produced a model known as the S-91. This is a two-place airplane. The export version is equipped with the Continental 85-hp. engine with Aero-matic propeller as standard equipment.

This airplane resembles the prewar Culver Cadet in its construction and configuration. Its flight characteristics were also similar, with the same degree of sensitive control forces on the movable surfaces. The level flight speed is 125 mph., with a climb of 630 fpm.

► **Switzerland**—In a picture-postcard location at the base of a snow-capped mountain range in Switzerland, the

controls of this ship are sensitively balanced; and the stability, both lateral and longitudinal, are apparent in all attitudes of flight. The standard production model of this airplane is equipped with Lycoming 190 hp. engine and the Aero-matic propeller. Production planning for this aircraft is underway, and it is probable that many of these models will be in use this year.

► **France**—In France, the aircraft plant of Morane-Saulnier at 3 Rue Volta-Puteaux (Seine) was visited. This firm is one of the oldest French builders of airplanes, both commercial and military. They have several popular class airplanes in progress and are interested in procuring American power plants and propellers, most particularly for the models they intend to export.

Some of their prototype designs include a single engine, low-wing, fixed landing gear airplane of about 40 hp. and a two-place version of a similar design with approximately 65 hp., known as the Model 600. Apparently the item of cost was of primary consideration in these two models as these designs were very basic and much more productive than pretty.

The more advanced models, like the M.S. 571, a three-place, low-wing, tricycle retractable landing gear, powered with 140 hp. Renault engine, and its projected four-place export version with

solidated Vultee, Kaiser, Puget Pacific with their Wheelair, and Bendix in Detroit.

Having followed progress on American prototype attempts using the Aero-matic propeller, it was interesting and somewhat surprising to see one successful answer to the sundry problems that restricted American continuation of this design.

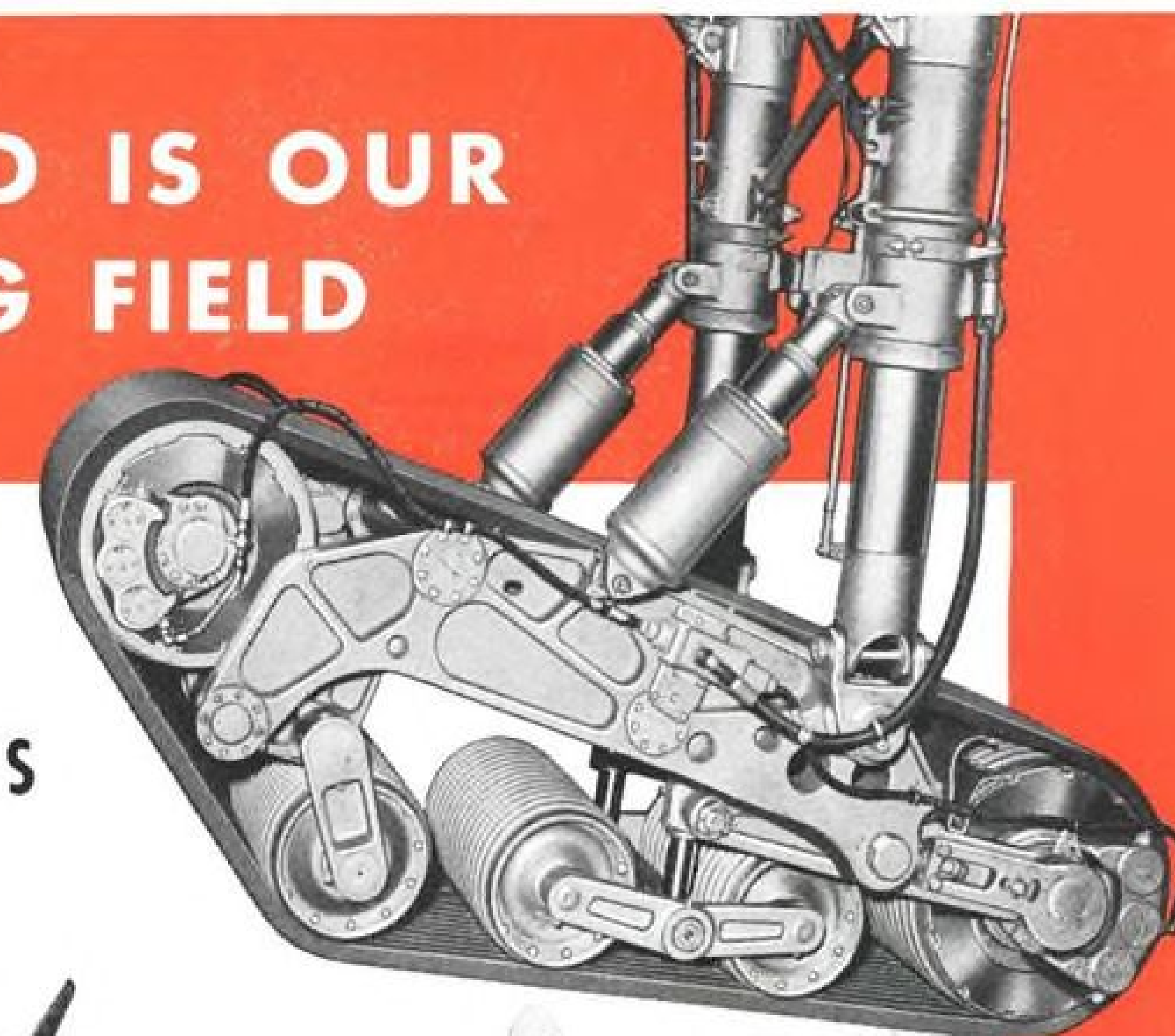
M. Beeling, vice president and director of engineering for Fokker, reiterated many of the steps taken by American manufacturers, such as changes in size and location of air intake, crankshaft extension for best location of propeller and to eliminate induced torsional crankshaft vibration, and general streamlining studies to produce an efficient laminar flow over the fuselage contour. Benefits of increased visibility and engine accessibility are apparent.

The ship is all-metal construction with retractable tricycle landing gear. One oddity exists in the seating arrangement with the pilot seat forward and a seat accommodating three passengers in the rear. This arrangement evolved itself and was dictated by the resultant C. G. location.

The estimated level flight speed of 135 mph. was substantially exceeded by the prototype which was consistently doing better than 140 mph. The con-

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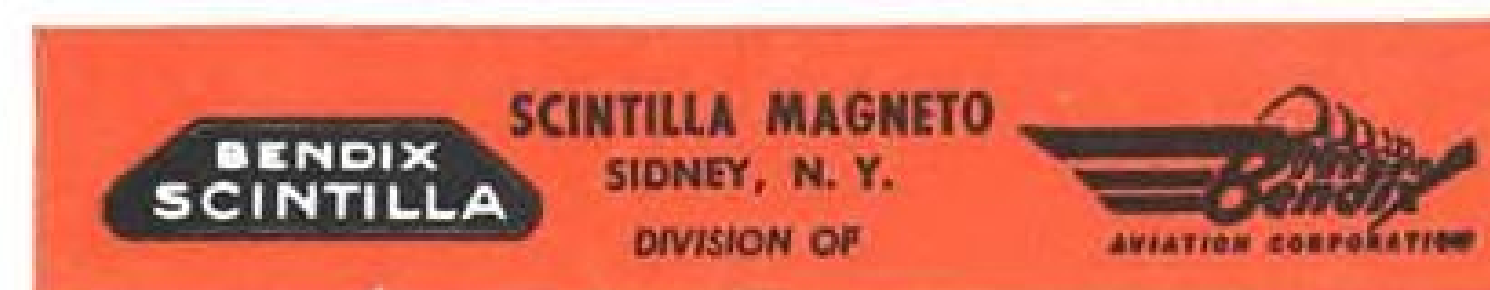
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Pilatus Aircraft Works, Ltd., Stans, is engaged in the manufacture of various types of military aircraft for the Swiss Air Force and had in its plant some confiscated German trainers that had been converted for Swiss training purposes.

Its latest design venture is a five-place utility airplane which had not yet been flown. The power plant was 190-hp. Lycoming with the Aeromatic propeller. No performance figures were issued because no initial flight tests had been made. However, the estimated rate of climb is 1820 fpm. A landing speed of 50 mph. is another target.

The emphasis here is again for utility rather than speed, to give the vehicle a commercial value in carrying loads over mountainous terrain, thereby greatly reducing transportation time as against the circuitous path necessarily taken by the automobile or the train. Since the country is small, greater speed at the expense of useable load would not be attractive to commercial operators. This design consideration is characteristic of countries having mountainous terrain and small total areas.

Also in the design stage is a low-wing, two-place craft being submitted as a primary trainer design for the Government Air Force by Dornier-Werke, Altenrhein bei Rorschach. This ship is contemplated with the use of a 125-hp. Continental engine with Aeromatic propeller. The ship has an estimated level flight speed of 140 mph.

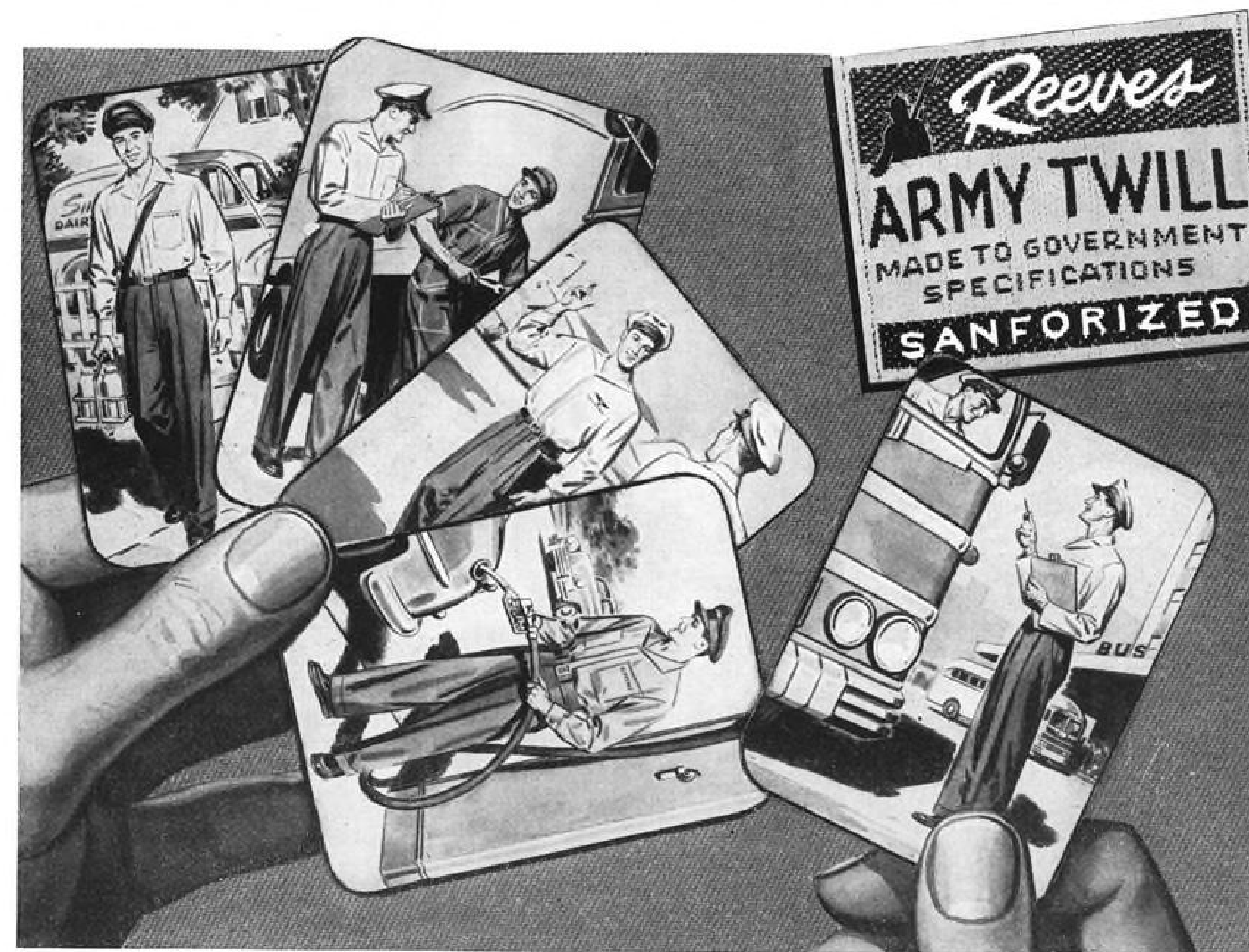
► U. S. Equipment—It was gratifying and comforting to find so much evidence of American accessories incorporated in the designs of these foreign airplanes. The lower cost and greater establishment of international service facilities make American equipment most desirable. Were it not for the economic restriction on the dollar, most engines and other accessories in the lightplane field would be of American manufacture. The greatest difficulty in doing a sizeable business in this part of Europe is the exchanging of funds.

Another question which has been asked has been the comparison of price. Roughly speaking, because of the various fluctuations in the exchange, the comparable foreign aircraft costs twice as much in American dollars. On a comparative basis, their automobiles range from two to two and one-half times our cost.

This is attributed basically to the lower market potential and, consequently, lower production rate facilities for manufacturing. The only semblance of a moving belt production that I found evidence of was in connection with military aircraft. No such provisions were seen for any of the private plane factories visited. The volume estimates range anywhere from 10-25 percent of ours.

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The Reeves fabrics in the designs shown were recently publicized in LOOK Magazine. Designs are by Helen Cookman. Patents applied for.

LONG-LASTING economy is "in the cards" when you specify Reeves Army Twill for your industrial uniforms. The high tensile strength of this top-quality fabric assures years of rugged wear.

Reeves Army Twill tailors beautifully—which means better employee appearance, greater comfort. These are important assets towards boosting employee morale and increasing public good will.

Reeves Army Twill comes in a wide range of vat-dyed colors fast to sun, water and perspiration. It withstands repeated washings... its residual shrinkage is less than 1%. Remember—over 90 million yards of this same fabric helped equip America's fighting men—exceeded Government specifications under the toughest climatic conditions.



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AVIATION WEEK, September 20, 1948

NEW AVIATION PRODUCTS

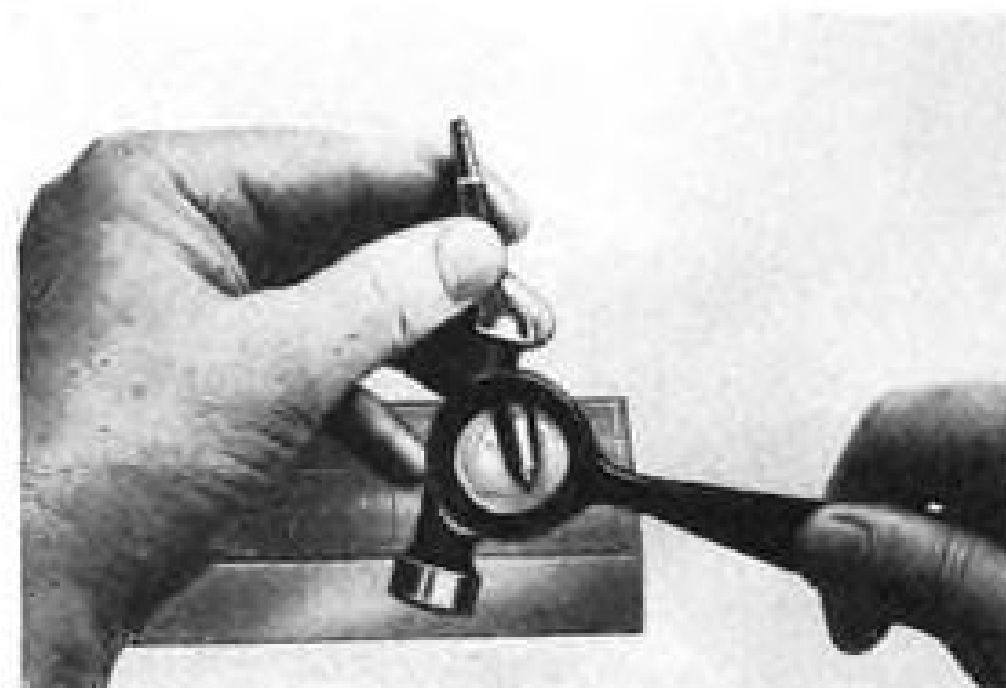


For Tough Tire-Removal

One-man-operated tire dismounter employing hydraulic pressure to afford quick and safe removal has been released for manufacture by **Institute of Inventive Research**, 1804 Milam Bldg., San Antonio, Tex. Mechanism, adjustable to tires of almost any size, breaks bead through exertion of pushing pressure from one side of wheel and pulling pressure on other side. After test-proving at Slick Airways, involving 200 dismountings, unit is reported to save 7 man-hours per tire change.

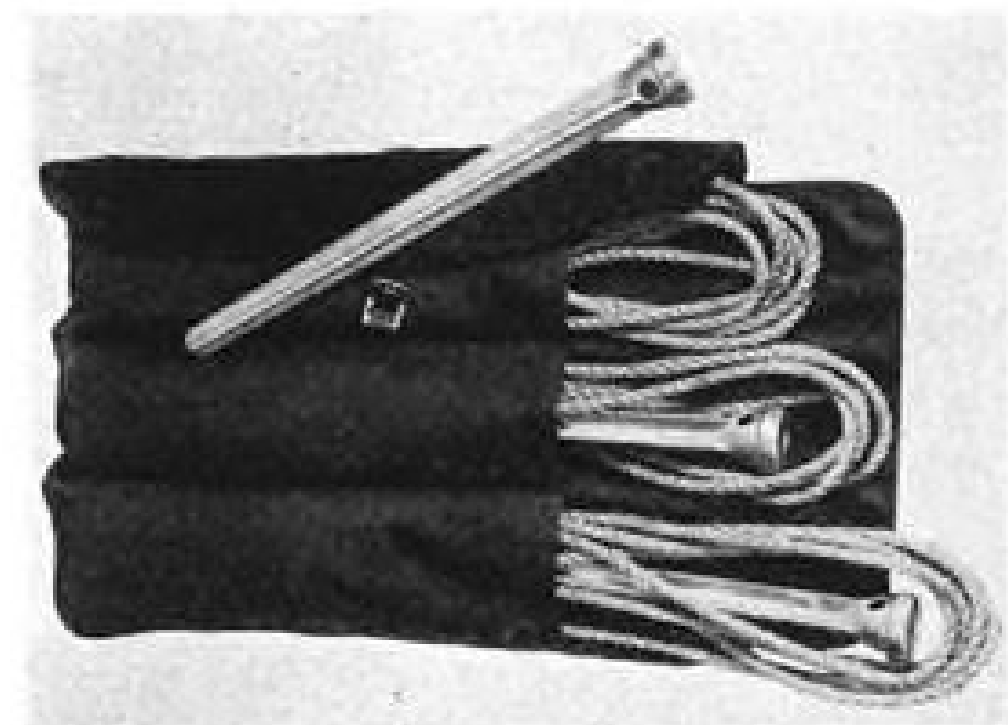
New Transducer

Precision electric-signalling device for use with telemetering system in flight testing and control of pilotless aircraft is produced by **Kollsman Instrument Div., Square D Co.**, 80-08 45th Ave., Elmhurst, N. Y. Transducer is reported to show no changes when subjected to vibrations having frequencies between 8-30c./sec. with amplitude of .0625 in., and between 100-300c./sec. with .005-in. amplitude. Temperature compensated, two types of units are available: Varying resistor relying on d.c., and a.c. induction type. Each is available in either absolute or differential pressure models in various ranges.



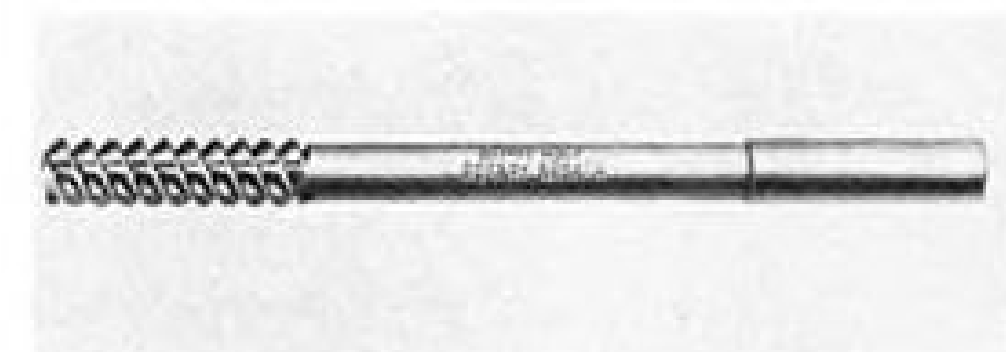
Hammer Magnifies

Accurate spotting and punching of centerlines and other intersections is simplified by tool-and-die-makers' hammer introduced by **L. S. Starrett Co.**, Athol, Mass. Built into hammer head, seven-power lens enables precise punch-spotting without removing eyes from work. Hammer, made from steel forging with flat and ball peen heads, weighs only 4 oz. Heads are offset to permit use in corners or close to obstructions.



Mooring Kit

Lightweight, compact mooring kit for securing private planes is marketed by **Air Associates**, Teterboro, N. J. Weighing 4 lb., it can be carried in luggage compartment. Complete outfit comprises three cast aluminum alloy stakes and three ropes in folding leathette or canvas bag. Stakes are 15 in. long, with star drill point. Ropes are 1/8 in. No. 1 manila, with tensile strength of 1000 lb., served at both ends to prevent unraveling and make threading through stake holes easy.



Blind Hole Broach

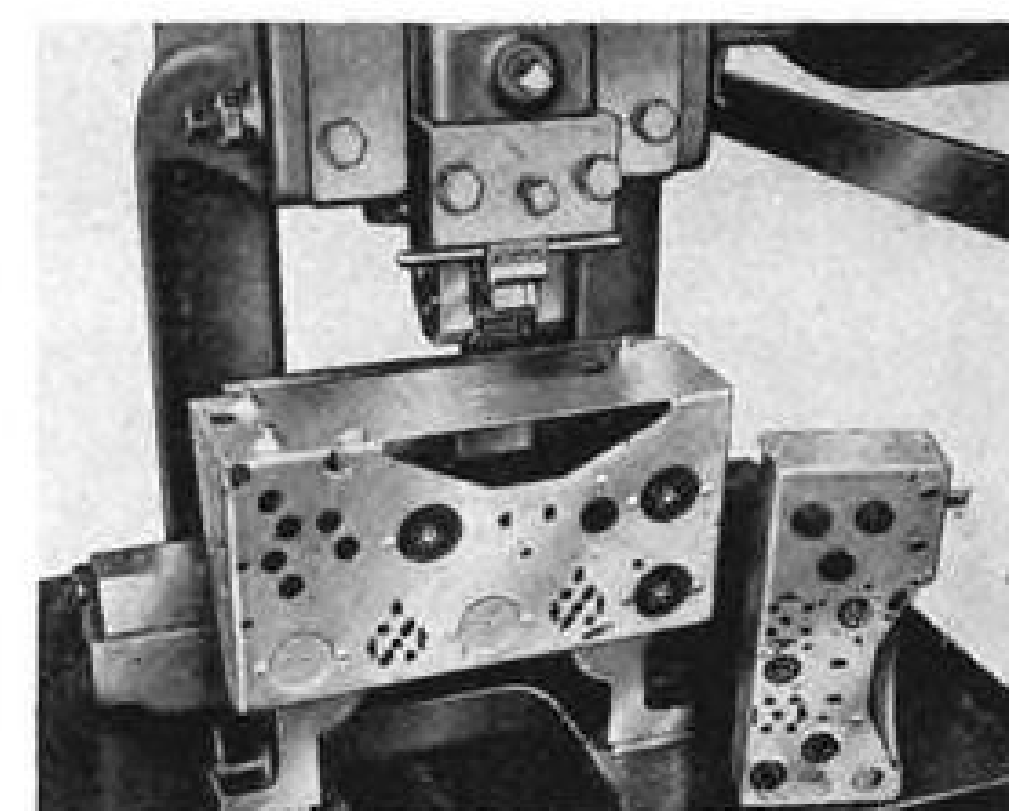
Intended to replace reamers and eliminate second broaching operation, blind hole rotary broach stated to produce holes within accuracy of .0001 in. is made by **Shearcut Tool Co.**, Box 746, Reseda, Calif. Helical cutting flutes are right handed, causing chips

removed to be fed out of blind hole. Stock sizes are from 1/8 to 1 in., in 1/16-in. increments, and from 1 to 1 1/2 in., in 1/4 steps.



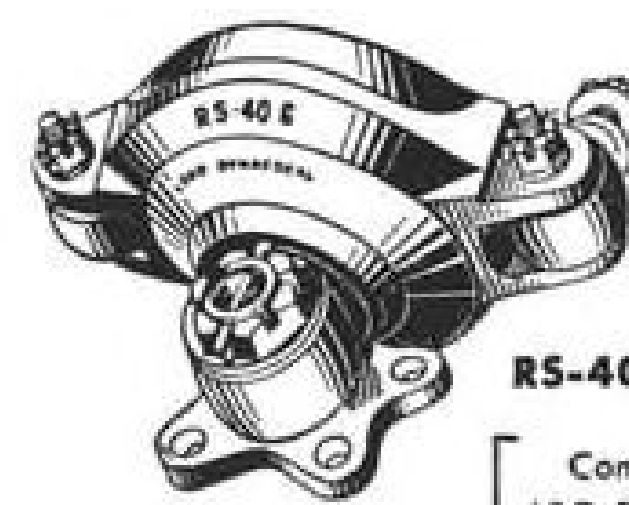
Converts Standard Headset

Headset-microphone combination from a plain headset is afforded via microphone kit made by **Flight Research Engineering Corp.**, P. O. Box 1-F, Richmond, Va. Kit contains noise-canceling lip microphone attached to hollow stainless steel boom, aluminum pivot, pivot bracket, and two-prong plug. Cable assembly with push-to-talk switch for wheel installation is also provided and has necessary connectors for plugging into any aircraft radio. Boom assembly and microphone weigh under 4 oz.



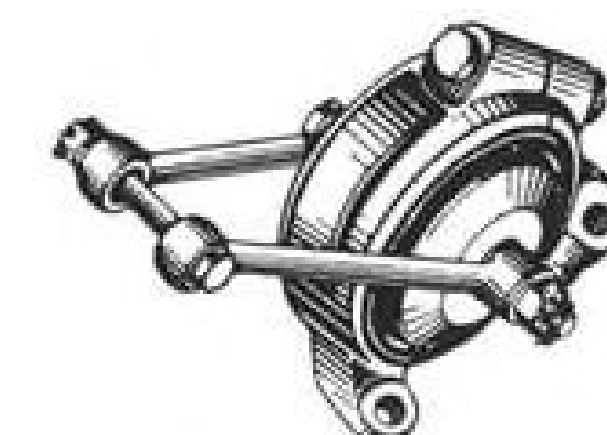
Stamps Metal

Adaptable for use in numbering of instrument and radio chassis is adjustable stamping fixture announced by **Acromark Co.**, 306 Morrell St., Elizabeth 4, N. J. Fixture carries adjustable steel slide blocks, permitting stamped part to be numbered on end and side in two successive press strokes. For duplicate numbering, other fixture is added for operating actuating arm of numbering head. Device holds stamped parts having one or more flat surfaces ranging from 1 x 2 to 4 x 10 in.



RS-40G ASSEMBLY

Consists of six RS-40G-SA sub-assemblies
For **LOCKHEED "CONSTELLATION"**
DOUGLAS AD-1 & AD-2
MARTIN "MARS" (JRM-1)
Using **Wright R-3350-C188B**
and **C188D** Engines

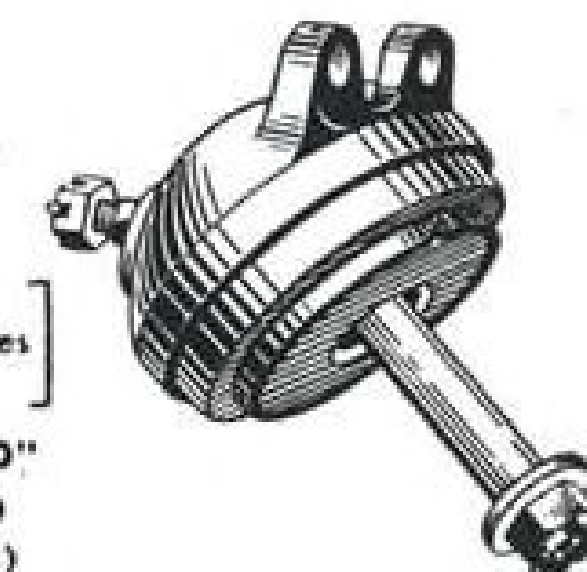


RL-35 ASSEMBLY

Consists of nine RL-35-SA sub-assemblies
For **LOCKHEED "CONSTELLATION"** Using **Wright R-3350**
A & B Series Engines

MR-36 and MR-36F ASSEMBLIES

Consist of six MR-36-SA; six MR-36F-SA sub-assemblies respectively
For **CONSOLIDATED "240"**
CURTIS CW-20 (C-46)
DOUGLAS DC-6 (C-112)
MARTIN 202



Using **Pratt & Whitney R-2800 A & B Series Engines**, use **MR-36**;
Pratt & Whitney R-2800C Series Engines, use **MR-36F**

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Follow the lead of companies like Lockheed, Martin and Douglas who use Lord Dynafocals as original equipment... you'll get better vibration isolation, longer service life and lighter weight.

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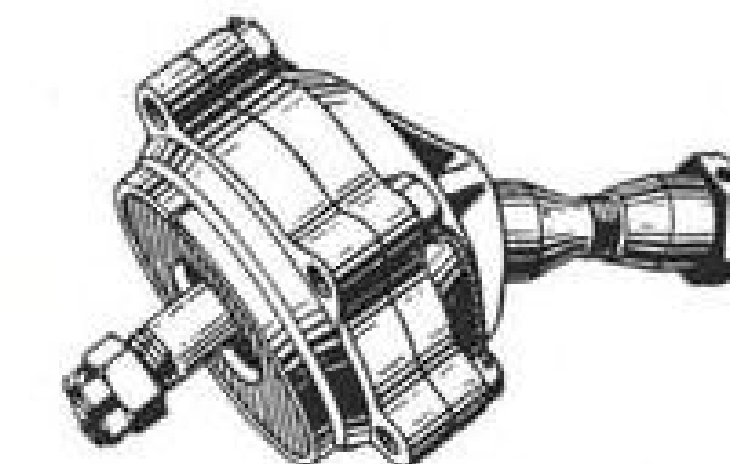
- **Smoother flight**—flexible center-of-gravity suspension means maximum vibration isolation.
- **Low weight**—careful design and stress analysis assures minimum weight.
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- **Easy installation**—metal parts are interchangeable due to precision construction methods.

Write for a copy of Lord Service Bulletin containing valuable information on maintenance problems, suggestions for increased service life, and parts list. Mention engine or mounting in which you are interested.

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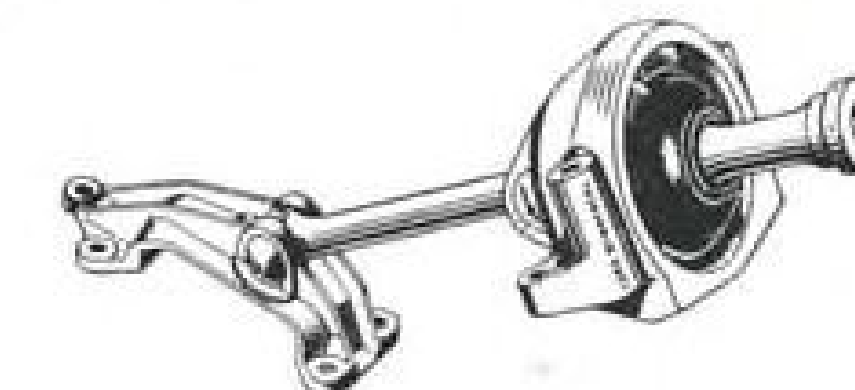
New York • Detroit • Dayton • Washington
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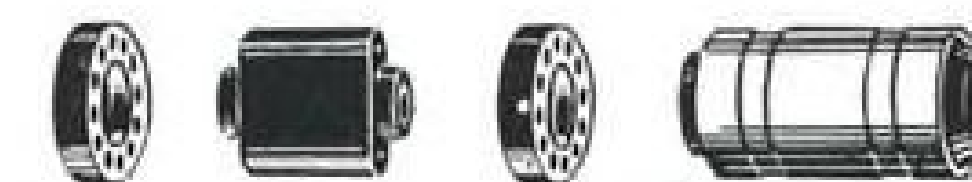
MR-26 ASSEMBLY

Consists of eight MR-26-SA sub-assemblies
For **DOUGLAS DC-4 (C-54)**
Using **Pratt & Whitney R-2000**
Series Engines



MR-40D ASSEMBLY

Consists of seven MR-40D-SA sub-assemblies
For **BOEING 377**
BOEING B-50
DOUGLAS C-124
MARTIN P4M1
MARTIN AM1
FAIRCHILD C119



LORD ENGINE MOUNTINGS for DC-3

Item	P & W 1830 Series		Wright 1820 Series	
	Quantity Per Plane	Part Number	Quantity Per Plane	Part Number
Tube Mounting	8	J 1202-1	8	H5013-3
Insert	16	J 1789-1	18	SK1925-1
Sandwich	32	SK1292-1	36	SK1292-2

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COWL MOUNTS

Protect cowls against shock, vibration, and engine expansion with Lord Tube Form Mounts, illustrated. Use these, too, for flap-jack joints—wherever flexible joints are required.



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Specify Lord Multiplane Mounts for isolation of vibration from all directions. Lord Plate Form Mounts (shown above) also available for replacement.

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Westinghouse research creates new developments for aircraft . . . new opportunities for you

A new era for aviation . . . and new opportunities for you; these are the products of a Westinghouse research program devoted to aircraft. Vast in scope, Westinghouse research involves hundreds of men . . . armed with modern scientific tools . . . in a number of laboratories. This activity has already produced many developments which have benefited aviation—and you—by creating new opportunities in plane design . . . new ways to improve plane performance.

As this work continues, further important developments appear. A few of these, which promise great forward strides in air progress, are discussed on these pages. And Westinghouse will continue to explore new and better methods of solving the problems of aviation.

J-94768



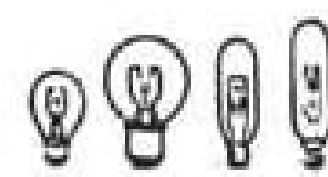
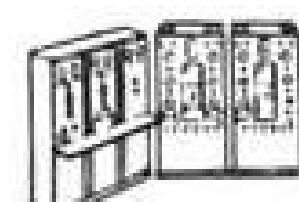
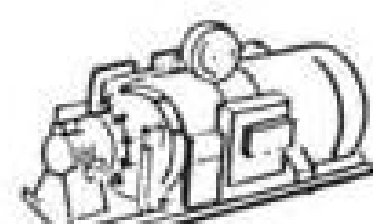
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Leader in Aviation

Equipment

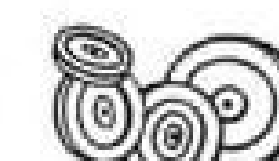
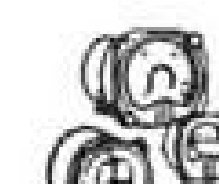
ON THE GROUND

ENGINE STARTERS • BATTERY CHARGERS • AIRPORT LIGHTING • TEST EQUIPMENT • RADIO AND MICROWAVE APPARATUS • LAMPS



AIRBORNE

ELECTRICAL EQUIPMENT • INSTRUMENTS • MICARTA PULLEYS • STRUCTURAL PARTS • FANS, HEATERS, COOLERS • JET PROPULSION

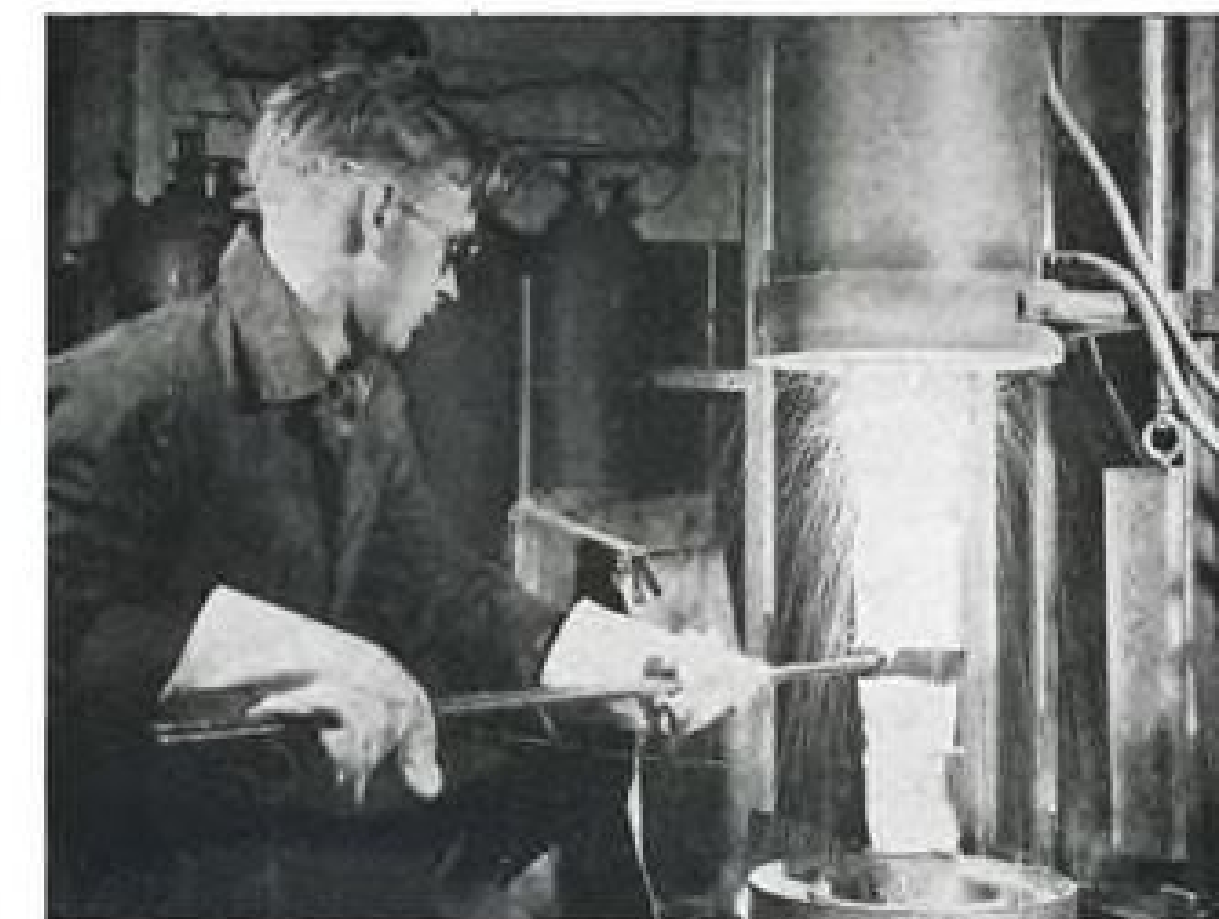


A Super-Fine Fuel Atomizer. Here's a product of Westinghouse research that solves an old problem in fuel combustion—that of imperfect combustion and resultant carbon formation in fuel chambers. It's a new fuel nozzle for aviation gas turbines that provides a spray so fine that superior distribution and greater combustion efficiency are obtained over the entire speed range. This means more power per gallon of fuel, less maintenance and new economy in aircraft operation. The difference between the old and the new is dramatically evident in the photo at the right.



High Temperature Metallurgy. Of enormous consequence to gas turbine engines, jet propulsion and superchargers are recent Westinghouse developments in high-temperature alloys—Refractaloy and Discaloy. These are not just two alloys, but a family of metals having high strength at high temperatures. Exact proportioning, precise annealing and careful rolling practices give each metal the qualities required for a particular high-temperature application.

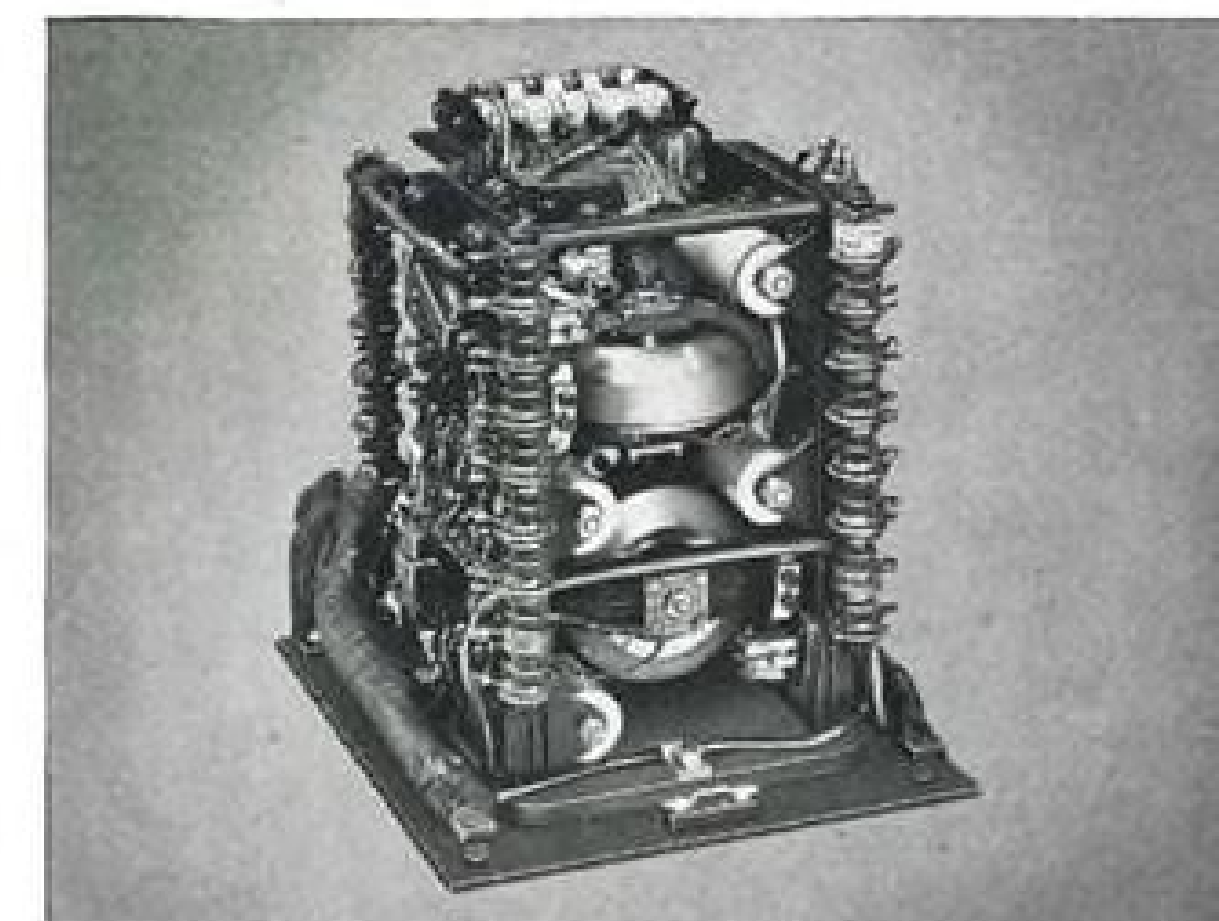
It's a development that paves the way for further advancements in high-temperature jet propulsion and gas turbine engines for aircraft.



The Westinghouse Autopilot. For greater flight safety of tomorrow's planes . . . Westinghouse has developed experimentally a remarkable new flight control system. It utilizes the same gyroscopic principle as the tank gun stabilizer . . . also developed by Westinghouse for 90,000 American tanks.

This new Autopilot can be used either to maintain a fixed course and altitude, or maneuver the plane with a regulated angular velocity in response to finger-tip control. The complete control, of which the Gyro Control Unit (in experimental form at right) is the heart, will weigh between 25 and 50 pounds, depending on the plane to which it is applied.

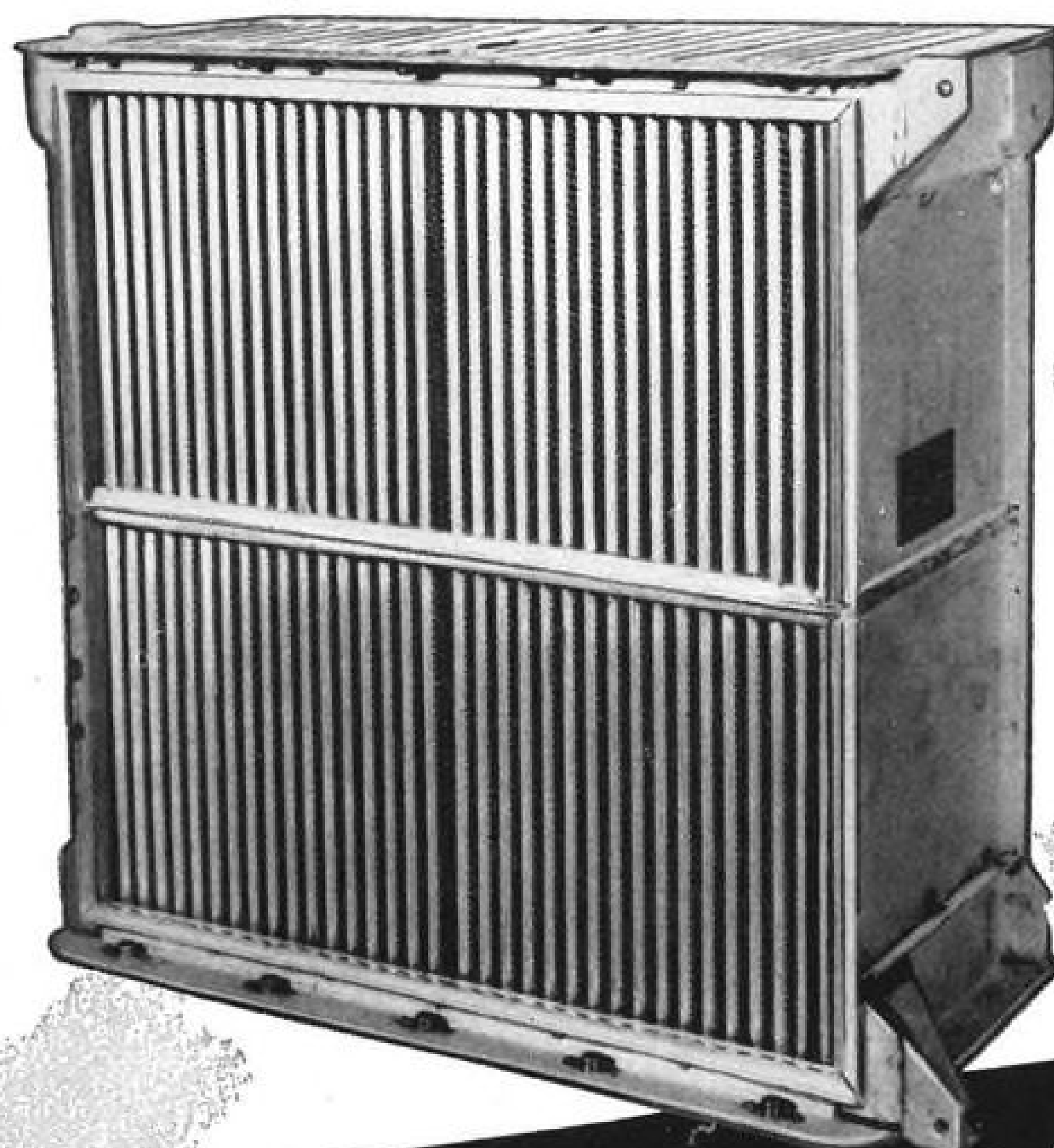
It is not, at present, available commercially.



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FINANCIAL

Airline Problem in RFC's Lap

Analysis points to Congress as basic key to ultimate solution of carriers' financial difficulties.

The financial predicament of the airline industry has led President Truman to direct the Reconstruction Finance Corp. to make a study of the group's finances and to advance recommendations for necessary corrective action.

The RFC is being asked to determine the type of financing best suited to the industry not only for its immediate requirements but also for its long-term development.

► **Credit Standing**—The low credit standing of the airlines and their general inability to obtain needed funds for equipment and other capital expenditures have led to the supposition that a few loans here and there are all that are necessary to cure the ailments of the industry. Presumably, it is this philosophy which motivated the directive setting the special RFC study in operation.

This approach focuses attention on the symptoms rather than the cause. Adequate new capital will be forthcoming to the airlines just as rapidly as earning power or the hope of earning power is restored to the individual airlines. The accomplishment of this objective will require a major overhauling of the airline network and new concepts of operating controls. Such effective revisions would require Congressional sanction and involve a controversial and time-consuming process.

► **APC Study**—Last year, Mr. Truman's own Air Policy Commission made an exhaustive examination of the industry's problems. While some of its final recommendations were most general in nature, it is not believed that even these suggestions received active White House support. The Congressional Aviation Policy Board went over much the same ground, was inclined to be a little more specific and implemented a few long-range proposals of its own in the form of legislation at the last regular session of Congress.

Without first understanding the industry's basic condition and problems, the RFC can hope to accomplish but little in its current study.

► **Predicament**—The airline financing predicament cannot be solved by a seemingly simple device such as the equipment trust proposal. Any program of equipment trust financing must fit

in as part of the general capital structure of the company involved.

At various times, considerable support has been found for a government-owned corporation to buy air transports and lease them to the commercial carriers. The problems of a cash-starved airline will hardly be solved in this manner.

► **Extras**—Spare parts for the equipment fleet are required and generally run about 25 percent and more of the cost of the planes. Further, adequate facilities for communications, maintenance and overhaul operations must be provided. It is essential to maintain competent sales, reservations and administrative services. All these functions require capital over and above that supplied by equipment trust financing whether from a government agency or through private channels.

The airlines, as a group, have a notorious record for operating on particularly low working capital balances. While the industry is virtually on a cash basis with its passenger and cargo services, unforeseen shifts can have devastating effects on finances. For instance, strikes or sudden grounding of equipment can convert into immediate liabilities advance ticket sales which are a part of current assets and provide substantial working balances.

► **Various Forms**—The rapid expansion of airline capital structures immediately following the postwar period has created various forms of indebtedness. Such obligations have appeared in debentures, commercial loans both secured and unsecured and of a short- or long-term nature. When originally conceived, such obligations accounted for as much as 50 percent of capitalization in many instances.

This high debt ratio has proved unsound under adverse operating conditions. Prior to the inclusion of the Hughes-held notes as capital stock, the TWA capitalization "above water" consisted entirely of borrowed funds. In other words, the book value of the equity was completely liquidated by operating deficits.

► **Equipment Purchases**—Most of the debts in the airline industry were incurred to finance equipment purchases. However, such funds were not always

employed for this purpose. Because of the legal objections to equipment trusts, many unsecured term loans were developed.

It was believed that by imposing negative pledge clauses, adequate protection would be afforded the lender. Actually, however, this arrangement has not always worked out as planned. In some cases, money originally intended for plane purchases was diverted to operating purposes. Of greater importance, the borrower lost much flexibility in any future financing proposals.

► **Obstacles Removed**—Nevertheless, the equipment trust device may be expected to figure prominently in providing much needed financing for the airlines. A few of the legal and technical obstacles which have previously retarded the adoption of the equipment trust medium were removed at the last regular session of Congress.

A major hurdle remains in the uncertain status of equipment under any proposed airline trust agreement in the event of bankruptcy. A proper amendment to the Bankruptcy Act was proposed but was found to have extensive involvements. Another attempt appears indicated at the forthcoming session.

► **Pan Am First**—To the limited extent already used, equipment trusts have met with considerable success in the air transport field. Pan American Airways was the first and thus far the only line to resort to true equipment trust financing. This was done in January, 1939.

The principle of trust financing was present when American Airlines, late in 1935, utilized a loan from the RFC to pay for its first fleet of DC-3s, which gave the carrier a jump on the other lines in equipment. The commercial banks refused to advance any funds for this type of transaction, maintaining the industry was too risky. RFC thereupon advanced the money at 5 percent, taking a chattel mortgage on the planes, with American making a 40 percent equity payment and amortizing the loan on a monthly basis.

► **NWA Later**—A few years later, Northwest Airlines obtained a similar loan from the RFC.

Western Air Lines is the only carrier with loans outstanding from the RFC at the present time. In December, 1947, this carrier, by pledging various assets, received a \$3.8 million loan from the RFC at 4 percent interest to refund its previous obligations. Last July, an additional credit of \$2.3 million was made available to facilitate financing a fleet of Convairs. Thus far, only \$600,000 of this additional credit has been drawn down.

► **Prudence**—Before the RFC can advance a loan to a certificated airline, CAB must state that such airline, "on the basis of present and prospective

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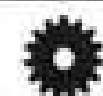
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earnings, may be expected to meet its fixed charges without a reduction thereof through judicial reorganization." This requirement alone virtually assures "prudent" banking judgment on the part of the RFC.

The basic criterion in sound airline financing should be the ability of the carrier to develop sustained earning power. Under such circumstances, an air carrier may be expected to experience little if any difficulty in obtaining the necessary equipment trust financing or such other accommodations as may be required.

With a favorable outlook for earnings, the lender can anticipate the regular amortization of outstanding obligations. Generally, such accommodations, under those conditions, will be readily forthcoming through private channels at favorable terms, thus obviating the need of the RFC to be of any assistance.

For the RFC to make loans to the airlines on any other basis would place such advances in the same category as grants currently being made under the Marshall Plan.—Selig Altschul.

Solar Year Good, Menasco Surplus Up

Solar Aircraft Co., San Diego and Des Moines, has reported net income of \$800,967—largest in the company's history—for the fiscal year ended Apr. 30, 1948. For the year previous, Solar showed a loss of \$509,065.

Earnings per share of common stock were \$1.60, against a deficit per share of \$1.40 in 1947. Sales for the past fiscal year of \$14,472,336 compare with \$11,299,112 for the year ended Apr. 30, 1947, an increase of approximately 28 percent. Company states that its earnings available for reinvestment in the business and for dividends in fiscal 1948 were the largest in its experience.

► **Buys Plant**—Solar, which builds jet components and exhaust systems has purchased for about \$725,000 the plant and equipment at Des Moines previously leased from the Reconstruction Finance Corp. President Edmund T. Price reported that bank loans stood at \$870,000 at the end of the 1948 fiscal year, and had been reduced to \$770,000 by June 23, 1948, date of his report. Amount used to reduce bank loans during the year ended Apr. 30 was \$1,380,000.

In another fiscal year report, Menasco Manufacturing Co., Burbank, Calif., showed net sales for the twelve months ended June 30, 1948, of \$3,973,035. Total increase in earned surplus was \$77,553, including \$14,515 in operations profit and \$63,038 in recovery of tax refunds and other items affecting prior years' operations.

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SALES & SERVICE

Flying Farmers Plan Air Research

Convention discusses organization to study problems of aerial seeding, pest and weed control.

By Alexander McSurely

COLUMBUS—Plans for a national research organization to develop approved techniques for aviation spraying and dusting of farmlands are in formative stage, following the recent meeting here of the National Flying Farmers Association.

Full support from federal aviation and agricultural agencies for the new project was indicated at the meeting by Delos W. Rentzel, CAA administrator, who proposed a preliminary clinic of aviation and agricultural interests to outline the research and facilities needed. Basic fields include aircraft specially designed for agricultural needs, studies of chemicals to be used for dusting and spraying, weed control, etc. Further discussion by directors of the association developed tentative plans to hold such a clinic within the next few months, probably at a large agricultural college in the Midwest.

► **New Officers**—Forrest Watson, Thomas, Okla., was reelected president and Bert Hanson, Vernon Center, Minn., was re-elected treasurer. Charles Rose, of Roseland, Ark., was named vice president. Herb Graham, of Oklahoma A. & M. College, Stillwater, Okla., continues as executive secretary. Rose succeeds Alfred Ward, Akron, Colo., rancher, retiring vice president. ► **New Advances**—Rentzel and other speakers at the Flying Farmers meeting pointed out that advances in seeding and spraying chemicals in the first postwar years merited thorough investigation of large scale scientific techniques and problems resulting from spraying and seeding. State and national regulatory problems resulting from improper use of spraying chemicals, such as the 24D weed killer which has caused damage to other crops when improperly used, are other factors to be considered.

It is believed however that the rapidly growing large scale use of aerial seeding, weed control and pest control will result in a substantial increase in the total national agricultural productivity. Extent of its effectiveness may be determined largely by the background of cooperative effort in the early

years among the farmers, aviation and agricultural manufacturers, and government agencies concerned.

► **Wooster Demonstration**—Nearly 300 Flying Farmer planes from a wide cross section of the United States landed at Don Scott airport for the Columbus meeting held at Ohio State University. Many of the flying farmers flew from Columbus to the university's experiment station at Wooster, Ohio, for a demonstration of activities there, and then continued on to Cleveland for the National Air Races.

Dwane Wallace, president of Cessna Aircraft Co., Wichita, who flew into the meeting in his own Cessna 195 five-place airplane, pointed out to the group that he has flown approximately 33,000 miles on business trips since April, in his own plane, as an example of the useful transportation provided by the family-size aircraft. Pioneering of the Flying Farmer in the use of the plane as a piece of agricultural ma-

chinery is in keeping with his continuing philosophy of using new mechanical equipment as fast as it becomes practical, Wallace told the group.

► **Airlines and Farmers**—Robert Ramspeck, executive vice president of Air Transport Association, discussed problems of scheduled airlines with the farmers, pointing out the continuing obstacle to all forms of air travel inherent in conflicting and overlapping state regulations. He urged the importance of keeping state regulations at a minimum and keeping them uniform to avoid interference with national transportation which crosses state lines from coast to coast in a few hours.

William Anderson, Pennsylvania state aeronautics director, reported that state aviation officials are making a united effort to keep state regulations down to a workable level, and as uniform as possible to prevent interference with interstate air travel. He cited accident investigation and safety programs conducted in his own and other states as a sample of effective regulatory work which states are doing.

Growth of the Flying Farmers organization in the last year serves as an important indication of this consumer groups' future influence in aviation. From 1300 members a year ago, the membership has now grown to 6500 and the growth is continuing. Active membership is limited to persons who make 50 percent or more of their income in agriculture and who have at least a student pilot license. However



PLAQUE AWARDED REP. MILLER

Rep. William J. Miller (R. Conn.), who was active in the recent Congressional fight to preserve GI flight training, received the first annual award of the Connecticut Aviation Trades Association at a luncheon at Groton recently. Shown left

to right are: Maj. Al Williams Gulf Oil Company aviation manager and noted acrobatic pilot, principal speaker; Rep. Miller; Robert Halpin CATA president, presenting the award plaque to Miller; and Rep. Horace Seely-Brown (R. Conn.).

a large percentage of the members own their own planes.

► **Save GI Training**—Weight of the Flying Farmers was thrown into aviation's continuing effort to save a portion of the GI flight training program from the efforts of the Veterans' Administration to eliminate it in many states. The farmers adopted a resolution pointing out that the airplane is becoming increasingly useful as an agricultural and business implement and asking state flying farmer groups to use their influence with Congressional delegations to get establishment of a firm national VA policy which will implement rather than controvert the intention of Congress to enable veterans who wish to use the airplane in their occupations to learn to fly.

President Watson urged that the Flying Farmers establish an advisory committee of representatives of other aviation interests who would form a pool of their respective backgrounds to guide the association, and pointed out that the association as a consumer group not serving any particular interests had a good potential field of service to all aviation in such an activity.

► **Crosswind**—The Flying Farmers spent their opening day at Don Scott airport, watching a series of aviation demonstrations, including Goodyear crosswind landing gear, controlled model planes, air to ground radio communication of the Ohio state highway police between a state police car at the airport and the police Beech Bonanza which was observing traffic conditions from the air; demonstration of a four-blade Sensenich fixed pitch propeller designed for quiet plane operation, a Bell helicopter from Wright Field, and Air Reserve flight demonstrations.

Study of the individual members attending the national meeting indicated that the farmers as a group are still probably the best potential market for family-sized personal aircraft. But many of those attending flew smaller planes. Typical was the attendance of whole farm families, including husband, wife, and children, in some cases all pilots.

In age the group ranged from 83-year-old Starr Nelson, Colorado farmer and Ercoupe pilot, down to a six-weeks old Ohio farm couple's baby daughter, bundled into the family plane and brought along to the convention.

Close Maitland Field

Milwaukee's downtown airstrip, Maitland Field, has been closed until Nov. 1 because of the \$205,000 construction program under way. John A. Henebry, president of Skymotive Milwaukee Inc., operator at the field, said the construction work would cover a large part of the field making flight operations unsafe.

BRIEFING FOR DEALERS & DISTRIBUTORS

AIRCRAFT SHOW—Nearest thing to a representative showing of new 1948 personal aircraft that we have seen this year was the collection of planes on exhibit at Don Scott Field, Ohio State University's airport at Columbus, during the recent Flying Farmers meeting. The show differed from most of its kind, in that the people looking the airplanes over were actual airplane customers. Most of them had come into that airport in their own planes, including quite a few 1948 models.

FOUR-PLACER COMPARISON—Planes on display included virtually every American four-placer now on the market. From the Piper Family Cruiser—lowest priced four-placer—to the big Cessna 195—highest priced plane—they made a graphic demonstration of the increasing recognition that the farm plane market is giving to family-sized aircraft which can be used equally well to carry cargo. The new Piper, an Aeronca Sedan, and a complete line of Cessna planes, were brought to the field by dealers and manufacturers. But most of the approximately 300 airplanes were flown in by the farmers themselves.

GRADUATION PROCESS—A process of graduating from the low powered two-placers to larger and more powerful planes seems to be taking place with many of the farmers. We talked to Al Ward, a Colorado rancher, who now has a Cessna 195 (5-placer) and also a Cessna 170 (4-placer). He finds plenty of use for both of them. He recently traded in his Cessna 140 two-placer to buy the 170. Forrest Watson, the Flying Farmers national president, has graduated from the Aeronca he used to fly to a higher powered Swift 125, and so it goes.

ERCOUPE TESTIMONIAL—Presence of 83-year-old Starr Nelson at the Columbus gathering was in itself a remarkable testimonial to the Ercoupe. The oldest flying farmer has been flying an Ercoupe for years, and flew from his Colorado home to Columbus in his own plane. The last we heard he was dickering with Joe Redding, domestic sales manager for Sanders Aviation (world Ercoupe distributor) to trade in his older model and acquire the new 1948 airplane, No. 5000 of which Joe had brought to the meeting. Nelson says it takes him an hour and a half to get up to the altitude of the mountains surrounding his home. He has to go to about 14,000 ft. to get over them. "But after that," he adds, "It's a toboggan slide to any place in the United States I want to go." The oldtimer piloted locomotives through the Rockies for many years until he was retired, and then took up piloting the Ercoupe instead. Even before he went to railroading he had done piloting of another sort, on the old Chisholm trail, herding cattle up to Dodge City.

CROSSWIND GEAR INTEREST—The flying farmers with their single direction landing strips are natural customers for the new fangled crosswind landing gears, and they showed keen interest in demonstrations of the swivelling gears at Columbus. Art Chapman, Goodyear demonstration pilot, told us that Cessna's first order for 100 sets of the Goodyear crosswind wheels was already spoken for by customers who want it as optional extra cost on their Cessnas.

FOUR-BLADER DEMONSTRATION—A flight demonstration of a four-blade fixed-pitch Sensenich propeller on a Cessna 140 emphasized the quietness of this type of propeller, in probably the first test of its kind before a group of potential consumers. The demonstrator had only normal mufflers, and the engine turned at normal cruising rpm. Yet even so, the noise level was down appreciably below that of other planes. A sacrifice in rate of climb in the four-blader is something which would be hard for most farm flyers to take, but the advantage of quietness at least partially offsets this disadvantage.

ERCOUPE CROSS COUNTRY—A flight from Washington, D. C., to Columbus, in the 5000th Ercoupe, with Joe Redding as pilot, gave to the writer another realization of how pleasant such small plane cross-country flying can be under ideal conditions. The flight was made in somewhat less than four hours elapsed time with a 20 minute stop at Connelville, Pa., included. The airplane trimmed out nicely and Redding actually flew "no hands" a good part of the way.

—ALEXANDER McSURELY

Performance talks

"... have proven themselves in all sorts of weather in western states and Canada." ... Western.

"... actually require less maintenance coast-to-coast, border-to-border and to Hawaii." ... United.

"... We have been able to reduce maintenance costs with these starters." ... American Overseas.

"... among the most reliable pieces of equipment on our air freighters." ... Slick.

"... are giving reliable and economical performance on our Constellation Fleet." ... TWA.

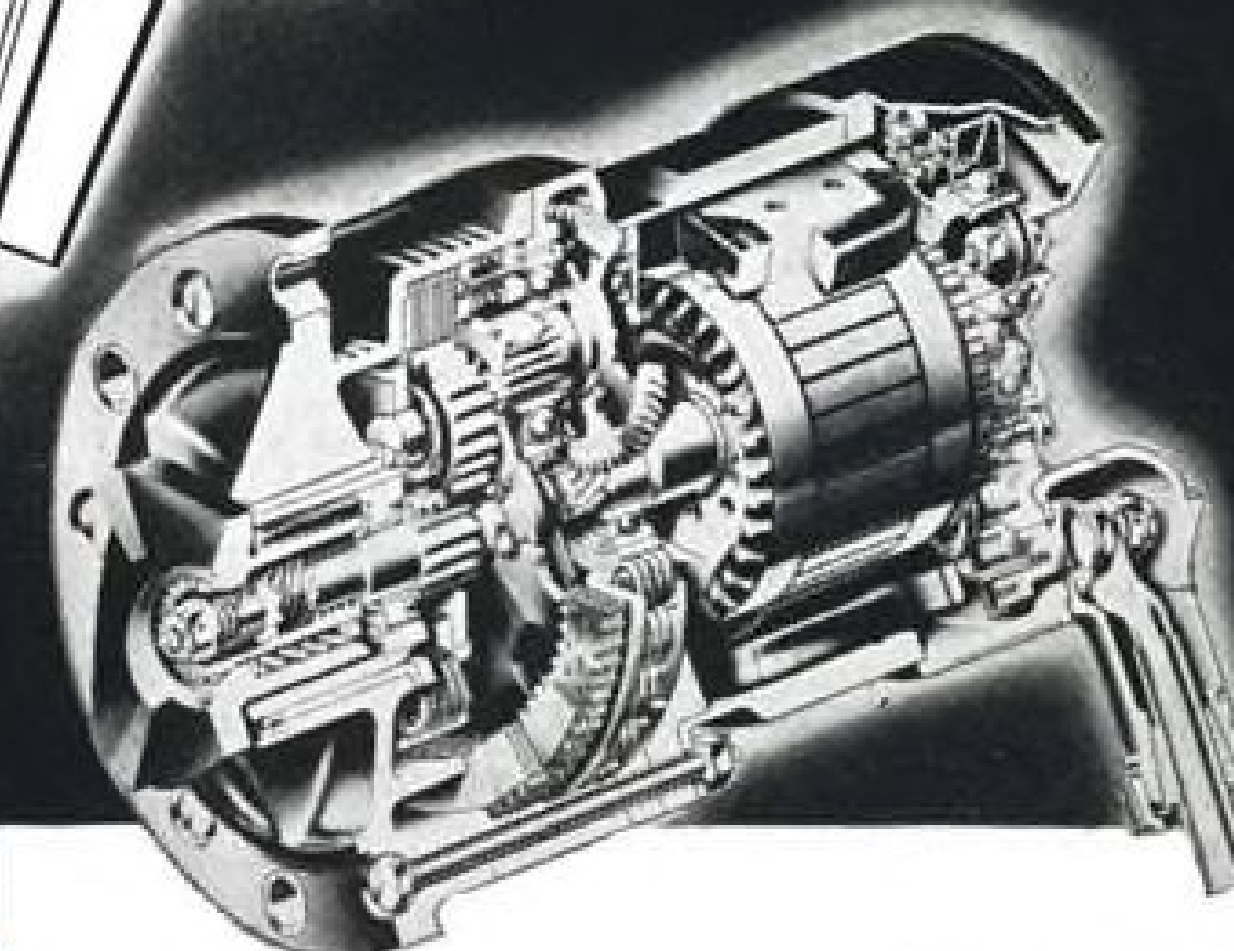
"... have cut overhaul time in half and reduced off-schedule maintenance." ... Northwest.

"... their durability and simplicity of design mean less parts replacement and less man-hours to overhaul." ... National.

"... from both operational and maintenance viewpoints their service has been very satisfactory." ... Colonial.

"... Jack & Heintz Starters have given excellent service with minimum maintenance." ... Delta.

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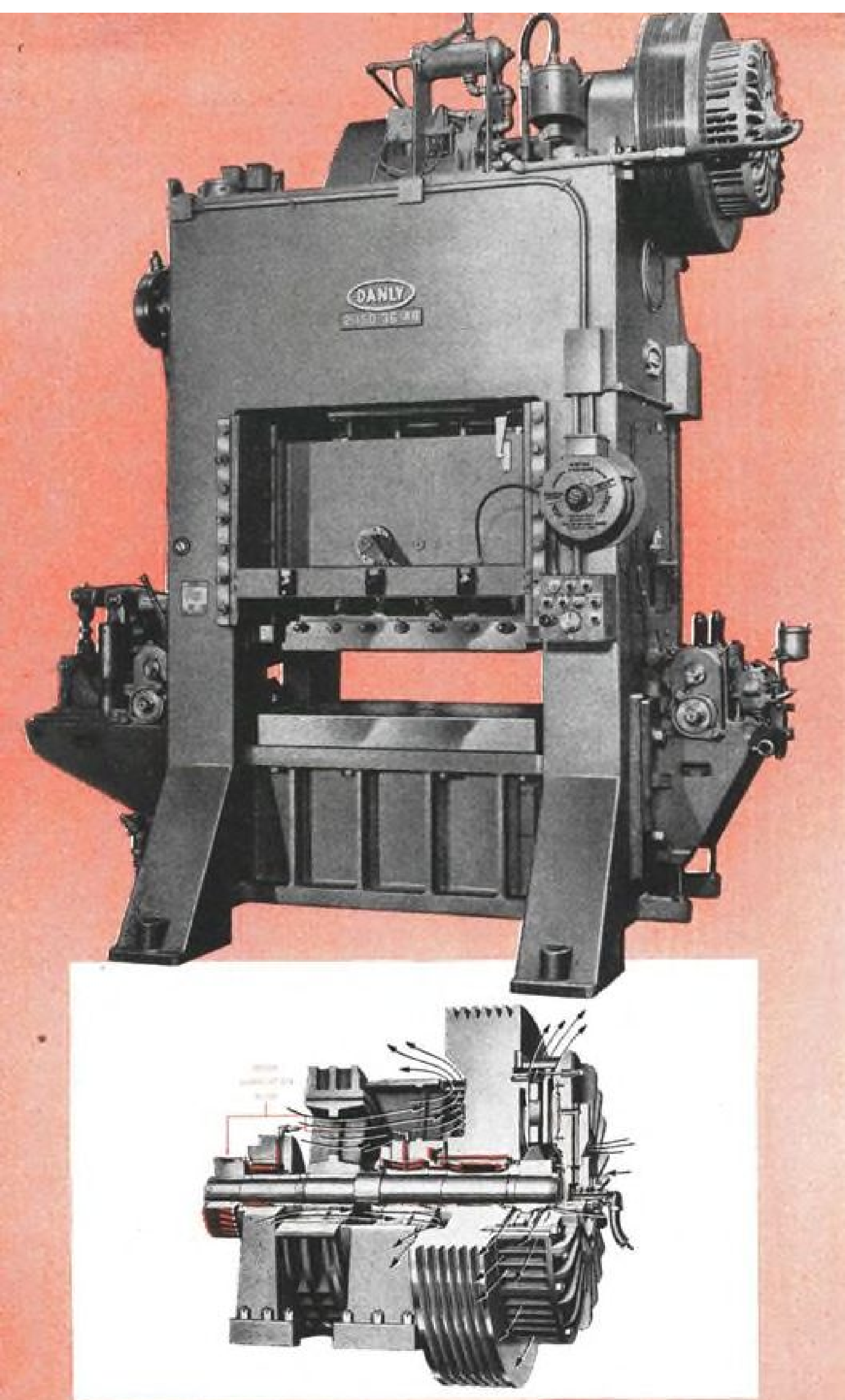


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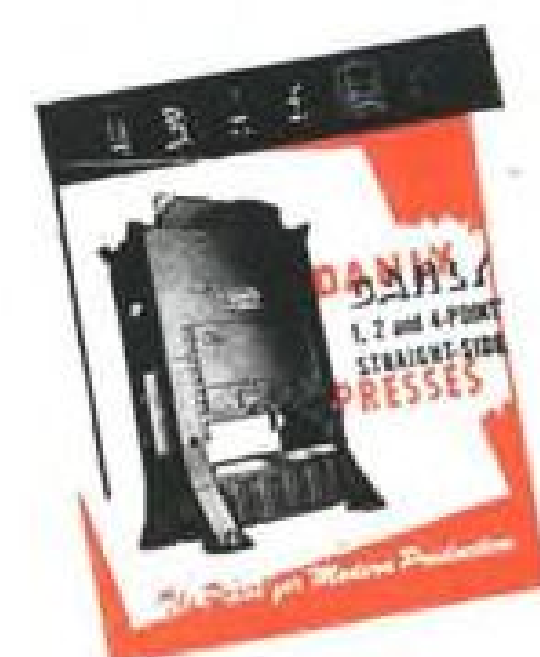
In addition, solid friction discs are used which have a greater wearing surface than riveted linings. In tested operation under load, more than 8,000,000 successive clutch engagements failed to make replacement of the original discs necessary.

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Further, the clutch housing is designed to provide high velocity ventilation, which together with the automatic built-in lubricating system providing filtered oil to all drive shaft members, insures long trouble-free service less downtime and more production at lower costs.

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AIR TRANSPORT

Airlines Backstop Berlin Airlift

Nonsked contribution heaviest thus far as carriers fly priority supplies and personnel to Germany.

The U. S. air transport industry, which has been given a vital role in bolstering American military supply lines to Europe, is preparing to go all-out should a more critical emergency arise.

Both certificated and uncertificated lines during most of the summer have participated in the trans-Atlantic lift of high-priority cargo and personnel. The commercial carriers' first job—taken over soon after the Berlin blockade was imposed—involved transportation of spare parts from Westover Field, Mass., to Frankfurt, Germany, for use in C-54s employed in "Operation Vittles."

► **Lift Expands** — This movement has continued and expanded. More recently the airlines have helped supply the three B-29 groups based in England and have facilitated transportation back to the U. S. of military dependents and civilian personnel stationed in the American zone of Germany.

Meanwhile, the committee appointed last March by the Air Transport Association to study plans for utilizing the certificated airlines in case of national emergency has had several meetings. A plan for continued operation of the regular carriers during a crisis, together with proposed allocation of aircraft, was submitted to the commander of the Military Air Transport Service for approval last month.

The final setup has not yet been decided. When it is, ATA's legal subcommittee will work with MATS to develop implementing contracts.

► **All Facilities Offered**—Several uncertificated carriers have offered their entire facilities to the military. To date, the contribution of the more flexible nonscheduled and contract companies in the European supply line has overshadowed that of the certificated operators.

In the first movement of 62 tons of military materiel into Frankfurt last July, irregular carriers made six flights against three for the regular U. S. flag lines certificated over the North Atlantic. In the second lift, involving 100 tons of engines, the uncertificated companies made 14 flights against two for the flag lines.

Three irregular carriers—Seaboard & Western Airlines, Alaska Airlines and

Transocean Air Lines—had the necessary long-range cargoplanes available when MATS found itself unable to handle its suddenly-increased burden. American Overseas Airlines, TWA and Pan American Airways had a lesser amount of long range freight capacity immediately at hand.

► **Tonnage Given** — During the first three weeks of July, Seaboard & Western's C-54s made ten flights from Westover Field to Frankfurt carrying 144,192 lb. of cargo—an average of 14,419 lb. per flight. In the same period, the certificated airlines' five flights accounted for 64,459 lb., or 12,891 lb. per flight.

Through Sept. 6, Seaboard and



LANDING AIDS CHIEF

With renewal of its contract to operate the Landing Aids Experiment Station at Arcata, Calif., Transocean Air Lines recently named Dr. Maurice A. Garbell (above) as technical director of the project. Dr. Garbell has conducted extensive research with sailplanes, both as a designer and meteorologist; and during several years' association as technical instructor with major U. S. airlines he made studies of upper air turbulence. Transocean has been contract operator of the Air Force-Navy-CAA-Air Transport Association project at Arcata since January, 1947. In addition to managing the facility, Transocean's contract services include installation and flight testing of the landing aids.

Western had flown 411,554 lb. from the U. S. to Frankfurt and 292,038 lb. from Germany back to the U. S. Between military cargo flights, S&W assisted in the Frankfurt-Berlin shuttle, carrying 743,827 lb. Inbound shipments to Berlin consisted of foodstuffs, while outbound loads were made up of manufactured or partly-manufactured items for the American zone of Germany.

Altogether, the three principal irregular carriers participating in the MATS auxiliary have about 15 C-54s in the Atlantic area. While not engaged in the military lift their activities have been extremely varied.

► **Other Activity**—Seaboard & Western's five C-54s are engaged in commercial cargo service to Europe on an irregular basis. But they have also made a number of special trips for government agencies.

Transocean Air Lines, which operates from seven to eight C-54s in the Atlantic area, also is figuring prominently in the MATS auxiliary. Besides flying between the U. S. and Frankfurt with materiel to implement Operation Vittles, TAL has made several trips into Berlin with GCA equipment and other supplies.

A major TAL operation is the carrying out of its three-year contract with the International Refugee Organization to fly around 25,000 displaced persons to Venezuela. Flights are made via Gander, Newfoundland, and Bradley Field, Windsor Locks, Conn.

► **Flights to Australia**—Transocean recently began flights to Australia for the Hebrew Immigration Aid Society and has done considerable work for the United Nations and State Department. In the Pacific, TAL has been carrying fishermen between Seattle and canneries in Alaska and has been flying from Oakland, Calif., to Guam and Okinawa for the Corps of Engineers.

Alaska Airlines, which is certificated in Alaska, has had about four C-54s in the Atlantic area. Besides its military work, it has been active on the Seattle-Alaska run on a non-scheduled basis and has made flights to all parts of the world under contract.

► **Berlin Supply Link**—American Overseas Airlines during August flew 3100 civilians and almost 2,000,000 lb. of freight between blockaded Berlin and Frankfurt. These operations were in addition to special cargo flights made between the U. S. and Frankfurt and regularly-scheduled westbound passenger trips from Germany carrying soldiers' dependents and civilian personnel who had completed tours of duty in the American zone of Germany.

The only American flag carrier operating into Berlin on a regular schedule, AOA made 192 flights over the Frankfurt-Berlin air corridor in August. Cargo carried on the run by American

Overseas last month aggregated 1,960,000 lb. against 375,000 lb. in July, and mail accounted for another 150,000 lb. Besides passengers and food, AOA's 25 roundtrip flights each week between Frankfurt and Berlin carry medical supplies and industrial equipment.

► **Chartered British Planes** — British commercial airlines also have entered the emergency airlift picture. The charter section of British European Airways recently obtained 15 planes from nine British contract operators. Aircraft included two Hythe flying boats, a Liberator, a Halifax and 11 C-47s. During its first week of operations in Germany, the British civil airlift flew more than 500 tons of coal and 620,000 lb. of provisions into Berlin.

Domestically, the all-cargo lines have aided in their end of the MATS auxiliary operation. Slick and the Flying Tiger Line have both hauled materiel to east coast Air Force bases where it is transferred to the trans-Atlantic carriers.

► **U. S. Bases Served**—Slick has been requested by the Air Force Materiel Command to transport military airfreight between nine bases. They are Westover, Chicopee Falls, Mass.; Olmstead, Middletown, Pa.; Wright-Patterson, Dayton, O.; Tinker, Oklahoma City, Okla.; Kelly, San Antonio, Tex.; Fairfield-Suisun, Fairfield, Calif.; March, Riverside, Calif.; McClellan, Sacramento, Calif., and Hill, Ogden, Utah.

The move was made by the Air Materiel Command because aircraft and personnel formerly assigned to MATS' domestic operations have been diverted to the European theater. Other cargo carriers may also seek authorization to operate into these nine bases.

► **Work to Continue**—Lifting of the Russian blockade of Berlin will not mean the end of the commercial airlines' domestic or trans-Atlantic lift for the Military Air Transport Service. MATS equipment has taken a heavy beating as it pushed up its tonnage figures in Operation Vittles.

The acting chief of the Air Force's transportation division says it has become apparent that in many cases the rates of commercial airlines are competitive with existing forms of premium surface transportation. "As a consequence," he declared, "there exists a continuing traffic potential in this field after the operations of the Military Air Transport Service have been restored to their normal level."

Despite this assurance, uncertificated operators on the trans-Atlantic run are wondering if they will not be shut out of future military business to a large extent, even though the Air Force has been extremely pleased with their work. Reason for this apprehension is the so-called Symington policy.

► **Symington Policy**—The policy was formulated early this year when the Air Force was seeking air transportation for Army dependents bound from the West Coast to Tokyo and other points in the Orient. At that time, the Air Transport Association urged the government to employ only certificated airlines for needed government travel "in every instance where the certificated airlines are adequate to perform the service."

Secretary of the Air Force W. Stuart Symington decided the issue by offering the certificated carriers on the Orient route—Northwest Airlines and Pan American Airways—as many passengers as they could handle on their regularly-scheduled flights without adding extra sections. Contract operators were utilized for the remainder of the traffic.

One of the reasons the certificated trans-Atlantic operators have not participated more importantly in the military airlift to date is that it caught them

in the middle of their busy summer season. Fall will bring a decline in commercial activity on American flag routes, with a resulting increase in unused space, especially for passengers.

► **One-Way Payload**—The military cargo backhaul from Germany to the U. S. may slack off, but it will be necessary to maintain the eastbound lift. If the certificated carriers absorb all the westbound traffic in soldiers' dependents and civilian personnel, the independents will be left with frequent one-way payloads and may have to raise their rates.

Irregular lines are also having their troubles with CAB regulations, which bar them completely from overseas common carriage of persons and limit their cargo operations to irregular or strictly contract flights. Seaboard & Western, Transocean and Alaska Airlines all are currently involved in difficulties with CAB over the scope and regularity of their services.



NEW BRITISH FEEDERLINER

The Percival Prince, Great Britain's newest short-haul transport, is now being demonstrated to feederlines, charter operators and business concerns seeking a suitable replacement for eight- to ten-seat prewar aircraft. Aided by experience gained in building and flying the similar but smaller Merganser, construction of the prototype Prince was completed in little over a year. A high-wing, all-metal monoplane, the Prince has seats for eight passengers, each of whom has a large window. By removing the toilet, two more

passengers can be accommodated. The craft has two 520-hp. Alvis Leonides engines. With eight passengers, two crew and 400 lb. of luggage, its range is 800 miles. The interior can be adapted quickly to carry 2000 lb. of cargo; tie-down fittings are built in. Other contemplated versions of the Prince include a six-passenger executive model, a specially designed model for survey companies, a pest control aircraft, an ambulance and a military trainer. Plane may be fitted with float or ski undercarriages.



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Frank O. Sherrill (left above)
President, S & W Cafeterias

"IN THE AIR CORPS I learned the value of Esso Aviation Products, so when I organized American Air Services it was only natural that I chose to identify my business with the popular Esso Wings."

Ed Winslow (right above)
President, American Air Service, Inc.
Douglas Airport, Charlotte, N. C.

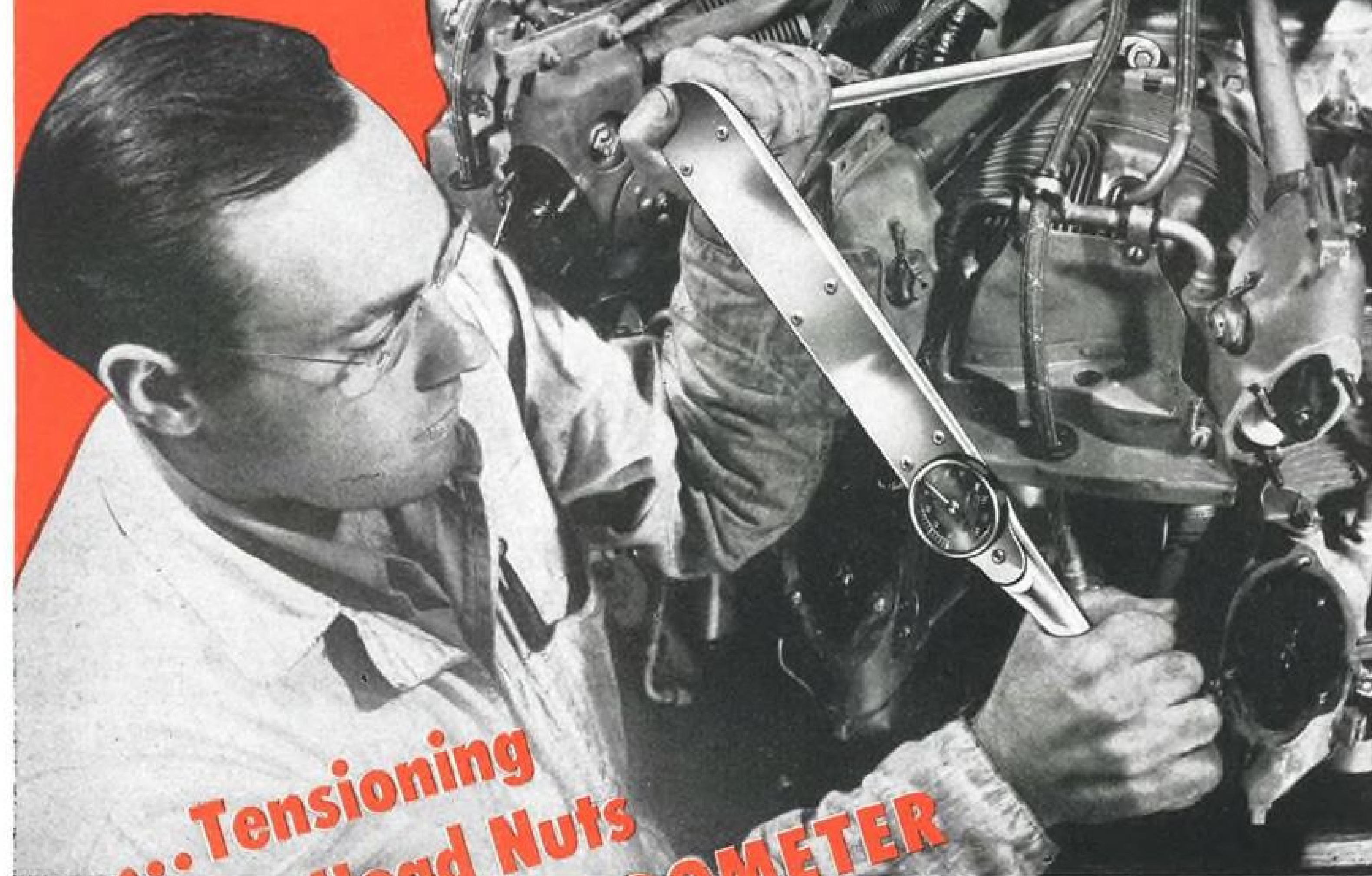


Interior of the S & W Cafeterias' private DC-3.



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Freight Route Fight Enters Last Rounds

One of the final rounds in the long fight by all-cargo carriers for certification took place last week when the Civil Aeronautics Board heard oral argument in the Air Freight Route Case.

Six of the applicants in the proceeding were recommended for three-year certificates by CAB examiners last March. They are Slick Airways, California Eastern Airways, the Flying Tiger Line, U. S. Airlines, Willis Air Service and Airnews, Inc. Eleven domestic trunklines and the Air Transport Association are battling the establishment of certificated all-cargo operations.

► **Recession Seen**—ATA, in a new brief to CAB, asked the Board to consider whether there is not already too much competition in the industry. It declared that the critical financial condition of presently-certificated lines and the prospect of a recession in general business activity in the not-too-distant future make certification of all-cargo routes a "colossal gamble."

The Association pointed out that the six all-cargo lines recommended for certificates by the examiners had piled up more than \$5,000,000 in deficits through last Mar. 31. It noted that financial difficulties had forced some of the all-cargo applicants to curtail or suspend operations entirely although they have had scheduled common carrier privileges for more than a year under special exemption.

► **Reply Issued**—Slick Airways, largest of the all-cargo carriers, replied in its brief to CAB that the certificated passenger lines have consistently taken a negative approach to freight development. Slick charged that the certificated carriers, with the aid of government subsidies, have concentrated their efforts to inflict heavy losses on freight operators and drive them out of business.

The Slick brief emphasized that the first freight tariff filled by a passenger carrier did not become effective until October, 1944. It pointed out that uncertificated operators have handled the bulk of all air freight during most of the postwar period.

► **Air Cargo, Inc., Ruling**—Meanwhile, CAB has reaffirmed its ruling that Air Cargo, Inc., the regular airlines' ground service organization, must admit to membership any holder of a certificate of public convenience and necessity. Eastern Air Lines and United Air Lines had argued that this condition discriminates against the original and present owners of Air Cargo, Inc., who have spent considerable time and money in developing its operations.

The Board replied that any such in-

dustry-wide setups as Air Cargo, Inc., must admit all comers holding a certificate or the public interest will be affected and the development of consolidated activities retarded. Thus, if all-cargo carriers are certificated, they may obtain membership in Air Cargo, Inc., as a matter of right.

Crash Report

CAB report blames EAL crackup on failure to maintain safe altitude.

The crew's failure to follow prescribed instrument procedure and to maintain a safe altitude during an instrument approach to Washington National Airport probably caused the crash of an Eastern Air Lines DC-3 near Oxon Hill, Md., last Jan. 13, according to a Civil Aeronautics Board accident report.

Bound from Atlanta to Washington, the plane struck tree tops about 5.2 miles south of the field while in level flight and in line with a runway and ILS localizer. Five of the nine occupants, including the pilot and co-pilot, were killed. Four were injured.

► **Poor Weather**—Weather conditions around Washington at the time of the

accident were poor, ceilings ranging from 100 to 2000 ft. Visibility was restricted to four miles and there was light rain and fog.

CAB found no evidence of structural failure or mechanical malfunctioning on the DC-3 prior to the mishap. The altimeters apparently were in normal working order, and there was little possibility for wing icing. When the plane hit the trees, landing gear was down and flaps were up.

► **Plane Below Minimum**—Prescribed Eastern Air Lines procedure for an ILS approach to Washington National requires a flight to maintain a minimum altitude of 1500 ft. until over the outer marker on the localizer path 5.2 miles south of the airport. When the plane hit the trees, it was only 106 ft. above sea level instead of the prescribed minimum of 1500 ft.

The accident investigators indicated that the plane must have been below the 1500-ft. minimum for some time before the mishap. Washington National's radar scopes were unable to pick up the DC-3 prior to the crash, although it approached within 5½ miles of the field. Had the craft been flying at the prescribed 1500-ft. minimum, it almost certainly would have been discernible by radar when it passed over Mt. Vernon, which is located nine miles away.




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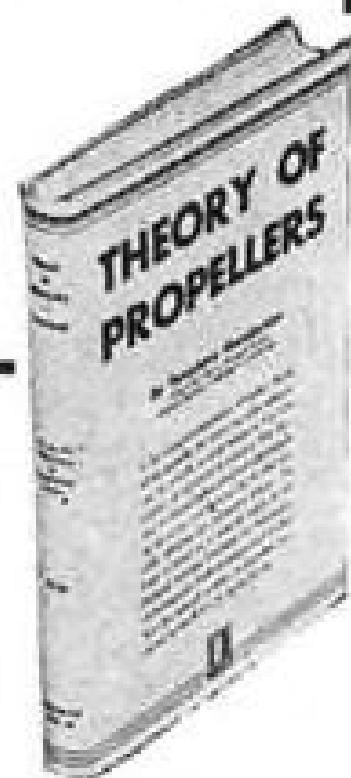
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THEORY OF PROPELLERS

by THEODORE THEODORESEN, Ph. D.
Vice President, the Institute of Technical Aero-
nautics; Formerly, Chief, Division of Physics,
N. A. C. A.

164 pages—6x9—44 figures—18 charts
\$3.50

This authoritative handbook evolves a theory of propellers based on up-to-date facts, figures and statistics. It describes conditions for obtaining optimum loading, particularly the efficiency of the last differential element of loading . . . it reviews the Goldstein boundary problem for single-rotation propellers adapted for heavy loading. Most of the new expressions for the ideal thrust, torque, and efficiency are included, all based on wake parameters. A brief description is given of methods and apparatus for obtaining the circulation, functions $K(x)$ and the mass coefficient $M(x)$.

INCLUDES APPLICATIONS TO DESIGN PROBLEMS

Using a heavily loaded, four-bladed propeller as an example, this book shows the application of the theory to modern design problems. It outlines step-by-step procedures and techniques . . . describe the problem of the slipstream contraction . . . and gives a simple formula for technical use. Varied selection problems are discussed from the designer's viewpoint.

9 BIG CHAPTERS

- Optimum Distribution of Circulation Along Propeller Blade.
- Solution of Optimum Distribution Problem.
- The Propeller Mass Coefficient . . . Exact Thrust, Torque and Efficiency Formulas . . . the Loss Factor.
- Electrical Method for Measuring the Loading Function $k(x)$ and the Mass Coefficient.
- Design Relations and Procedure for Single and Dual Propellers.
- Slipstream Contraction
- Propeller Selection Problems
- Body Interference Problems.
- Elements of Fluid Dynamics as Related to the Propeller Theory.
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on 87% of all foreign
lines outside Russia.

American-built aircraft have achieved
unchallenged supremacy on the world's
airways during the postwar period.

By last April, foreign carriers were
flying 71 percent of their scheduled
plane miles with planes manufactured
in the U. S. Only 18 percent of the
foreign operations were conducted with
non-U. S. equipment, while 11 percent
of the services could not be analyzed
specifically by CAB's Economic Bu-
reau, which made the study.

With all U. S. airlines using planes
of domestic manufacture, the propor-
tion of world air carrier operations out-
side of Russia conducted with Amer-
ican planes reached 87 percent last
spring. Non-U. S. aircraft are used for
about 8 percent of all services, and the
remaining 5 percent could not be clas-
sified.

► **Services Increase** — Aided by their
American-built planes, foreign operators
are accounting for a steadily increasing
portion of total miles flown each week
by all air carriers. Of 8,945,000 sched-
uled plane miles flown weekly in

March, 1946, foreign lines outside of
Russia flew 3,037,000, or 34 percent;
certificated U. S. international lines
961,000, or 11 percent, and certificated
U. S. domestic lines 4,947,000, or 55
percent.

The U. S. share of world-wide serv-
ices decreased from 66 percent early
in 1946 to 61 percent in April, 1947,
and 56 percent in April, 1948. The
trend can be accounted for almost en-
tirely by the leveling off of U. S. domes-
tic operations.

From 4,947,000 scheduled plane
miles weekly in March, 1946, U. S.
domestic carriers increased services to
6,135,000 plane miles weekly in April,
1947, but slid back to 6,089,000 in
April, 1948. By contrast, U. S. inter-
national operators expanded from 961,-
000 scheduled plane miles weekly in
March, 1946, to 1,472,000 in April,
1947, and 1,750,000 in April, 1948.
Meanwhile, foreign services more than
doubled in the two-year period, rising
from 3,037,000 scheduled plane miles
weekly in March, 1946, to 4,817,000
in April, 1947, and 6,199,000 in April,
1948.

► **Route Mileage Expands** — Undupli-
cated route miles flown by the world's
airlines jumped from 471,000 in March,
1946, to 701,000 in April, 1947, and
947,000 in April, 1948. During this
period, certificated U. S. domestic route
mileage rose from 49,000 to 64,000;
U. S. international mileage from 45,000
to 95,000; and foreign mileage from
377,000 to 788,000.

CAB reported the existence of 226
scheduled common carrier airlines in
April, 1948, against 187 a year before
and 163 in the spring of 1946. Of this
year's total, 177 are foreign carriers,
and 49 are U. S. certificated airlines,
including 15 Alaskan operators.

► **Largest Carriers Listed** — The world's
ten largest airlines from the standpoint
of scheduled plane miles flown per
week in April, 1948, were: TWA 1,-
208,580, Pan American Airways 1,105,-
873, United Air Lines 1,067,618,
Eastern Air Lines 1,023,847, American
Airlines 972,641, British Overseas Air-
ways Corp. 514,096, KLM 393,768,
Air France 370,989, Northwest Air-
lines 369,139, and Capital Airlines
300,871.

First six carriers on the basis of un-
duplicated route miles were: Air France
65,299, KLM 54,970, BOAC 54,448,
Pan American 52,855, Sabena 27,873,
and Panair do Brasil 26,020.

Landis Passes Bar

James M. Landis, former chairman
of the Civil Aeronautics Board and one-
time dean of the Harvard Law School,
has taken and passed his first bar ex-
amination.

On-Time Pays

Airlines step up efforts
to fly on schedule. Re-
sult: goodwill.

The airlines are proving their thesis
that clock-watching and passenger good-
will go hand-in-hand.

During the past year, on-time per-
formance has been emphasized by man-
agement to an unprecedented degree.
Results in many cases have been spec-
tacular, with most of the remaining
delays now attributable to factors be-
yond the carriers' control—such as
weather and air traffic conditions.

► **NWA Refund Discontinued** — North-
west Airlines, the only carrier which
has made refunds to passengers be-
cause of delays, dropped the practice
early this month but is continuing its
drive for increased schedule dependabil-
ity. The carrier on Mar. 15 began mak-
ing 5 percent fare refunds to passengers
arriving at their destinations more than
30 minutes late. Less than 10 percent
of NWA's flights were delayed more
than half an hour during the 5½-month
period the refund plan was effective.

TWA recently attained such suc-
cess with its on-time contest among
domestic stations that it has started
similar competition on its overseas
routes. During July, TWA's domestic
flights completed 99.4 percent of their
scheduled mileage, and the carrier's
four-engine planes (Stratoliners and
Constellations) averaged only 9.4 min-
utes late at final destinations. This
represents a 56 percent improvement
over June and an 81 percent gain over
August, 1947.

Constellation flights alone averaged
a flat nine minutes late at final des-
tinations during July. DC-3 passenger
flights averaged 20 minutes late during
the month, a 36 percent improvement
over June and a 47 percent improve-
ment over August, 1947.

► **All Delays Counted** — TWA's compu-
tation of on-time figures counted every
delay of more than one minute, regard-
less of cause. On some of the carrier's
short-haul DC-3 flights, as many as
16 stops are made en route, with al-
lotted ground time for loading and
unloading passengers, mail, cargo and
baggage.

United Air Lines reports that be-
tween March and July it showed a 28
percent gain in the percentage of trips
terminating within 15 minutes of the
scheduled time. In July, UAL operated
almost 98 percent of its scheduled trips
from point of origin; almost 94 percent
departed within 15 minutes of sched-
uled time; over 98 percent were op-
erated through to their terminal points;

and over 72 percent arrived at terminal
points within 15 minutes of scheduled
time.

Braniff Airways' executive vice presi-
dent, Charles E. Beard, states that his
company's flight delays have been re-
duced 75 percent since last November,
when all divisions of the line were
marshalled to tackle the problem of
schedule dependability. Ninety percent
of Braniff's trips now leave within 10
minutes of the scheduled departure
time.

► **Permanent Committee Created** —
Streamlining of terminal operations,
both in ticketing of passengers and in
servicing of planes; purchase of spe-
cialized equipment; and addition and
reallocation of personnel are the prin-
cipal methods by which Braniff has im-
proved on-time performance. The car-
rier has established a permanent
on-time committee whose function is to
track down every controllable delay on
both domestic and international flights
and take steps to prevent a recurrence
by changing operations procedures,
purchasing new equipment, or hiring
or firing personnel.

Continental Air Lines' program to
step up ground handling efficiency re-
sulted in a 46.9 percent reduction in
flight delays during the first seven
months of 1948 compared to the same
period last year. Between Apr. 1 and
July 31, Continental completed 100
percent of its scheduled mileage.

Tucson Field Readied For Airline Traffic

Tucson Municipal Airport, former
government base six miles south of the
city of Tucson, Ariz., will be opened to
commercial traffic Oct. 15.

R. W. F. Schmidt has resigned his
position as superintendent of airports
for the Civil Aeronautics Administra-
tion, Region Six, to become manager
of the Tucson field.

The newly created municipal field has
been leased from the government for
25 years with a renewal option of 25
years. It has two 6300-ft. runways, one
6000-ft., administration buildings, and
three huge hangars, each 720 ft. in
length with a span of 160 ft.

► **AA to Move In** — American Airlines,
only carrier now landing at Tucson, will
move operations to the new field upon
its opening. Braniff, Eastern, and Aereo
Naves want to lease space if CAB ap-
proves applications to enter Tucson.

Unique aspect of the new municipal
field is that it was made possible by the
banding together of 15 Tucson business-
men as "Tucson Airport Authority."
The authority is empowered to meet air-
port operating costs on a 4 percent
debenture basis. Business forecasts in-
dicate that initial crediting arrange-
ments will be required no longer than
through 1949, and that by the spring
of 1950 the airport will be paying its
way.



FLIGHT SIMULATOR PREVIEWED

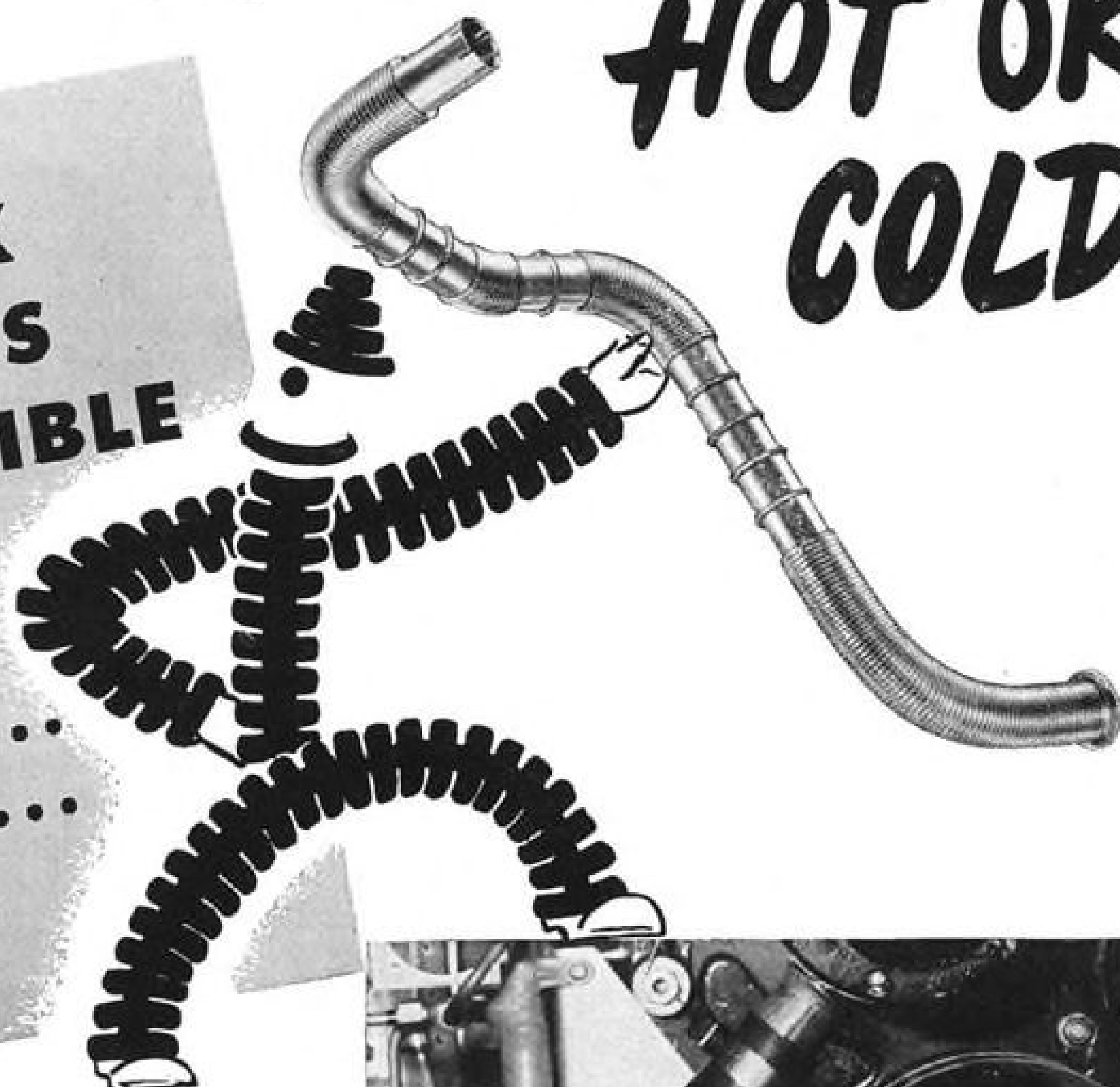
Pan American Airways took delivery this
month of the Dehmel electronic flight
simulator it will use to train crews for
Stratocruiser duty. Previewing the device
are Brig. Gen. Carl Brandt, military require-

ments chief for the Air Force; Rear Adm.
John Cassidy, assistant deputy chief of naval
operations for air, and John R. Alison, as-
sistant secretary of commerce for air. The
simulator is built by Curtiss-Wright.

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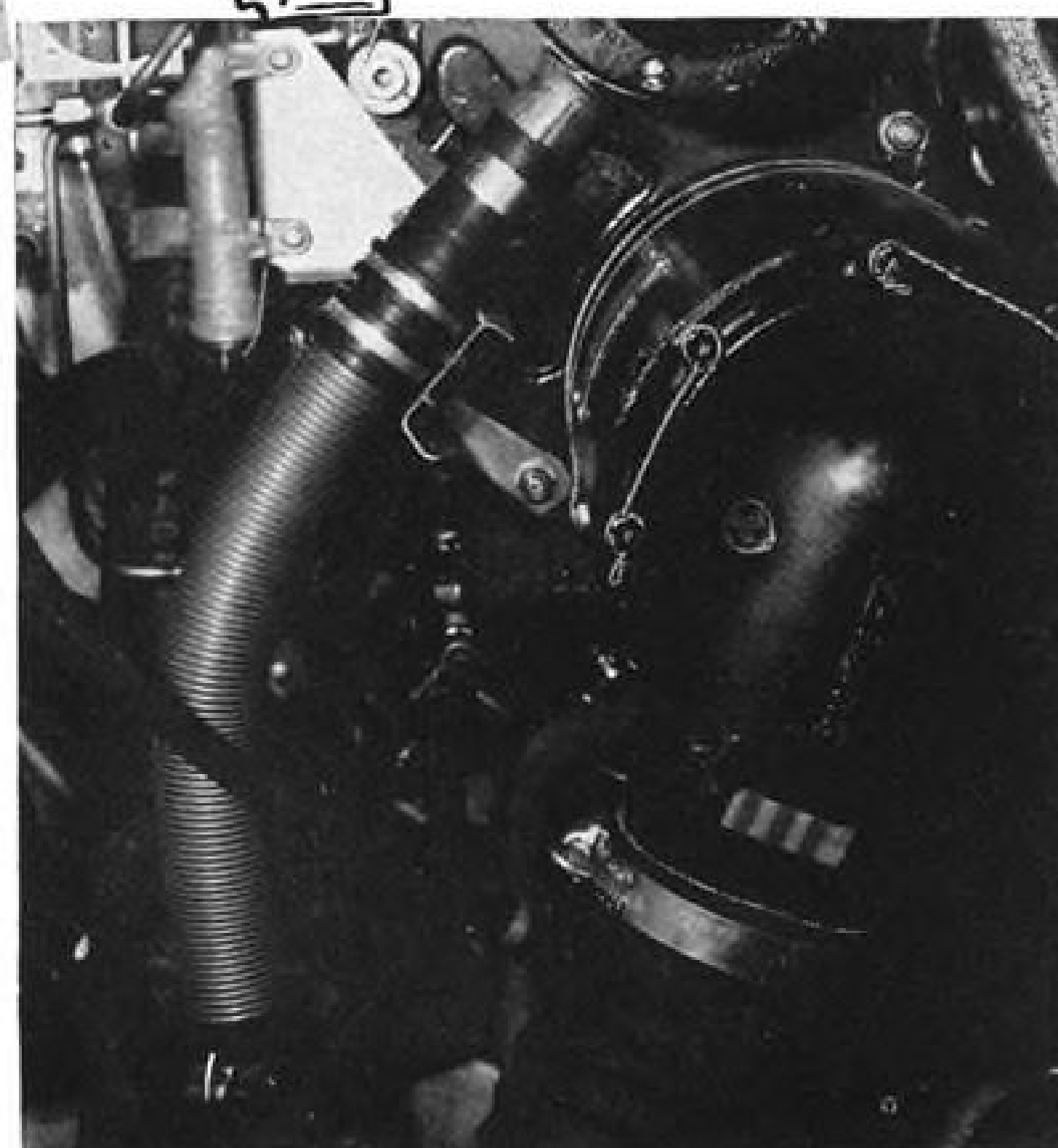


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Maywood, Illinois
Plants at Maywood, Elgin and Rock Falls, Illinois
In Canada: Canadian Metal Hose Company, Limited, Brampton, Ontario



Comparative Transportation Safety Record

Passenger Fatalities and Rate of Passenger Fatalities per 100,000,000 Passenger Miles

	1941	1942	1943	1944	1945	1946	1947
Passenger automobiles and taxicabs	*	*	*	*	12,900	15,400	15,300
Rate	4.0	2.7	2.7	2.9	2.9	2.5	2.3
Buses	*	*	*	*	120	140	140
Rate24	.23	.22	.22	.17	.19	.21
Railroad pass. trains..	39	110	262	249	145	115	75
Rate14	.17	.31	.26	.16	.18	.16
Domestic scheduled air transport planes.	35	55	22	48	76	75	199
Rate	2.35	3.71	1.34	2.12	2.23	1.24	3.21
International scheduled air transport planes.	2	0	10	17	17	40	20
Rate	1.09	0	3.52	4.83	3.67	3.54	1.08

* Not available

High Safety Record Seen for 1948

Eight-month showing by domestic carriers well under 1947 fatality record; year may be one of best.

U. S. air carriers completed the first eight months of 1948 with high hopes that this year will be one of the best in history from a safety standpoint.

Despite the crash of a Northwest Airlines Martin 2-0-2 at Winona, Minn., on Aug. 29, the domestic carriers had only about 2.1 fatalities per 100 million passenger miles flown through Sept. 1. For all last year, the domestic fatality rate was 3.21 per 100 million revenue passenger miles.

► **Accidents Listed** — During the first eight months of 1947, 152 passengers were killed on domestic airlines as a result of three DC-4 accidents and one DC-3 mishap. In the same period this year, 84 passengers were killed on the certificated domestic lines.

Besides the recent Northwest Airlines mishap, in which three crewmen and 34 passengers died, the following fatal domestic crashes have occurred this year: Jan. 13, Oxon Hill, Md., Eastern DC-3, two crew and three passenger deaths; Feb. 7, Bunnell, Fla., Eastern Constellation, one crew death; Mar. 10, Chicago, Ill., Delta DC-4, four crew and eight passenger deaths; June 17, Mt. Carmel, Pa., United DC-6, four crew and 39 passenger fatalities.

► **Overseas Operations**—Internationally, U. S. flag carriers had only one fatal accident during the first eight months of this year in scheduled operations—the crash of a Pan American Airways Constellation at Shannon, Eire, on Apr. 15, with ten crew and 20 passenger fatalities. In the same period last year there were two fatal accidents with

eight crewmen and seven passengers killed. Fatality rate of U. S. flag carriers for all last year was about 1.08 per 100 million passenger miles against about 1.8 during the first eight months of this year.

Freight Forwarders Win 5-year Tenure

Freight forwarders have won their fight for a place in the fast-growing air cargo field.

Despite strenuous opposition from the certificated airlines, the Civil Aeronautics Board has adopted new regulations and issued an exemption permitting the forwarders to function as indirect cargo carriers for a period not to exceed five years. Admitting that its opinion is based on incomplete data, CAB decided that the need for air freight forwarders has been sufficiently established to justify their operations for a limited period during which essential experience can be developed, permitting determination of a sound permanent policy.

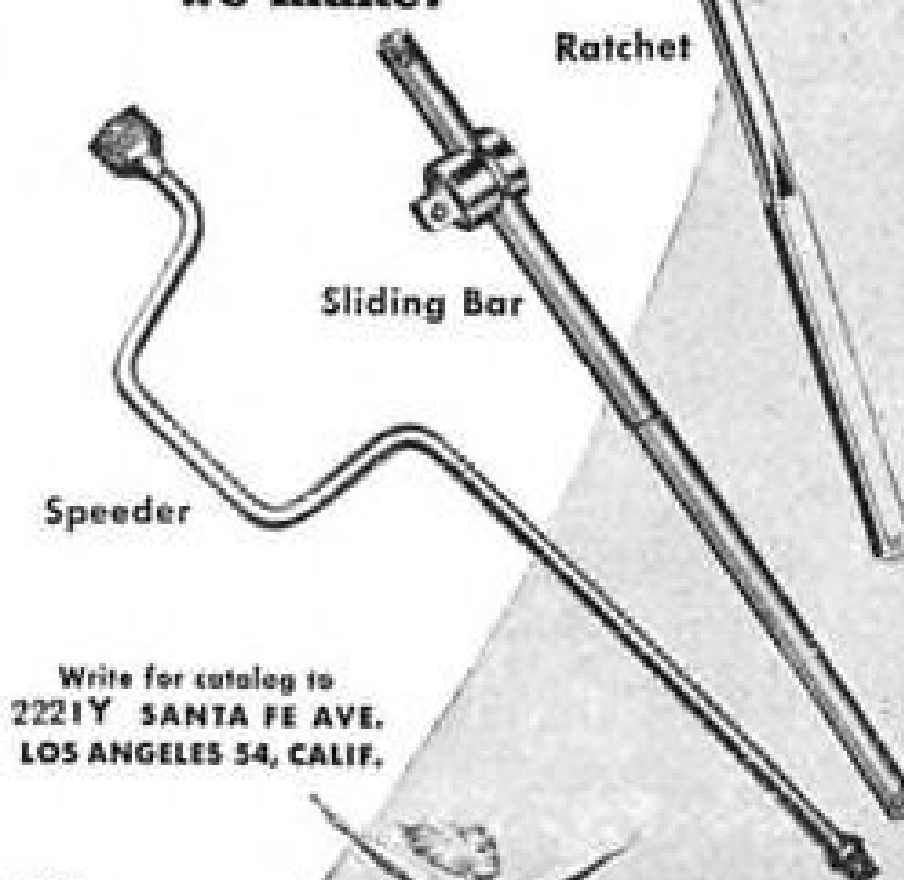
► **Authority Granted**—The Board authorized issuance of 55 letters of registration to forwarders, some of whom have operated in the past with doubtful legality on a "contract" basis or as shippers' agents. No limitation has been placed on the number of air-freight forwarders who may qualify for letters of registration or upon the number of points between which the indirect carriers may render service.

Obstructions are laffs

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...and all the rest of his big tribe of socket wrench handles and attachments—designed to turn nuts quickly and easily in hard-to-get-at places. As knuckle-savers, they're worth their weight in skin; as time-savers, they're money in your pocket. They are made in five drive sizes—from midget 1/8" to rugged 1"—to meet all requirements. You owe it to yourself to buy these tough, long-lasting attachments from your dealer. He's sure to have the ones you want because

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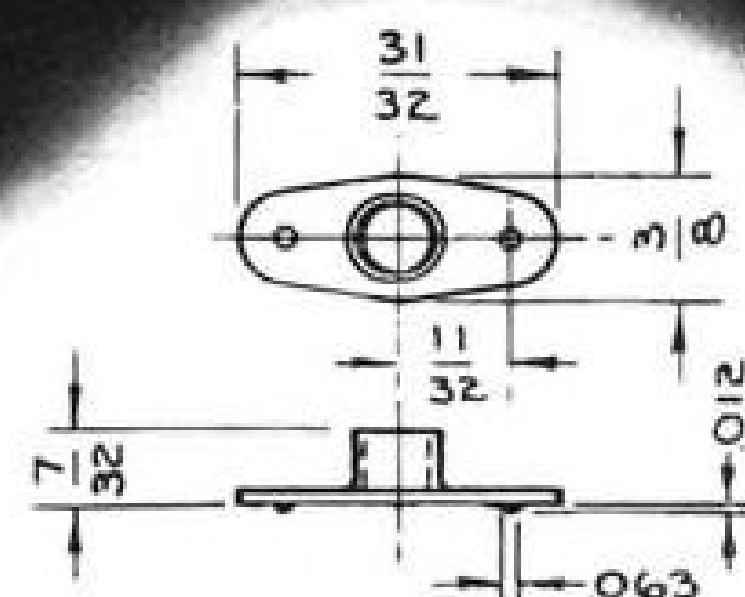


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Let SOL-A-NUT take over!

When you're looking for a self-locking nut built to resist high temperatures and corrosion, don't overlook SOL-A-NUT. This reliable fastener has already proved its stamina in many hot spots — on exhaust systems, pre-heaters, turbojet superchargers, jet engines and the like.

Sturdy, one-piece stainless-steel construction means long life — it will not corrode if damaged. Reasonable in cost . . . quick and easy to spot-weld, SOL-A-NUT meets U. S. Government standards.

Monadnock also manufactures SNAP-IT-TRIM and FABRI-LOC fabric and insulation retainers, Adams-Rite WEDJITS, AIRLOCS . . . has a wealth of experience in the fastening field. We welcome inquiries from manufacturers seeking reliable development and production facilities.

**MONADNOCK
MILLS** San Leandro
California

subsidiary of UNITED-CARR FASTENER CORP.

Uncertificated airlines, shippers and civic groups had backed certification or exemption of the forwarders, arguing that they would generate additional business and facilitate movement of cargo.

Forwarders arrange pickup and delivery, consolidate small shipments into plane-load lots, and take full responsibility for the cargo movement from point of its origination to final point of its destination.

► **Railway Express Status**—Coincident with the freight forwarder decision, CAB decided that it would continue in effect the exemption which permits Railway Express Agency to engage in air express operations as an indirect carrier under contracts with the certificated airlines. The Board found it to be in the public interest that air express remains a separate expedited service, differing in essential details from air-freight.

But Railway Express was ordered to negotiate new contracts with the certificated carriers. CAB refused to give REA a permanent certificate instead of an exemption; denied it authority to engage in air express services over noncertificated airlines; and deferred final action on the company's request to handle and process airfreight and act as an air freight forwarder for air transportation.

Honolulu Route Contested

Pan American Airways has asked the Civil Aeronautics Board to stay the Seattle-Honolulu route certificate recently granted Northwest Airlines, pending rehearing and reconsideration.

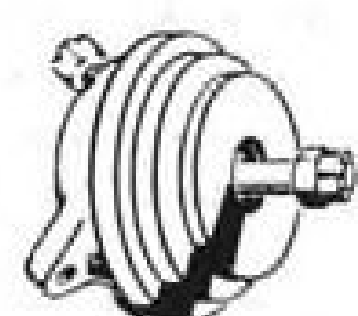
Charging that the decision was not legally effective, PAA pointed out that only one member of CAB who voted for the award in March was still with the Board at the time the President approved the opinion late in July. Pan American also declared that it can operate the Seattle-Honolulu route at a subsidy cost \$37 per passenger lower than Northwest and can compete more effectively with foreign flag operators in the Pacific.

Mexican Troubles

U. S. efforts to negotiate a bilateral air transport agreement with Mexico have again been suspended.

Failure to sign a pact despite compromises by both sides sets back further the date when Braniff Airways, western Air Lines and Eastern Air Lines will be permitted to activate routes to Mexico that were certificated in CAB's Latin American decision in the spring of 1946. U. S. and Mexico issued a joint statement expressing hope that an acceptable agreement may be reached eventually.

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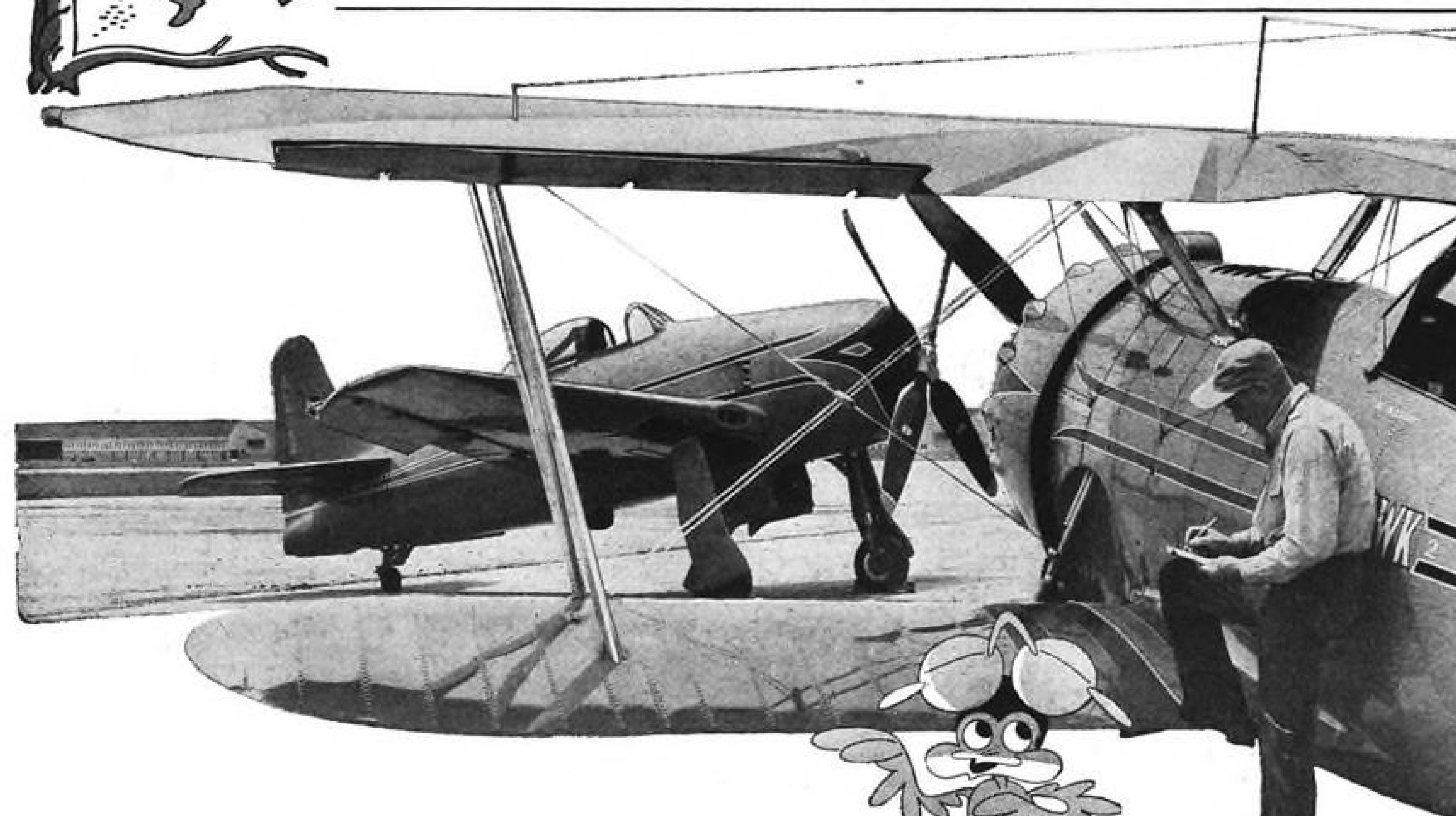
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The Birdmen's Perch

By *Major Al Williams, ALIAS, "TATTERED WING TIPS,"*
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh 30, Pa.



Gentlemen! The Little Known Facts Dept. is officially reopened!

(We closed up temporarily while we announced Gulfpride Aviation—Series D—the world's finest oil for horizontally opposed aircraft engines.)

We're going to be a little selfish though, and monopolize the department with our own "Facts" this month.

We got a new Gulfhawk, you see. Naturally, we want to tell you all about it and show you pictures. (Wouldn't you?)

Well, there she is, in front of the old

Gulfhawk. She's a Grumman F8, and so help us! She'll scamper up to 10,000 feet in 100 seconds from the chocks! We can get 2800 hp out of her with water injection, which is almost enough to get from here to there before we leave here!

With all that horsepower, the Navy version can get off a flight deck in practically zero winds. And mind you, we unloaded 1300 lbs. of armament from our ship. Imagine what ours will do!

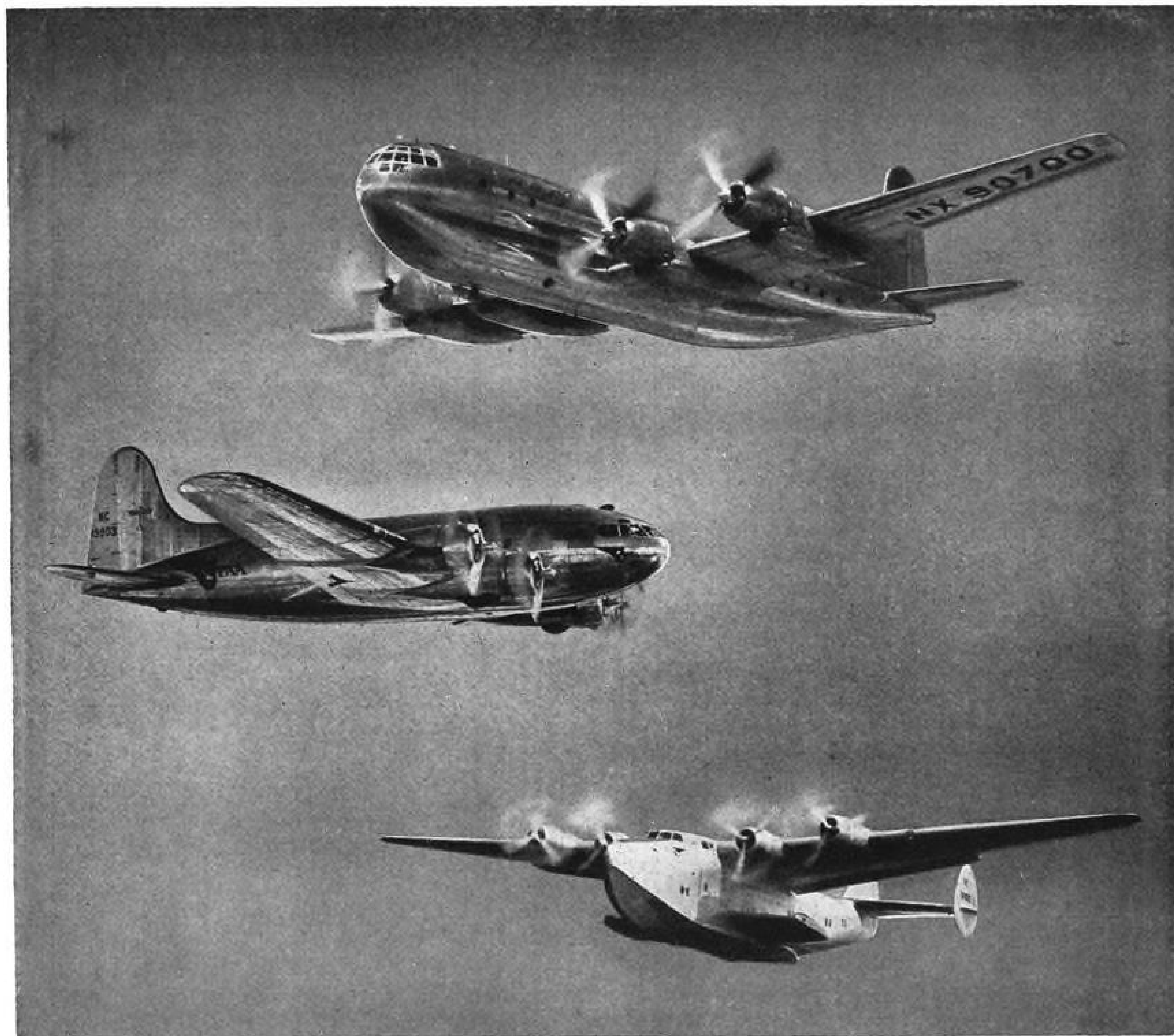
We can't tell you a whole lot about her yet because we haven't really had a chance

to get acquainted with her. But as we get more time in her, we'll keep you posted.

Meanwhile, after all your letters asking that the Little Known Facts Dept. be kept, it's time for you to start sending said "Facts" in again. Same rewards: Commission as Perch Pilot (bottom rung) for 1 printed "Fact". . . Senior Perch Pilot's rating for 5 "Facts". . . and Command rating for 20!

(And don't forget: use the new Gulfpride Aviation—Series D in horizontally opposed engines!)





Can you name all three?

They're Boeings—built by the pioneer in manufacture of four-engine military and commercial aircraft . . . members of the same family as the B-17 Flying Fortress and B-29 Superfortress.

At bottom, you see the Boeing 314 transocean Clipper. Just above it flies the Boeing Stratoliner. And at top is the newest of the three, the twin-deck Boeing Stratocruiser.

Carriers of presidents and prime ministers, Pan American's stout-hearted

314 Clippers and their sister ships flying British Overseas Airways colors transported 153,500 passengers, 10,709,000 pounds of mail and 10,241,000 pounds of cargo over 20,355,000 miles of flight routes to Europe and Asia. And now under new ownership they're still flying!

The Stratoliners, built by Boeing in 1939 and "drafted" in 1942, virtually blazed trail for the Army's Air Transport Command. They made 3000

wartime ocean crossings and flew 7,500,000 miles without mishap. They were the first transports with pressurized cabins.

Now comes the great Boeing Stratocruiser. This twin-deck luxury liner combines the ruggedness, dependability and stamina of her predecessors with matchless speed, comfort and spaciousness. Stratocruisers have been ordered by six of the world's leading airlines as queens of their air fleets.

Boeing is building fleets of Stratocruisers for these forward looking airlines:

PAN AMERICAN WORLD AIRWAYS • SCANDINAVIAN AIRLINES SYSTEM • NORTHWEST AIRLINES
AMERICAN OVERSEAS AIRLINES • UNITED AIR LINES • BRITISH OVERSEAS AIRWAYS CORPORATION

For the Air Force, the B-50 Superfortress, XB-47 Stratojet and C-97 Stratofreighter; for the Army, the L-15 Scout Liaison plane.

BOEING

Fear Still Prevents Many From Flying

Fear of flying is still proving a serious deterrent to the expansion of commercial air transportation.

A recent consumer survey by the St. Paul, Minn., Dispatch-Pioneer Press shows that 70.6 percent of the persons objecting to plane travel do so because they consider it unsafe. Another 10.8 percent say air transportation is too expensive, and 4.9 percent find flying unpleasant.

► **Other Reasons**—Minor reasons for avoiding the airlines: health considerations, 4.4 percent; employment by companies engaged in a competitive type of transportation, 2.9 percent; and undependable schedules because of weather conditions, 1 percent.

Of 105,126 persons participating in the consumer analysis of the St. Paul market, 96,933, or 92.2 percent, said they were not commercial airline travelers, and 8193, or 7.8 percent, said they were. Of all consumers paying \$50 or more monthly rent, 12.6 percent used the airlines.

Alaska Airlines Enjoined

Third division district court for the territory of Alaska has granted a permanent injunction to restrict Alaska Air-

lines from engaging in overseas air transportation otherwise than as permitted by the Civil Aeronautics Board. Action was brought by Pacific Northern Airlines, holder of a certificate between Anchorage, Kodiak, Naknek and Juneau, where it connects with Pan American Airways' link to Seattle.

CAB SCHEDULE

Sept. 21—Hearing on CAB's investigation of Challenger Airlines' certificate termination date. (Docket 3369.)

Sept. 27—Hearing on CAB's investigation of free and reduced rate transportation. (Docket 2737, et al.)

Sept. 27—Hearing on Challenger Airlines' application to serve Vernal, Utah, and Casper, Wyo. (Dockets 3183 and 3198.)

Sept. 29—Oral argument in TACA, S. A., foreign air carrier permit renewal and amendment case. (Docket 3016.)

Oct. 4—Hearing in Capital Airlines mail rate case. (Docket 484.)

Oct. 5—Hearing on approval of control of Parks Air Lines. (Docket 1670.)

Oct. 8—Hearing on Board's investigation of Monarch Air Lines' certificate termination. (Docket 3368.)

Oct. 18—Hearing on Board's enforcement action against Standard Air Lines. (Docket 3357.)

Picture Credits

British Information Service—33 (top); Flight—13; Landing Aids Experiment Station—63; McGraw-Hill World News—14, 15 (top two and bottom), 33 (bottom), 46, 64; USAF—11; Wide World—15 (third from top).

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• Available for delivery within ten days of date of sale.

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SHORTLINES

► **Braniff**—Has completed its billionth passenger mile without a fatal accident.

► **Capital**—President James Carmichael disclosed his company has conducted informal discussions on merger with Braniff, National and Delta, but "no conclusions have been reached and nothing definite is in sight." . . . Company will increase passenger fares from 5.5 to 6.1 cents a mile on all routes but the highly competitive New York-Detroit, Detroit-Chicago and Washington-Chicago links.

► **Chesapeake Airways**—Has begun DC-3 passenger service between Washington and the Eastern Shore of Maryland under a temporary exemption from CAB.

► **Colonial**—Has been ordered by CAB to start service to Poughkeepsie, N. Y., by Oct. 1. Carrier had advised the Board the operation would not be self-supporting. . . . Allentown-Bethlehem, Pa., has been made a certificated stop between Scranton-Wilkes-Barre and Reading, Pa.

► **Pan American Airways**—Together with other carriers is increasing service between the Pacific Northwest and Alaska to handle additional business produced by the West Coast longshoremen's strike. . . . Company will begin service to Barcelona, Spain, on Oct. 15, with three flights weekly from the U. S. via the Azores and Lisbon, Portugal. Round-the-world flights will be increased from two to three weekly at the same time.

► **Philippine Air Lines**—Has asked its government for protection against the "ruinous and unjustifiable" competition of two U. S. air carriers operating into the country—Pan American Airways and Northwest Airlines. PAL which flies to the U. S. said that subsidy enabled PAA to make five trips weekly and NWA four trips weekly into the Philippines without traffic justification. PAL declared that since it operates without subsidy its survival is threatened.

► **Slick**—Has received CAB permission to carry military cargo between eight Air Force bases for a period not exceeding six months.

► **Trans-Atlantic Airways** — CAB has formally canceled the letter of registration as an irregular carrier issued to Edward W. Tabor, doing business as Trans-Atlantic Airways.

► **TWA** — Will inaugurate all-sleeper Constellation service between New York and Paris Oct. 1.

► **United**—Is considering an interchange agreement with Western Air Lines which will give Minneapolis through DC-6 service to the West Coast.

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SEARCHLIGHT SECTION

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These inventories are available for inspection at our warehouses at Astoria, L. I., New York, Tulsa, Oklahoma and Fort Worth Texas and offered FOB these points for domestic shipment at very attractive prices.
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Hamilton Standard Propellers—2D30 (6101A-21). No time since overhaul by Ford Motor Company. For AT-11, C18, C45 & D188 Beechcrafts \$99.50 ea. 2D30 (6107A-15) Used but in excellent condition, \$99.50 each. Blades 6101A-12 at \$39.00 each. Contact Jack Hale, Ohio Aviation Company, Dayton Municipal Airport, Vandalia, Ohio. Telephone 4-4675.

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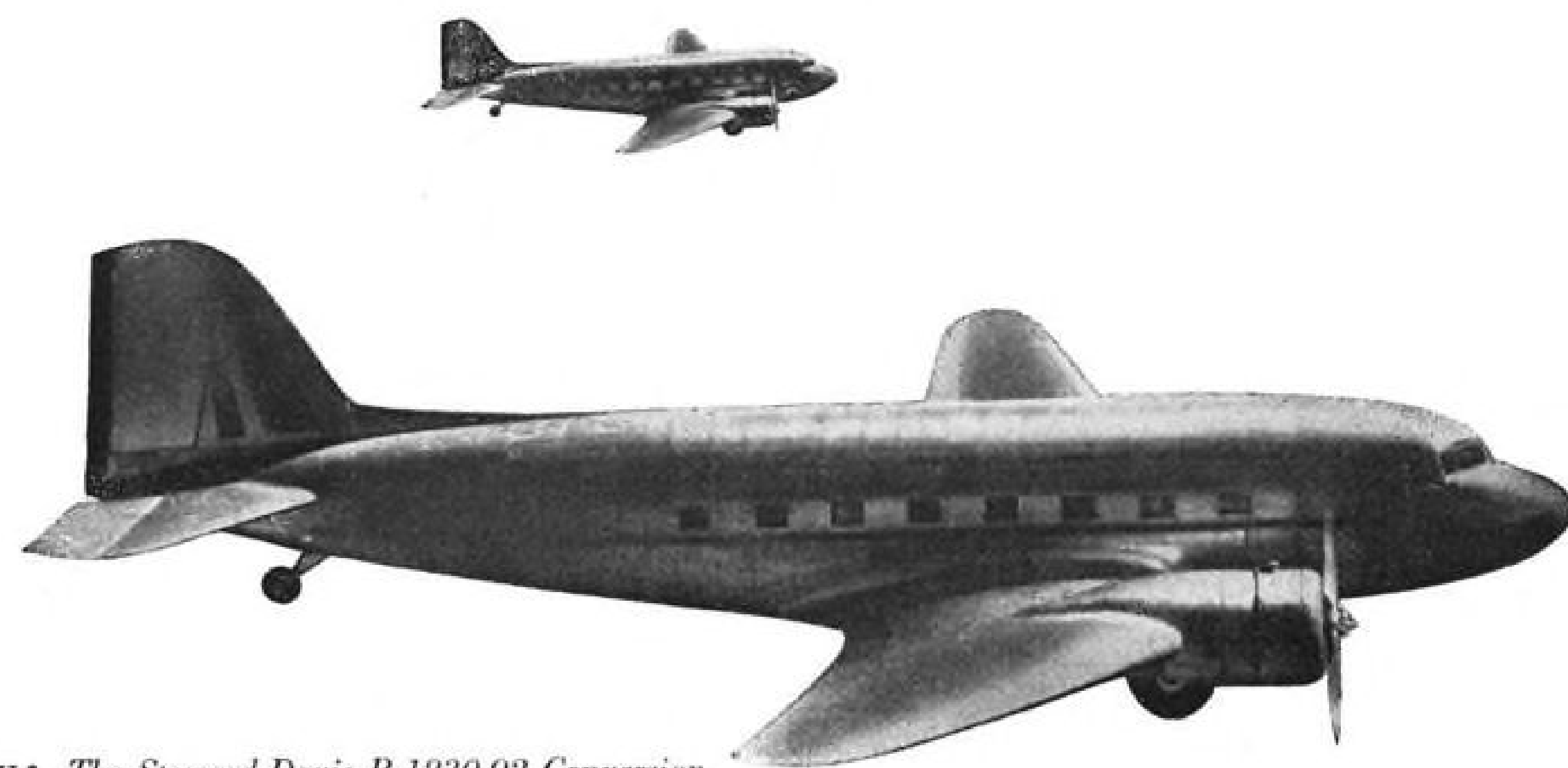
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ENROLL NOW FOR NEXT CLASS
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an *Announcement* of importance to operators requiring the Pratt & Whitney R-1830-92 engine



exchange policy: The Steward-Davis R-1830-92 Conversion is now available for \$1695 with the exchange return to Steward-Davis of a crated run-out R-1830-92, complete with carburetor, magnetoes and ignition harnesses. Freight charges for the return of this engine will be paid by Steward-Davis.

On October 1st, 1948, the cash price of the Steward-Davis R-1830-92 Conversion will drop one hundred dollars. This reduction in price will be based on the return to us at our expense of a run-out R-1830-92 engine.

What will this mean to you as an operator? This policy will slash the price of the Steward-Davis R-1830-92 Conversion by one hundred dollars every time you purchase after October 1, 1948. This will be particularly important to you if your operations are outside the United States in an area where dollar credits are difficult to arrange. This will mean that the possibilities for direct savings of your capital are great, for not only will you save one hundred dollars each time you purchase an engine, but these savings will continue to compound as you repeat your orders. At the twelfth purchase for instance, you will have earned twelve hundred dollars on the investment of but a single run-out engine.

Why have we instituted this program? Because we wish to be in direct contact with you as the actual operator of your flight operation so that our merchandising policy of *performing a service* may be distinguished from *making a sale*. Because we wish to show you how our co-operation can largely shoulder the engine procurement and overhaul problems which you find a prime factor in the operation of your business. To do this to our mutual profit and advantage we realize that such a plan must offer you an incentive in quality, service and savings which will make it wise and sensible for you to purchase all, or at least a major portion of your engines from us. We believe that the combination of this fine engine, this new lowered price and this exchange program are these incentives.



The Steward-Davis R-1830-92 Conversion, completely overhauled, warranted for 100-hours, test-run, prepared for long-time storage and packaged for shipment, is now immediately available from stock at WILLIS AIR SERVICE, INC., Teterboro Air Terminal, New Jersey; WESTCOAST AIRCRAFT, Boeing Field, Seattle, Washington and STEWARD-DAVIS, 13501 South Western, Gardena, California.

STRICTLY PERSONAL

PENTAGON INTERVIEW—We dropped by Secretary Symington's office for an hour the other day while in Washington. The Secretary looks fit, but we don't envy him his tough job. He's hoping the aircraft industry won't let him down in meeting delivery schedules. He even suggested an editorial on the subject. Obviously, any delivery delays will put him in the middle for sure—between the economy-minded Congress who will want all the planes it buys to be turned out on time, and on the other side the justifiably hard-boiled Defense Secretary and the Budget Bureau. That's why he hopes the plane manufacturers will realize he's "with 'em—not agin' em," if he prods them occasionally.

Steve Leo, the secretary's No. 1 press aide, verified to us that he'll resign about year-end, probably to return to the Gannett papers. He has been on leave from the chain since 1942. He came to the Air Force to handle unification public relations and feels that job is done. He denies reports he'll run for Congress or a public office.

TAILPIPE EXPLOSION—AVIATION WEEK's editors get up and around. You read Aug. 2 about Engineering Editor Bob McLaren's hop in a TF-80C. Well, Scholer Bangs, our Los Angeles department, had a ride too. He wrote about it in a personal memo. Here's his story that he never expected to see in print:

"Still sort of pooped today after a ride in the TF-80C two days ago. At the start, still on the ramp, we had a tailpipe vapor explosion which jarred the plane as if a truck had hit us.

"While we sat there, mechanics stripped off fuselage plates to make certain no damage had resulted. Once off the runway, I noticed that Fish Salmon, my pilot, was wagging the stick in wide sweeps with practically no response.

"Over the intercom he said: 'No hydraulic boost on the ailerons.' Then: 'No hydraulics anywhere!' (On the ground the crew noticed that our wheels were hanging half down.)

"We were heading over the Hollywood Mountains by then and, to make me feel easy, I guess, Fish had me take the stick to see that the plane could be flown without control boost, although it was stiff and sluggish.

"In a few seconds whatever was wrong—maybe sludge in the accumulator or in a by-pass valve—cleared and we got a full restoration of hydraulics.

"When we got back down a mechanic looked at the G meter record and whistled. Salmon at one time had given me (I had asked for it) 7½ G. Not long enough to do any damage, but enough to be a stiff jolt for the two seconds we were in it. It seemed like two hours."

SUPERSONIC MORTIFICATION—Max Cook is one of the country's most popular newspaper aviation editors. So we were properly embarrassed when he didn't read one of Aviation Week's biggest stories of 1948. He told the United Press and the world Sept. 10 that "the U. S. Air Force F-86 jet fighter has exceeded the speed of sound." Our lead story June 14 started out: "North American's XF-86 has flown faster than the speed of sound. The F-86A, now being manufactured, will be the first supersonic combat plane to go into quantity production." The UP also printed our story and we have a big harvest of clippings to show for it.

Time missed seeing us too. Its Aug. 9 issue has the F-86 "already nibbling gingerly at the speed of sound," and adds insult to injury by telling us that "the only airplane, so far as is known, to fly faster than sound is the . . . X-1."

If anyone's interested, our June story was verified privately by unimpeachable sources—as the phrase goes—before we printed it.

STRICTLY CORN—First fan letters have arrived on this department. Bill Key of Hill and Knowlton writes from the Aircraft Industries Assn. in Washington: "Strictly Personal as a title is strictly corn. Why not Wood Carvings, Woodent-You-Know, or Wherefor Art Thou Security? P. S. It's a good idea and might even be popular."

And Ralph W. Brown from Sperry Gyroscope Co. says: "Speaking of rhubarb. We note AW draws Douglas emissary as reverberating on credit of Martin B-45. Thought North American nursed B-45s. Double rhubarb."

(Brown is wrong. It was Martin emissary reverberating. Brown is right about the B-45 nursery. It's the Martin B-48. Blessed typos.)

STORY OF THE WEEK—Tide magazine reports the story of the week: "Bill Wright, of Delta Air Lines and Chattanooga, ran his Plymouth into a little accident recently and one of the front fenders got curled up like a new permanent. So Wright painted a sign on the car: 'CAN YOU TELL WHICH FENDER HAS THE TONI?'"

R. H. W.

WHAT'S NEW

New Books

"Radio and Instrument Flying, Instructors Manual," revised through Apr. 1, 1948. Prepared by Charles A. and Allan C. Zweng for the Pan American Navigation Service, 12021 Ventura Blvd., No. Hollywood, Calif. 360-pages, illustrated, multi-lithed, paper cover. No price shown.

"Aeronautical Training, A Quiz System," covering navigation, meteorology, aircraft, aircraft engines, air commerce regulations and air traffic rules. Prepared by Charles A. Zweng for the Pan American Navigation System, 12021 Ventura Blvd., No. Hollywood, Calif. 445-pages, illustrated, multi-lithed, paper cover. No price shown.

"Aircraft Instrument Maintenance," by Earl F. Werner, former technical advisor, U. S. Air Force. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 466-pages, illustrated, price \$7.50.

"Aircraft Engines," by Col. Rollen H. Drake, author of the Drake Aircraft Mechanic Series. Published by the Macmillan Co., 60 Fifth Ave., New York, N. Y. 348-pages, illustrated, price \$5.90.

New Reference Books

"Editors Reference Book on Precision Castings," as produced at the Bayonne Works of International Nickel Co., Inc. Multi-lithed description of operations, equipment, properties, advantages and limitations. Paper cover, illustrated.

"The Art of the Aviation Engine," by F. R. Banks, technical manager, Associated Ethyl Co., Ltd., Artillery House, Artillery Row, London S. W. 1, England. A paper presented before the French Association of Aviation Engineers and Technicians, Paris, as the first Louis Bleriot Lecture.

"NATA Air Taxicab," a list of 432 members of National Aviation Trades Assn., by state and city, who are equipped to offer special passenger or cargo charter service. All hold current operating certificates under Part 42, Civil Air Regulations, and letters of registration to serve as noncertificated irregular air carriers. This list will be revised Dec. 31, 1948, and quarterly thereafter. Copies available free from NATA, 1346 Connecticut Ave., N. W., Washington, D. C.

"Molybdenum—Steels, Irons, Alloys," 391 pages. No price shown. Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.

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EDITORIAL

Air Fares Bounce Off the Ceiling

Air transport fares reached their peak between Sept. 1 and Sept. 13 then started falling, and fast. The prospect is for definitely lower fares. A revolution in the business is underway.

Only 10 days after it threw a 10 percent premium fare on its DC-6s, United Air Lines announced it was dropping the extra charge on Sept. 13. That was the day American's new family fares went into effect. But that wasn't all. John Q. Public got another break. United decided to retain its 5 percent reduction on round trip tickets. American, which had refused to clamp a premium on its Sixes, immediately met United's round-trip reduction.

So the public gains. It will also gain from American's precedent-setting "family fare plan". This is obviously an experiment. On any trips started Monday, Tuesday, or Wednesday any adult may buy a ticket at the regular rate and other members of the immediate family may travel for only half fare. At least, a seat sold at reduction brings more revenue than one not sold at all.

Other significant developments, already publicized, are Pan American's new second class tourist fares between the U. S. and Puerto Rico, and reduction of trans-Atlantic fares Oct. 1.

Meanwhile, the increasing demand for lower fares and trial of second class service received recognition last week from so astute an authority on air transportation as Sir William P. Hildred, director general of the International Air Transport Association.

Sir William, in his annual report presented Sept. 14, says:

"The Traffic Committee has recognized that the time is not far off when the air transport industry will need to move into the field of second class fares, and has expressed the view that this development must take place on a basis which will get the airlines into mass travel.

"An enormous and practically unlimited passenger market has not yet been tapped because it cannot afford the present rate structure, and the Committee rightly feels that development of a lower quality service for a lesser fare is fundamental to the success of the airlines. I hope we shall get vigorous conference action on this for it is where business lies."

Elsewhere in his report, Sir William says:

"What I have said applies no less to the international than to the domestic situation . . . I do not think the irregulars themselves would suggest that they offer as comfortable a service as the regular operators do. They offer a pretty much stripped-down austerity service. I am all for the benefits of honest competition and realize to the full what a spur competition can be. But there is a point below which one cannot go because in the airline business with 60 passengers up in the air at 20,000 feet, no paring down of expenditure on maintenance can be tolerated for a moment.

"The fact that these operators can find a ready market indicates that there is a growing public who wish to travel by air, and I have long felt that IATA members might consider, as the ships and railways do, different grades of service, stripped-down austerity services, as well as services offering luxury and comfort. . . . The airplane must strive always to become the vehicle for the factory-hand's holiday, and I hope I shall hear more of that thought coming from the conferences and IATA members as time goes on."

AVIATION WEEK could not express its policy on the subject any more clearly than Sir William has outlined it above.

Pan American, it now develops, had hoped to institute second class fares first with Boeing Stratocruisers. Its officials inform AVIATION WEEK that "the only compelling limitation" on setting

a second class rate schedule has been equipment shortage. "The Convair has in the past two months relieved equipment shortages in the Latin American Division."

PAA reports the economic background of the new Puerto Rico service as follows:

The company this year surveyed total passenger traffic, including steamship, to and from San Juan. This totaled more than 100,000 for the first seven months. This figure was broken down as to type of traffic.

"We believed in the need for stabilizing a sound air transport service which will be available to this class of traffic and on which they can rely for financial stability, schedule performance, and highest standard of safety.

"We then did two things. First, we tried to arrive at what we considered an equitable and fair rate which would reach these people. In order to do this, we consulted the Puerto Rican government, we conferred with travel agents who were selling the business and, of course, we surveyed the competition. . . .

"Seventy-five dollars, we discovered, was within the pocketbook-range of this new group. Second, we had to decide whether \$75 was an economically feasible rate. There were several areas of economizing. There was one PAA would not consider—we would not budge on our operations standards. These, the highest in the industry, are inflexible.

"By taking out the galley and the coat rack, PAA engineers figured that they could increase the seat capacity of the DC-4 by 20 percent, from 52 to 63. However, we had to get the fare down to \$75. Our present one way fare is \$133. Reducing it 20 percent as a direct result of adding 20 percent more seats would have brought the fare down only to about \$106. We had to look further. An additional expense that might be eliminated was meals and some of the other extras we normally provide in the luxury service, such as a bar and extra attendants. We did not completely eliminate food service. We plan to schedule the plane so that it leaves New York late at night and arrives around breakfast time. We plan to serve a continental breakfast—fruit, coffee, sweet roll—but not an elaborate meal. This saved us a little more. . . .

"At this point, relying on our experience with the \$150 round trip excursion rate in the summer of 1947, we had to take a gamble. We had to assume that because of the rate we would carry more passengers per plane than on the luxury service, i.e., a 10 percent increase in load factor. Whereas, our regular service to Puerto Rico breaks even at a load factor of between 55 and 65 percent, on the new tourist service we will have to have a load factor the year-round of between 65 and 75 percent.

"We believe we can achieve this load factor and to do so we will begin aggressively selling this new type of traffic. We plan to open a Harlem ticket office. Limousine service will leave directly for La Guardia from there.

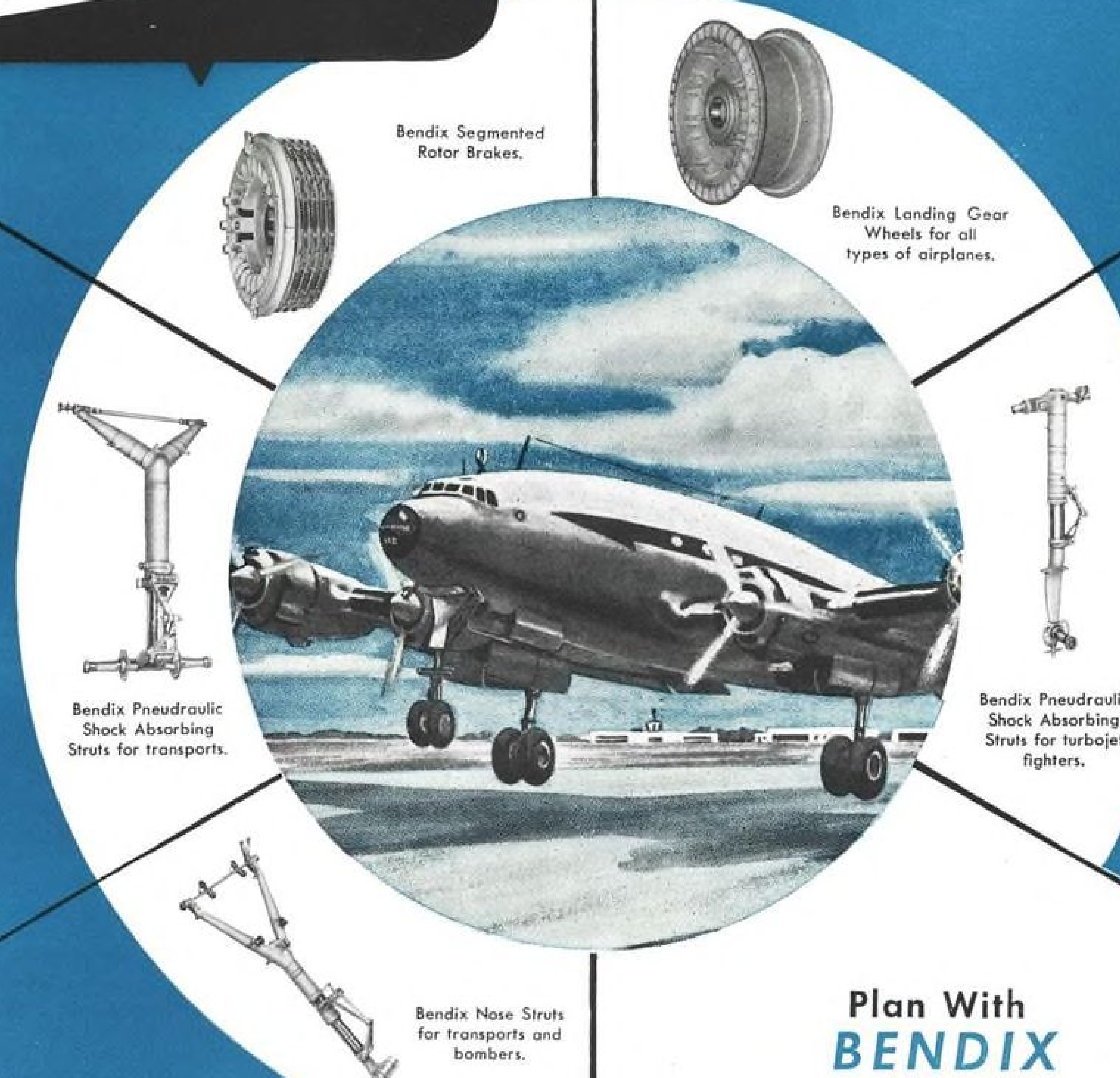
"At this point we are most confident. We are hopeful that this move will encourage further thought and action on the subject of tourist fares in other parts of the world."

So Pan American decides to take a chance. Instead of going to CAB or the courts to try to put its non-scheduled competitors out of business, it takes the attitude that if the people want to fly at low rates it too will give them the service, and let the best man win. We have not always agreed with PAA in the past, but it seems to us they—and American—are teaching the domestic industry an important lesson. Instead of denying blindly that any traffic potential exists, they go out trying to capture it.

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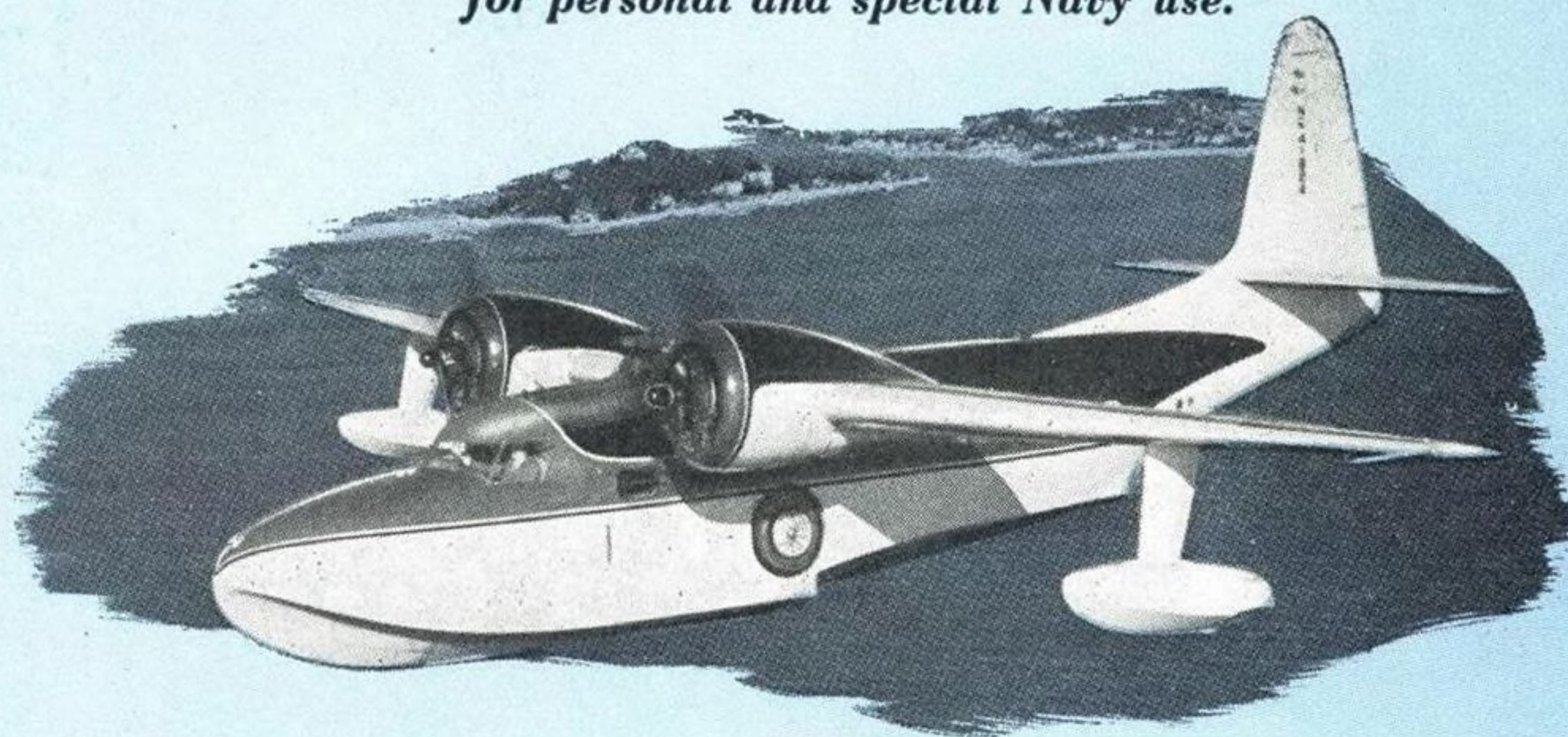


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