

Aviation News

McGRAW-HILL PUBLISHING COMPANY, INC.

MAY 8, 1944

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400-Passenger Super-Transport

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Legal problems hold up plan for segregation, storage and sale of surplus materials; title to be transferred to U. S.....Page 12



First Flight Photos of Two New Helicopter Models: Despite predictions of cautious engineers that popular use of helicopters is at least ten years off, work on machines for post-war production continues apace. Top photo shows a two-place job which Bell Aircraft Corp. has been flying in secret more than a year. Lower picture shows a model that has been undergoing endurance tests by Aeronautical Products, Inc., of Detroit and Washington Court House, Ohio. (Story on page 7.)



Buy War Bonds — to Have and to Hold

Through the Roof

The whole vast area of conquered Europe is a Nazi stronghold. Massive walls and powerful fortifications defend it—all as nearly impregnable as Hitler can make them.

But overhead there are no walls. It is *through the roof* that Allied bombers have inflicted the heaviest blows on Germany's war-making machine.

To the valiant young Americans who man the Boeing Flying Fortresses, "through the roof" now has an added significance. On days when there was a thick overcast, Europe was once safe from precision bombing. Today new navigation devices enable the Fortress

bombardier to hit his target through dense cloud cover with almost the same uncanny accuracy as in clear air. The first raid by the Forts on Berlin was made under just such conditions.

The deadly bombing done by the big Boeing planes has become a matter of wonder, not only to our Allies but to the enemy. After Flying Fortresses had demolished the Messerschmitt plant at Regensburg without allowing a single bomb to fall on a hospital which was practically a part of the factory area, our Eighth Air Force fliers got a special radio message from the Luftwaffe. The net of it was: "Congratulations on your accuracy. We don't know how you do it!"

The Fortress crews know the answer. It is done by cool courage, skill and training, and by the bombing stability of the steady-flying Forts themselves.

Some day Boeing's design, engineering and manufacturing skills will be turned again to products of peace. You can be sure of any such product . . . if it's "Built by Boeing" it's bound to be good.

NEW AIR FORCES COMBAT FILM

The Army Air Forces motion picture, "The Memphis Belle," shows heroic crews of Boeing Flying Fortresses in actual combat over Germany. See it at your local theater.

DESIGNERS AND BUILDERS OF THE FLYING FORTRESS • THE NEW B-29 SUPERFORTRESS • THE STRATOLINER • TRANSOCEAN CLIPPERS

BOEING

THE AVIATION NEWS

Washington Observer

CMP REORGANIZATION—Wholesale revisions in the Controlled Materials Plan are in the cards, although nothing definite has taken shape. Proud of its achievement in solving the chronic materials distribution problem, WPB shrinks from abandoning CMP but realizes the plan can't be retained permanently, with re-conversion problems in sight. Total result to date: Much studying and drafting, many meetings, no decision.

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FORWARD PRICING SYSTEM—Army, Navy and Maritime procurement officers are engrossed in refining the "forward pricing" plan which will begin to replace renegotiation as a means of capturing excessive profits. No replacement date is set but Gen. Somervell feels the changeover should come about midyear.

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LABOR'S VOICE—Labor is demanding and getting increasing attention in contract termination discussions. Subject of dismissal wages to discharged workers is recurring frequently. Sen. Murray, for example, after careful consideration, believes the medium of dismissal wages is inadequate to provide financial aid to those who will become unemployed as a result of war contract termination. In his opinion the only satisfactory way of coping with that problem is through unemployment compensation.

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MUNITIONS COST BASIS—When WPB announces its monthly munitions production volume, aircraft as well as other war items are now figured on the basis of costs to the government as of August, 1943. Formerly, 1942 costs were used. Since all items declined in cost as result of increased production, the number of

aircraft making up any designated dollar volume is relatively larger than previously.

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DEMAND FOR LAWYERS—Although opportunities for Army commissions have shriveled, the adjutant general's office is surveying applications filed by lawyers who will be needed in contract termination work.

★ ★ ★

WTS HOPES FADE—Washington opinion is that only a miracle will save any part of the War Training Service program. Petroleum hearings by the Interstate and Foreign Commerce Committee may delay action for two weeks on the House version of the Civilian Pilot Training Act Bill. The Senate has already passed Sen. McCarran's bill to continue the program.

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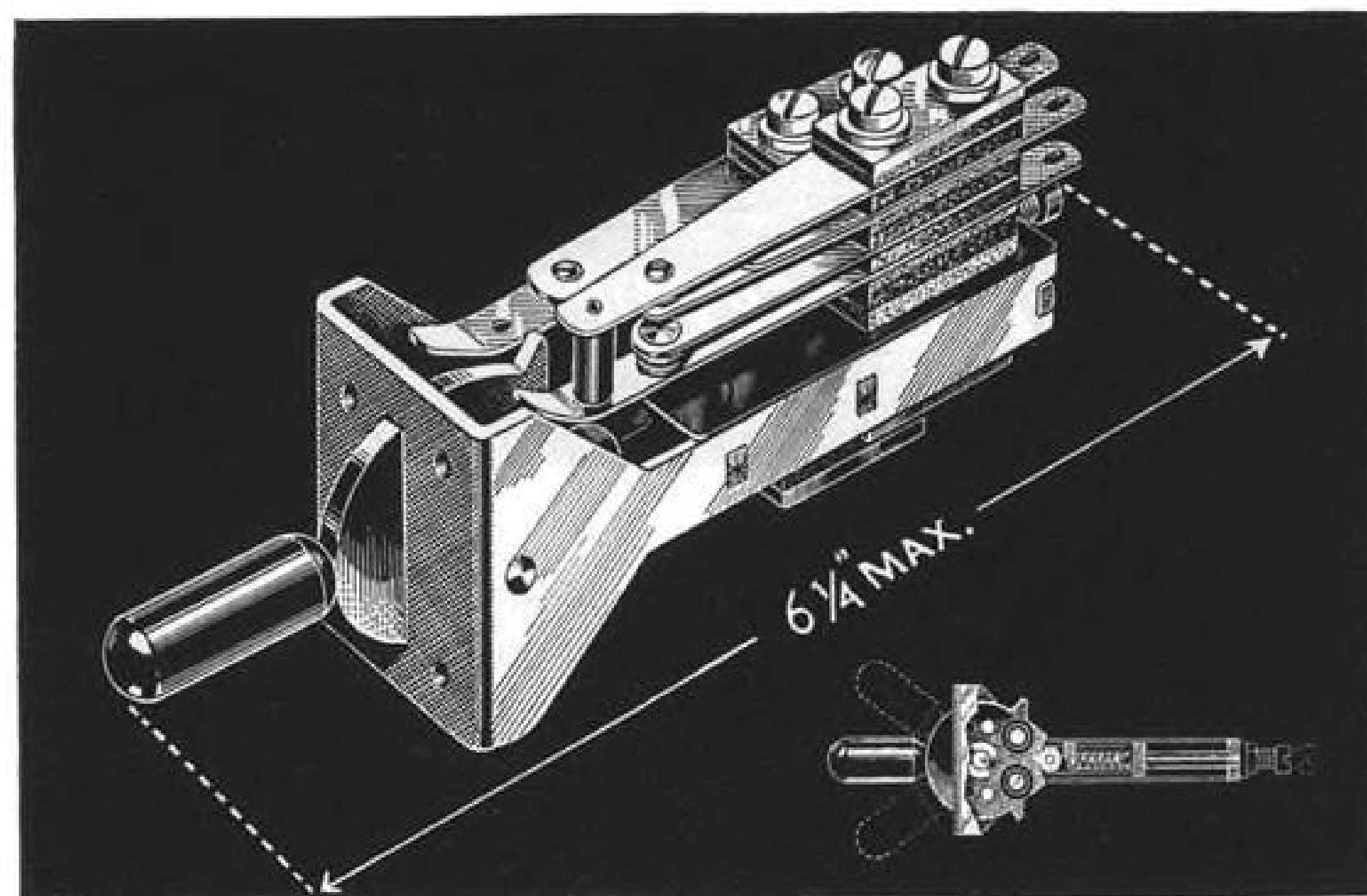
MANPOWER STATISTICS—High Army officers give this explanation for conflicting statements on manpower requirements. First the Army must estimate its needs for men as much as seven months ahead. The War Department requires a month to get corrected figures on the number of men already in the Army. Then it gives Selective Service 60 days advance notice of what requirements will be. Next the Army must estimate its losses for the next four months to obtain replacements. Then, if Selective Service fails to deliver its quota, or catches up to schedule, all estimates are thrown off balance. Big need from now on is to replace losses—which means more young men.

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SURPLUS SALES EXPERIMENT—The manufacturing industry is watching the results of Beech Aircraft's experiment in channeling

Record-smashing Constellation at Wright Field for Army tests.





You Can Have This MOSSMAN HEAVY DUTY LEVER SWITCH Almost Any Way You Want It

If your requirements call for a Heavy Duty Lever Switch with up to 48 springs, use the Mossman 4101 Switch. There is nothing stereotyped about this heavy duty switch except the quality.

Any combination of six basic contact forms are available in order that this versatile switch shall most exactly meet your needs. Inverted forms may also be provided.

Standard heavy duty contacts give the Mossman 4101 Heavy Duty Lever Switch a rating of 10 amperes, 110 volts A.C. (non-inductive). These are of 3/16" diameter fine silver. For higher rating, extra heavy duty contacts of 5/16" diameter, silver alloy, permit use of 20 amperes, 110 volts A.C. (non-inductive).

But when it comes to high grade, precise construction of quality materials, the Mossman 4101 Heavy Duty Lever Switch permits of no deviation.

The Mossman 4101 Heavy Duty Lever Switch is built to give positive action at all times without regard to vibration or shock. The positive action is reliable and independent of the pressure of the contact springs.

Send for new catalog for complete description of the 4101 Lever Switch and the many other Mossman precision electrical components. These include many types of heavy duty multiple circuit lever switches, turn switches, push switches, plug jacks and special switching components.

DONALD P. MOSSMAN, Inc.
6133 N. Northwest Highway, Chicago (31), Illinois

MOSSMAN
Electrical Components

AVIATION NEWS

May 8, 1944

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Copyright 1944, Vol. 1, No. 41. Published weekly by McGraw-Hill Publishing Co., Inc., price 50c a copy. Allow ten days for change of address. Subscription rates—United States, Mexico and Central and South American countries, \$5 a year, \$8 for two years, \$10 for three years. Canada, \$6 a year, \$10 for two years, \$12 for three years. All other countries \$9 a year, \$14 for two years, \$18 for three years. Entered as second-class matter July 31, 1943, at the Post Office at New York, New York, under the Act of March 3, 1879. Printed in U.S.A. Cable Address "McGrawhill, New York."

James H. McGraw, Founder and Honorary Chairman; James H. McGraw, Jr., President; Howard Ehrlich, Executive Vice-President for Business Operations; John Abbink, Executive Vice-President for Editorial Operations; Curtis W. McGraw, Vice-President and Treasurer; Joseph A. Gerardi, Secretary; J. E. Blackburn, Jr., Director of Circulation, 330 West 42nd Street, New York 18, N. Y. Branch offices: Chicago, 520 North Michigan Ave.; San Francisco, 68 Post Street; Los Angeles, 601 W. Fifth Street; Aldwych House, Aldwych, London, W. C. 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta. Return Postage Guaranteed.

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surplus through a separate Beech-owned company. The surplus-selling company is moving about \$300,000 in surplus steel, aluminum and other materials for Beech and other companies. It handles materials for other companies in that area on a fee basis. It may prove valuable even when the new surplus plan goes into effect, since it permits quick transfer of surplus inventories from the parent company in the event of cancellations.

★ ★ ★

NEW BOMBING TECHNIQUE—New methods of bombing railroad yards in occupied Europe are making the current raids more effective than might be generally supposed from earlier experience. Hitherto, bomb damage to railroad centers has been comparatively easy to repair. Terrific concentration of large bombs on rail centers now is ploughing up rights-of-way to such an extent that repair is becoming a stupendous task. New photos show "highly spectacular" damage. Putting the rail centers out of action and keeping them out of action will be one of air's contribution to the invasion.

★ ★ ★

ACCURACY TEST—Faster photo interpretation methods to afford newsmen and the public an official version of bombing mission results quickly and accurately, and a curbing of eyewitness reports may combine to give the American public a truer picture of the bombing of Germany. Eighth Air Force Intelligence officers are clamping down on crewman reports of "great fires," "target devastated" and "smoke rising thousands of feet in the air." They point out that a salvo of heavy bombs will create a lot of smoke and dust, even in a bare field, and that later photo missions show that the primary target was missed completely.

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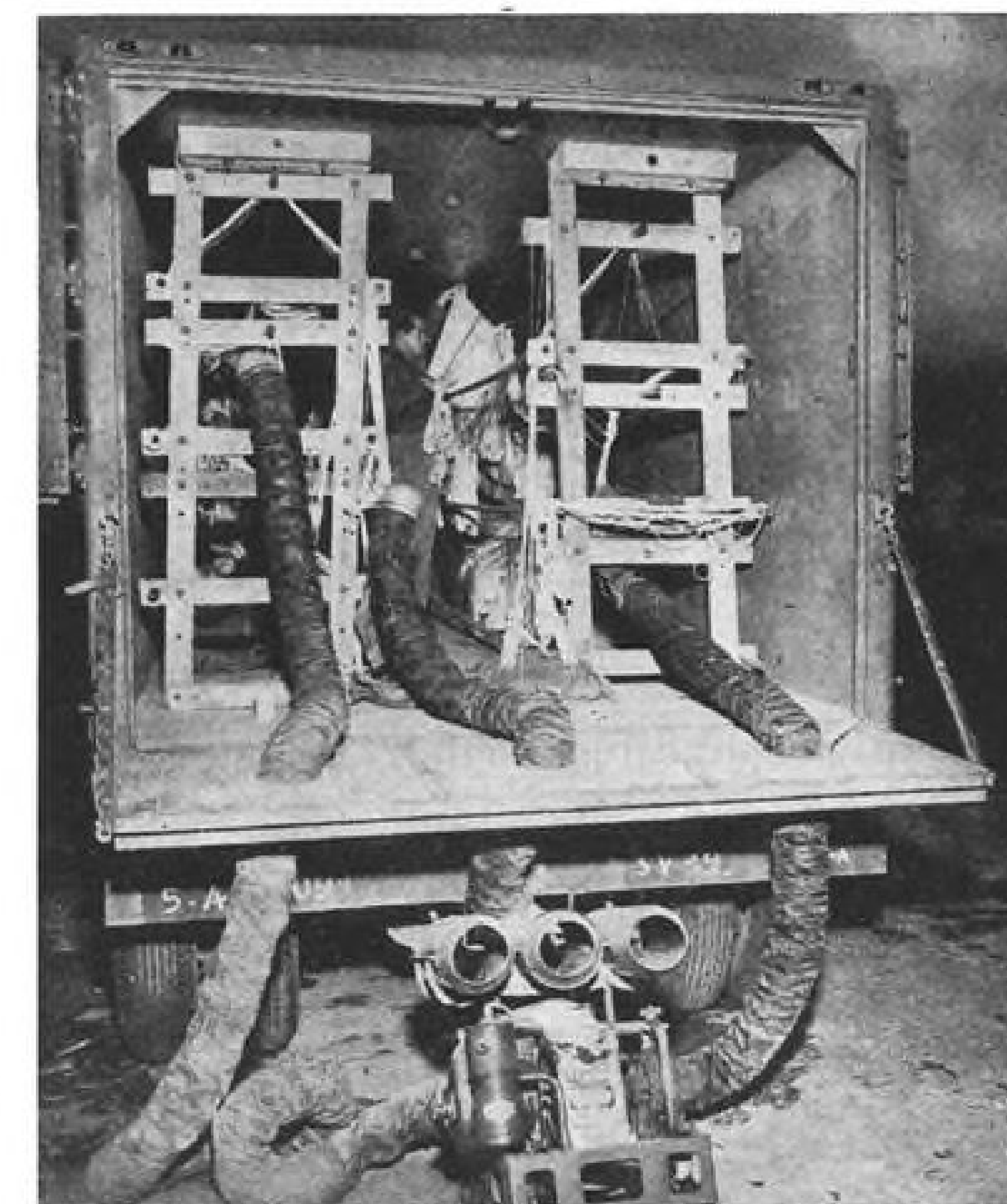
FLYING BOAT STOCK RISES—Success of the Martin "Mars" now flying, and reports that future production models will carry substantially more cargo more economically than the prototype, has aroused wide interest in the industry. In more than one company engineers are studying the "Mars" projected ton-mile costs and resurveying possibilities of the super-flying boat. Costs of ten cents a ton mile are seen as excellent possibilities, with some experts claiming these can be reduced within a year or two to five cents.

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COAST GUARD AVIATION—Although it has received Martin PBM's for patrol, the largest aircraft it has flown, it is unlikely that the Coast Guard's aviation unit will take over any four-

Washington Observer

engined ships in the next year. It is not generally realized that Coast Guard aviation personnel now total only 250 with 154 of these commissioned officers. There are now about 260 Coast Guard planes, of which all but 45 are owned by the Navy, although a total of 490 will be in operation by July of 1945, including 186 helicopters, 175 multi-engined craft, and 132 single-engined planes. The Coast Guard has taken over the Greenland patrol and on the West Coast has established an air-sea rescue group. Despite the increase in aircraft to be operated in the coming year, the average number of Coast Guard Flyers in training at any time will drop from 250 to 150. The Navy's Pensacola base, aviation training stations, and pre-flight schools are utilized entirely for Coast Guard training. Officials estimate the average course — recently shortened—now costs \$7,500, including overhead, gas, pay of instructors, plane depreciation, and other expenses paid to the Navy, comparing with about \$9,000 for the earlier 300-hour curriculum.



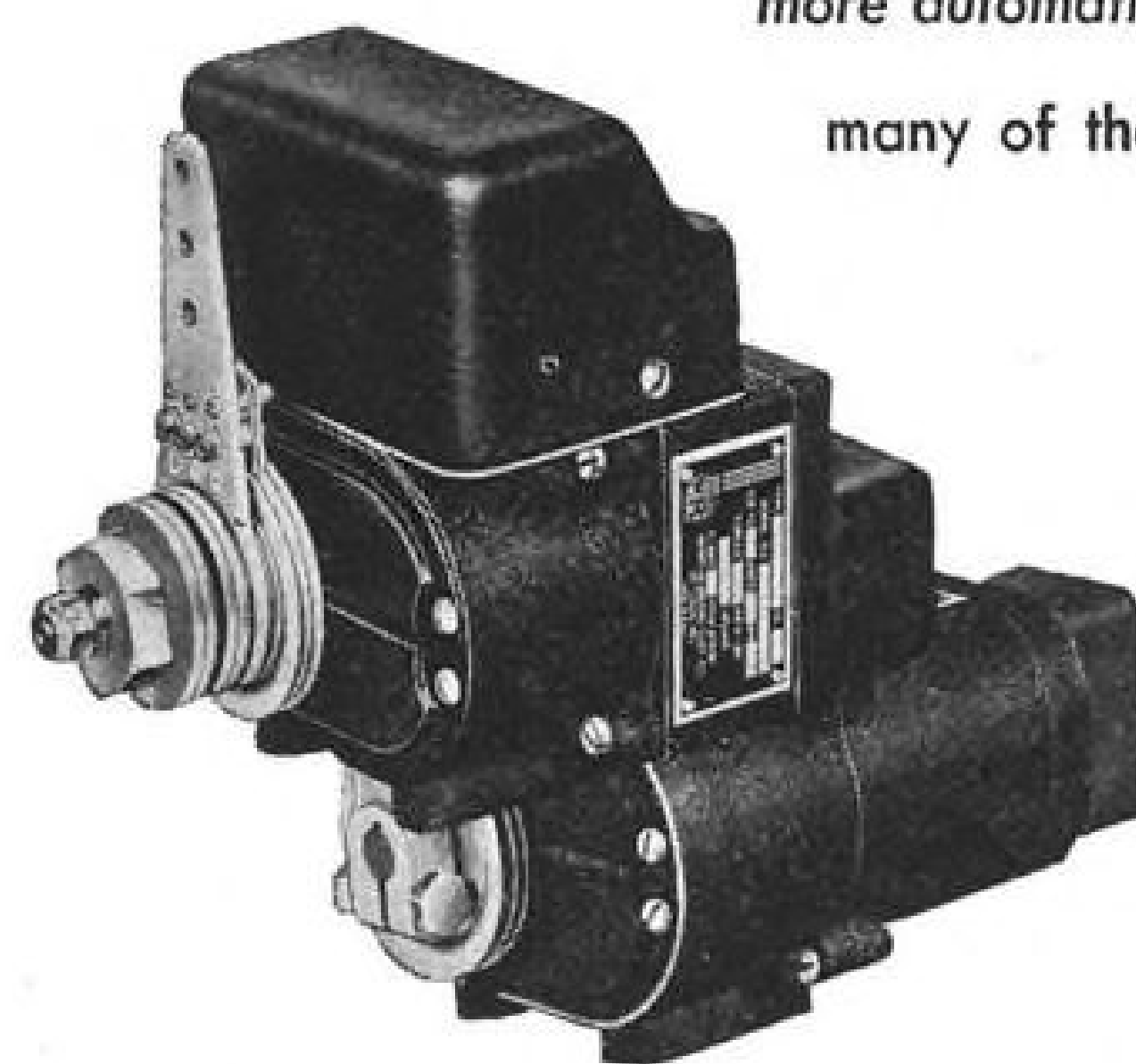
Portable plane heater dries out parachute.

RECONVERSION PREPARATIONS—Many automobile assembly plants will be ready for operation within 60 days after they are given the word to rip out aircraft tooling and assembly lines. The big catch will come in getting the parts, engines and bodies to assemble. But automobile men think that problem can be met if subcontract releases and other details are properly scheduled—a tremendous planning job, equalling conversion to war contracts.



is used for maintaining cabin or cockpit temperatures; or for carburetor or air intake temperatures requiring close control.

Such products, as well as the two White-Rodgers Servo Motors shown here, play their part by making more and still more automatic many of the



complex operations it takes to keep our planes flying.

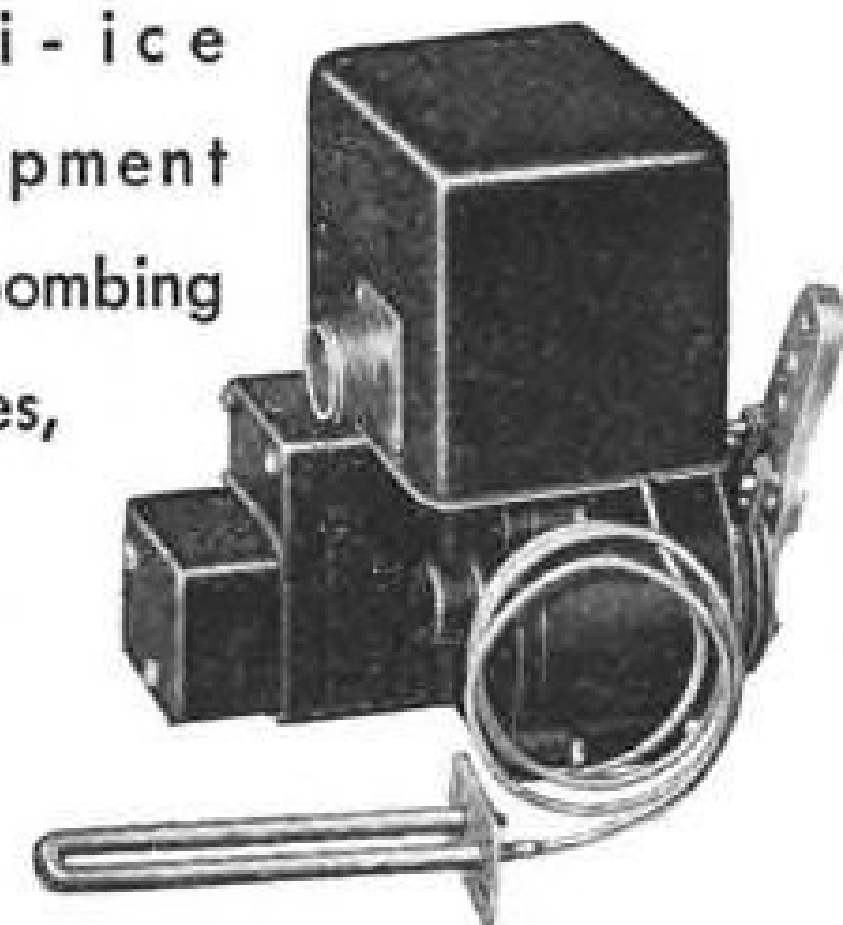
If you are an aircraft manufacturer and need our type of equipment to help build a better plane for our boys, we will gladly supply engineering data and application information.



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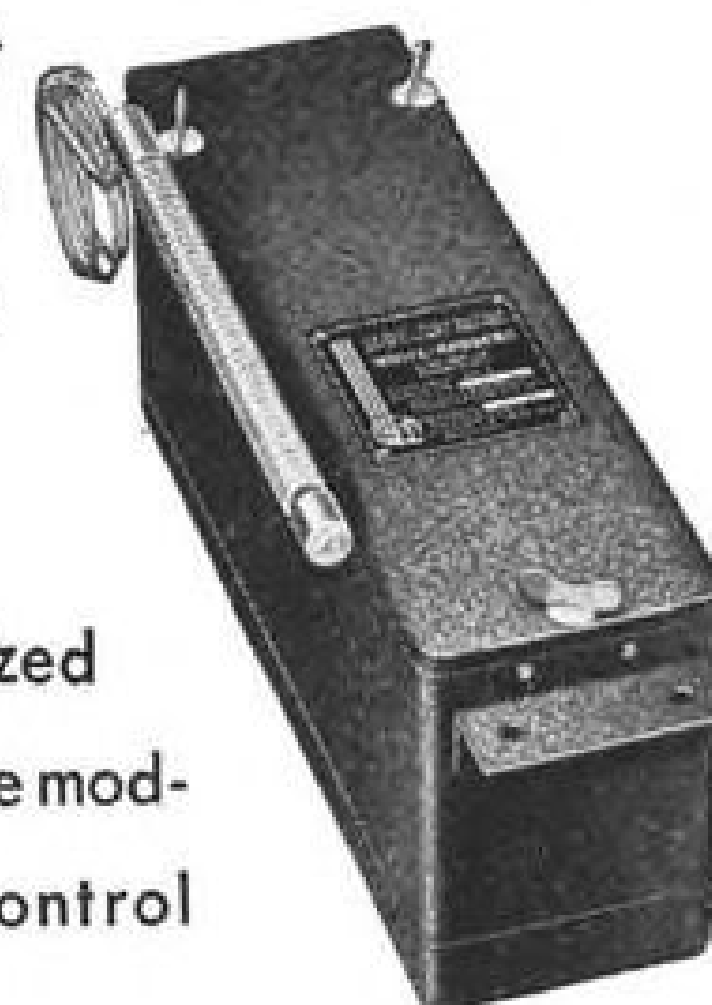
FOR THE MEN WHO FLY AND FIGHT IN PLANES AND FOR THE MEN WHO BUILD THEM

Countless youngsters, managing modern war planes, trust their lives to the skill of millions of factory workers. Our part is to help them with products like this automatic safety control, used on anti-ice equipment for bombing planes,



which may be called upon to function once or a thousand times, yet must always be ready to act.

This motorized temperature modulating control



Mockup of 400-Passenger Plane Shown at Dallas Convair Plant

Projected Model 37, designed as super-transport for post-war production, is mid-wing monoplane of pusher type with six giant air-cooled engines.

By ALEXANDER MCSURELY

Newest claimant for post-war super-transport honors, Consolidated-Vultee's six-engine Model 37, whose capacious double deck fuselage will provide accommodations for 400 passengers, was described to the Aviation Writers Association members last week at the Dallas Convair plant when newsmen viewed a huge full-scale wooden mockup of the projected plane.

Henry Growald, project engineer, described the transport as "the largest plane ever contemplated" but pointed out that the aircraft could be landed on runways of many of our larger present-day airports, due to extremely large landing flaps and braking from reversible pitch propellers. Tom Girdler, Convair chairman, first mentioned existence of the design months ago.

► Giant Air-Cooled Engines—Equipped with giant air-cooled engines of a power not disclosed, the airplane is a mid-wing monoplane of pusher type, and Growald said the wing used is a new NACA airfoil design which makes the most of the additional efficiency, smoothing out the airflow as a result of the pusher design.

Examining the wooden mockup, the newsmen, including two representatives of AVIATION NEWS, climbed a wooden ramp leading into a huge entry hatch in the belly of the plane and explored its two decks.

► Luxury Airliner—Interior of the mockup is not yet finished, but the plane is expected to be fitted luxuriously with passenger accommodations comparable to those in the smaller 50-passenger Model 39 recently announced by Convair (AVIATION NEWS Apr. 10).

Growald said the plane, with a considerably smaller number of passengers, could fly nonstop from New York to London and that one plane could maintain a schedule of three round trips weekly.



WRIGHT BOARDS C-69:

Orville Wright, 73, co-inventor of the airplane, climbs aboard the C-69, Lockheed Constellation, at Wright Field, Dayton, for his second airplane flight in 20 years. During the flight he sat in the co-pilot's seat most of the time and twice took the controls.

► Post-War Project—Although the new transport is definitely a post-war project, some of the component parts expected to be used are already being turned out. Convair shares credit with some 16 major manufacturers and 400 minor companies who have done or will do various research and production jobs in connection with the plane.

The single vertical tail fin was designed to simplify production problems. A tricycle landing gear with a double-wheel in the nose is planned. A "hot-wing" de-icing arrangement which pipes heat out through the leading edge of the wing is another feature.

► Three-Blade Propellers—The six engines will turn three-blade propellers of very large diameter, which will have the reversible pitch feature mentioned above. The original design does not call for a pressurized cabin.

Fabricated principally of a new type alloy, the plane will include considerable quantities of magnesium.

Two Firms Announce Helicopter Models

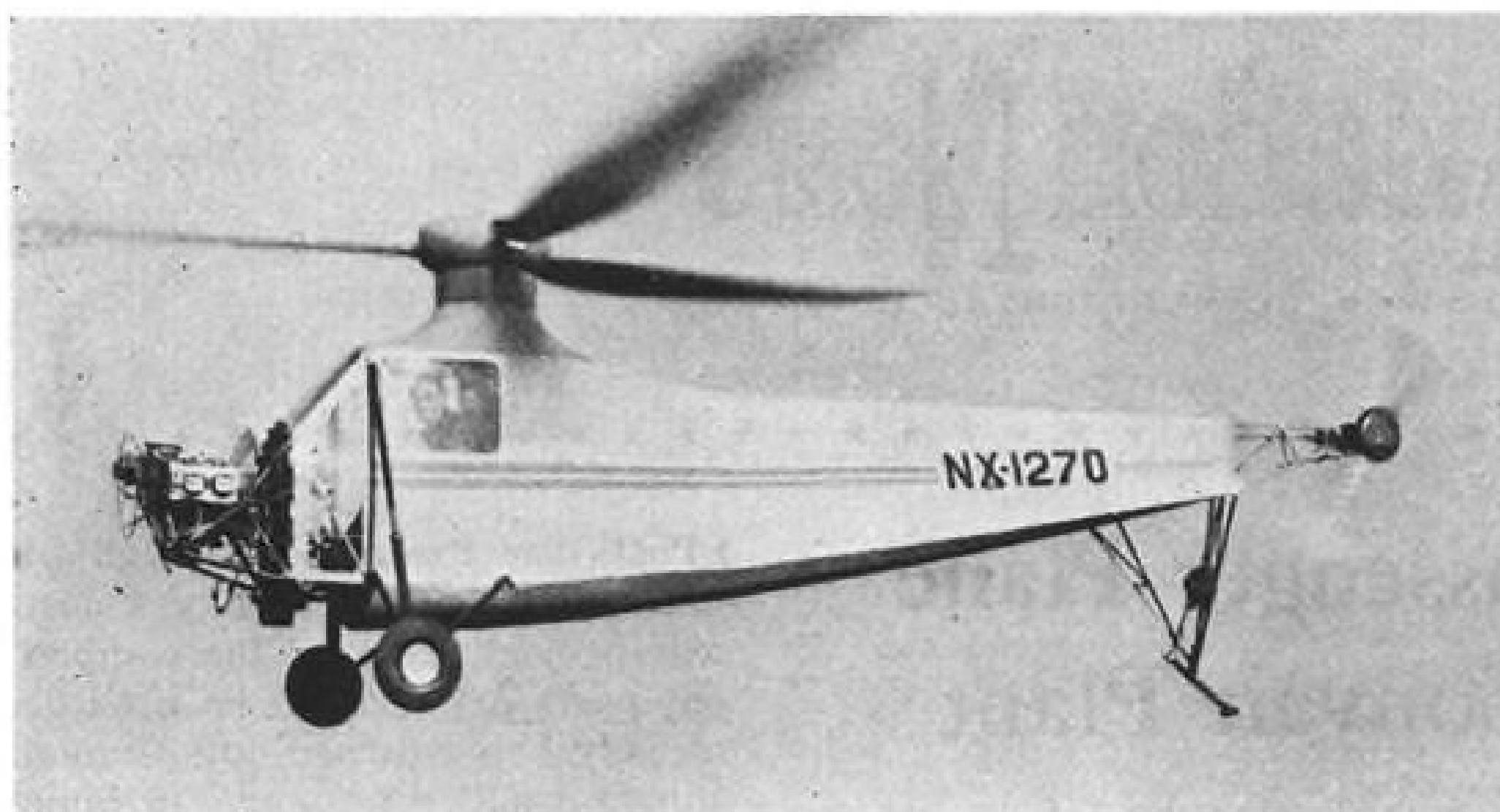
Bell and Aeronautical Products, Inc., release photographs of newly developed rotor craft.

Information on two new helicopters became available last week as cautious engineers continued to emphasize that John Q. Public will not be flying rotary wing aircraft from his back yard for at least another ten years.

Bell Aircraft Corp., pioneer in the domestic jet propulsion project, and Aeronautical Products, Inc., of Detroit and Washington Court House, O., permitted release of photographs of their craft.

► Bell Ship—Principal characteristic of the two-place Bell machine, which has been flying in secrecy for more than a year, appears to be a stabilizing system that makes the rotor independent of the mast so that it tends to stay in a horizontal plane.

Hub design has been simplified



Aeronautical Products' New Helicopter: First photo released by Aeronautical Products, Inc., showing newly developed model on test hop. Craft has been undergoing endurance tests for many months.

by use of a two-blade rotor, whose span is 33 feet, operated by a 160-hp. Franklin horizontally opposed aircooled engine mounted vertically. Conventional anti-torque propeller is on the tail.

► **Complex . . .** Bell spokesmen foresee little use for the helicopter in the private flying field soon after the war. Controls are still too complex for the average private citizen and a high degree of skill and technical knowledge is required. Much research and development will be necessary before mass marketing

of the helicopter is undertaken. Work on the Bell craft began in November, 1941, when Arthur M. Young, who heads the helicopter project, joined the company after working with scale models for more than 12 years.

► **Flies at 100 Mph.**—Aeronautical Products, Inc., meanwhile, is running endurance flights on a craft designed by its president, Alfred Jackson, aided by Frank Dobson.

A 30-foot rotor span and a 115 hp. aircooled engine may result in a cruising speed of almost 100 mph.

New Daily Airframe Record

Airframe weight output per day set new records in April, twice as high as a year ago, and the industry can step up its schedule any time the war demands revisions. Heavy bomber production is "very substantially over the 1,000 mark," which was reached last fall.

It still appears likely that the present rate of 8,000 to 9,000 aircraft a month will not be exceeded, however, although totals will continue to vary downward from the March record of 9,118 planes.

Seventy-seven percent of the 8,343 aircraft delivered to the services in the 25 working days of April were fighters and bombers, another record. This represented 334 planes per working day, only slightly below March, which had 27 working days. Total airframe weight of 96,000,000 pounds was down about 6 percent.

The month's turnout was slightly below schedule.

A press conference by members of the Aircraft Production Board brought out:

Questions by newsmen contrasting the *Constellation* and the

C-54 were referred to General Myers. He said they are "different breeds of cats" serving different purposes. The Douglas, unlike the Lockheed, was built as a cargo transport. The *Constellation* has higher speed and longer range than the Douglas, he said, but the Douglas has other advantages which he did not name.

Chairman Charles Wilson's opinion that the industry is continuing an excellent job although the continuing shift to heavier, longer-range types, with constant improvements, calls for maintaining all-out effort by management and labor.

Some planes, including Boeing *Superfortress* B-29's, were sent to modification lines and were not counted as April deliveries.

B-29 and other four-engine bomber schedules are being met. Request by Board members that certain comment at the conference about the Consolidated B-32 heavy bomber be eliminated from press stories.

Wilson's refusal to comment on jet propulsion planes, except to say that "if there were any made, these figures include them."

AVIATION CALENDAR

- May 8—Meeting of Board of Directors, National Aeronautic Association, Washington.
- May 12. Exceptions to Examiner Wrenn's report on the Memphis-St. Louis-Detroit case due.
- May 15-16—South Dakota Airport Planning Conference, Huron.
- May 17-18—SAE National Diesel-Fuels and Lubricants Meeting, Hotel Knickerbocker, Chicago.
- May 22. Deadline for briefs in the Memphis-St. Louis-Detroit case. (Docket 303 et al.)
- May 23-24—Aeronautical Training Society, annual convention, Roosevelt Hotel, New Orleans.
- June 5-7—SAE National War Materiel Meeting, Book-Cadillae Hotel, Detroit.
- July 10-12—American Association of Airport Executives, Hotel Sherman, Chicago.
- July 18-19—Air Traffic Conference of America, annual meeting, Denver.
- Aug. 2-3—National Business Meeting, National Aeronautic Association, Denver.
- Oct. 5-7—SAE National Aircraft Engineering and Production Meeting, Los Angeles.
- Nov. 15-18—National Clinic of Domestic Aviation Planning, Oklahoma City.
- Dec. 4-6—SAE National Air Cargo Meeting, Chicago.

Eventual public sale is planned.

► **Stress Simplicity**—"Outstanding feature is ease and simplicity of operation," officials said. Although the first model has its engine in front, later ships will utilize a vertical motor within the cabin.

Post-war plans call for substantial production at the Washington Court House plant, said Charles Layman, vice-president sales.

► **Formed in 1935**—Company was incorporated in 1940 but the predecessor partnership had been in existence since 1935 with both Jackson and Layman as executives. About 3,000 employees in the two plants now turn out aircraft precision parts. A leased field near the Detroit plant, six miles from the city, has been licensed as the state's first "helicopter airport." Exhibition flights are planned for the Army Air Show in Detroit June 2-18.

New Device Speeds Engine Changes

Mobile equipment, designed by Southeastern Air Service Inc., has made it possible to change the 220 hp. Continental engine in a PT-17 in 20 to 25 minutes.

The equipment was designed to meet needs at auxiliary fields, Southeastern officials say. At the Bennettsville, S. C., AAF Flying Training Detachment school, similar engines have been changed, using fixed equipment, in a record time of 10 minutes, 25 seconds from the time the old engine was stopped until the new engine was running, it was claimed.

Martin Claims New *Mars* to Have 10c Per Ton-Mile Operating Cost

Air Cargo Research Division set up with view to capturing transportation market for large volumes of high value freight now carried on rails at express rates.

By SCHOLER BANGS

All bets may be off now from the standpoint of experts who have predicted freely that the super-size airliner is impractical, or that moderate size and frequent service will be the post-war trend.

Question, too, the thinking exemplified by the major trans-ocean airline whose officials said a year ago: "We'll never buy another flying boat!"

► **Prophecy**—With a voice of fact-founded prophecy, Glenn L. Martin emphasized in San Francisco a week ago:

► Beyond 120,000 pounds gross weight, the flying boat will carry pay loads progressively greater than the land-based airplane.

► There is no limit to the size to which a flying boat can be built.

► The *Mars* flying boat already shows an operating cost of less than 15-cents per ton-mile.

► New versions, the first to be delivered to the Navy next March, will have an operating cost of 10-cents per ton-mile at 80 per cent cargo capacity.

► A ton-mile operating cost, developed from standard airline formula, of 7-cents is in sight.

Martin's assertions are positive, based on operating cost reports of Naval Air Transport Service, which has been flying the *Mars* between San Francisco and Honolulu, and on design projections of Glenn L. Martin Co. engineers.

► **Based on Weight Distribution**—His "no limit" forecast as to airplane size is predicated on distribution of cargo weight well toward wingtips of the giant cargo carrier to reduce sharply the shearing stresses developed when heavy weights of cargo are located within limited areas extending from the wing's center section.

His estimate of increasing cargo load advantages of the flying boat over the land-based airplane as size increases is made with consideration of the increasing weight of landing gear necessary as land plane size is advanced.

► **Comparative Costs**—As to comparative costs of both types of air-

craft, he says hull costs of the boat and land plane are, for a given gross weight design, "within a few dollars of each other."

While admitting at the aircraft manufacturing meeting in Los Angeles a few days earlier that his company plans post-war production of both land-based and boat types, the 58-year old *Mars* builder indicated he will press development of the large flying boat to be early, if not first, in the field of low-cost cargo carrying to win large volumes of high-value freight now carried on rails at express rates.

► **Research Division Set Up**—To this end, his company has set up an air cargo research division that will suggest to airline operators profitable markets that can be captured with big planes—built by Martin.

Martin sees as the first "big money" market for air transport the hauling of foods—perishable

raw fruits and vegetables; deep-frozen foods now surface expressed to serve seasonal markets 1,000 miles and more from processing centers; and South American stalk-ripened bananas, which East Coast banana syndicate heads believe will create through improved taste and texture a new market.

► **Deep-Frozen Foods**—His consideration of deep-frozen food markets is based on reports that present rail express shipment of such foods cost 16 cents per ton-mile for delivery 1,000 miles; the figure combining the expense of deep-freezing by mechanical refrigeration plus rail express charges.

"We can underbid the transportation of deep-frozen foods by a large margin by eliminating ground freezing; carrying packaged foods to 25,000 feet and 0-degrees Fahrenheit within an hour after they are aboard the plane," he said.

► **Land Planes**—To what extent Martin's prediction of big plane and flying boat trends will influence an aircraft industry committed to development of land-based designs for post-war air transport may not be determined for some time to come. He says, however, that several land plane builders have asked permission to send engineers to the Martin plant to study the *Mars* design and operating figures now available on the giant airliner *Mars*.



ABOARD THE MARS:

Glenn L. Martin (right), head of Glenn L. Martin Co., pilots, as guest of Naval Air Transport Service, his company's giant *Mars* in a flight over San Francisco Bay. It was the veteran plane builder's first trick at the controls of any airplane since 1922, and momentous to him because he flew over the scene of one of his first pioneering exhibition flights, made in 1912. One of twenty aircraft heads and production officials on the flight was Lawrence D. Bell (left), president of Bell Aircraft, shown climbing from the *Mars*' lower deck to flight deck.

Surplus Aircraft Subcommittee Opens Talks on Plane Disposal

Gorrell, president of Air Transport Association, cites need of formulating policy before Army can return any sizable volume of planes to airlines.

The Surplus Aircraft Advisory Subcommittee, headed by L. Welch Pogue, last week began discussions with aviation leaders that will determine its recommendations to the Surplus War Property Board and Administrator Will Clayton.

One of the first spokesmen for various industry groups to meet with the subcommittee was Col. Edgar S. Gorrell, president of the Air Transport Association. The subcommittee also will hear spokesmen for the Aeronautical Chamber of Commerce and aircraft labor groups.

► **Surplus Policy Is Awaited**—It is generally understood that a surplus policy will have to be determined before any volume of additional planes is released by the Army to the airlines. This is borne out by a memorandum sent directors of the ATA by Col. Gorrell Apr. 15, in which he said that "This matter is one that needs to be decided before many additional aircraft can be set aside for our industry."

The Aircraft Surplus Advisory Committee consists of Pogue as chairman, Stokeley W. Morgan, chief of Aviation Division of the State Department; Col. F. Trubee Davison, chief of special projects, AAF; Rear Admiral Lawrence B. Richardson; Assistant Secretary of Commerce William A. M. Burden; Walter E. Joyce, vice-president of the Defense Plant Corp., and Paul T. David, chief fiscal analyst of the Bureau of the Budget.

► **Excess Warplanes Problem**—This committee, probably after disposition of the surplus transport problem, also will tackle the question of surplus war planes. One suggestion that has been made is to send some of the warplane surplus to South American countries with the idea that the air forces of the hemisphere, with the exception of certain now recalcitrant nations, would be equipped and familiar with American planes so that these air forces would fit easily into a hemisphere defense force if that ever becomes necessary. The same suggestion has been made for the disposition of certain Naval units.

The danger of putting such equipment in the hands of governments that may change complexion overnight, however, may operate against such a program, certainly on any extensive scale. It is to the advantage of the American aircraft industry to see that American planes are used in South America, and common plane types would be of great value in case war threatens the southern neighbors.

In this connection, Morgan's experience will be invaluable both for transport and warplane surplus policy in South America, since he had several years' experience as vice-president of the Defense Supplies Corp. in charge of the American Republics Aviation Division. He resigned that post when he joined the State Department, but during his service he supervised the changeover from Axis air lines throughout South America.

► **Limited Inventories Asked**—Despite the vast numbers of war-

planes operating, thousands of them, air experts say, will be worthless except as scrap and the problem in this category may not be as serious as some fear. Probably few planes that have been in combat service can be economically kept, even as reserve units, both because of obsolescence and damage. Many will not be worth shipping costs home.

The Aeronautical Chamber of Commerce, in its Los Angeles declaration, took cognizance of this and urged that the tightest rein be kept on current production to avoid building up of unnecessary inventories and finished planes and spares in reserve. The Chamber suggested that only the most modern surplus military aircraft be stored in reserve.

► **Timing Held Key**—The Chamber termed timing the key to sound disposal, and said that "The sooner surplus planes are made available for commercial purposes, the more completely will desirable objectives be reached. The immediate use commercially of surplus equipment before new improved models are generally available will aid in creating demand for improved equipment."

C-47's Likely to Spearhead Invasion

Many of the more than 3,000 modified DC-3's and C-47's built since the outbreak of war will spearhead the invasion of Europe as units of the Troop Carrier Command, which, the OWI recently revealed, now consists of tens of thousands of parachutists, glider-borne forces and technical personnel.

The TCC today is larger than the entire air force three years ago and is charged with the delivery and supply of airborne forces in all theaters of war. The role in Europe, if hints coming from England are borne out, will be greater than any yet conceived in modern warfare.

► **Flies Paratroopers**—In operation, the TCC flies the paratroopers who seize fields suitable for landing of the planes and gliders. Basic tactical unit of the Carrier Command is a squadron, comprising enough Douglas transports to carry a platoon of infantry, fully equipped with supplies and three jeeps. After delivery of troops, the planes fly back wounded and supply the fighting forces.

Industry Leaders Pictured in Los Angeles



Leading Aircraft Manufacturers. Shown at the Los Angeles meeting are, left to right: (Seated) J. H. Kindelberger, president of North American; P. G. Johnson, Boeing president; L. C. Goad, GM vice-president and general manager of Eastern Aircraft Division; Harry Woodhead, Consolidated Vultee president; LaMotte T. Cohu, chairman of Northrop; Guy W. Vaughan, Curtiss-Wright president. (Standing) Alfred Marchev, president of Republic; J. Carlton Ward Jr., Fairchild president; Glenn L. Martin, president of the Martin company; T. Claude Ryan, Ryan Aeronautical president; Lawrence D. Bell, president of Bell Aircraft; Robert S. Gross, Lockheed president; Eugene E. Wilson, vice chairman of United Aircraft Corp. and new chairman of the Aero Chamber; Ernest R. Breech, Bendix president, and Reginald E. Gillmor, Sperry Gyroscope president.



Donald Douglas, board executive and member of the policy-making executive committee, talks things over with George Pfeil, publisher of AVIATION NEWS, Aviation and Air Transport.



Alfred Marchev, T. Claude Ryan, J. H. Kindelberger and P. G. Johnson caught in an impromptu conference.



Reveals Mars Data: Right: Glenn L. Martin, builder of the giant Mars, tells reporters of the plane's performance in operation between San Francisco and Hawaii. He said his company would build, on order, a 320,000-pound gross weight flying boat when war production eases. New model Mars will take off at 155,000 pounds gross.



Left to right are members of the Chamber executive committee: Donald Douglas, board vice chairman; E. E. Wilson, E. R. Breech, Glenn L. Martin, P. G. Johnson.



James P. Murray, right, was elected president of the ACCA. The job of the vice president of Boeing Aircraft Co. will be administration of the Chamber's policies. He is shown here talking with Board Chairman Eugene Wilson.

Legal Problems Hold up Disposal Of Excess Plane Plant Inventories

Surplus materials held by aircraft manufacturers to be segregated and stored under program, with title to be transferred to the government.

Legal problems have delayed final decision on policies for the disposal of excess inventories now held by aircraft manufacturers.

The aircraft plan calls for segregation and warehousing of the materials with title being transferred to the government.

Two days of conferences were held last week to work out final details of the basic plan, which has been approved by contracting agencies, after which ironing out of legal problems was left to a smaller group.

► **June 1 Deadline** — Industry sources said they were hopeful that the plans would be completed before June 1, when it is possible that physical segregation and assessing of the surplus materials may be completed. However, it is possible that all companies will not have their reports until July 1 because of the extent of the task. No estimates are available as yet, but it has been authoritatively estimated that it will top \$100,000,000 for the nation's aircraft plants. In some cases, excess inventories exceed the total capitalization of the companies.

Meanwhile, W. L. Clayton, Surplus War Property administrator, made public his agency's first policy announcement, dealing with prices for surplus property left over from termination of war contracts. This policy would apply after contract cancellations and does not apply to property declared surplus by procuring or owning agencies of the government, which will be handed over to disposal agencies and handled under regulations to be announced later.

► **Transfer Title to U. S.** — The aircraft plant is designed to transfer title to the government before contract terminations, thus clearing the way for quick conversion in an industry already handicapped by low capitalizations.

Clayton emphasized that his policy pronouncement covers materials that in some cases are the property of the contractor, and in other instances the property of the government. In all cases, it is

property still on the premises of the contractor and not moved into government storage.

The Clayton policy announcement said materials of any type may be sold at the best price obtainable when the claim against the government is less than \$10,000. The contracting officer, however, must make a reasonable test of the existing market as a basis for a price decision.

► **Market Price** — Raw materials are to be sold at the going market price, and if not, turned over to government disposal agencies — RFC, Treasury Procurement Division, War Food Administration or the Maritime Commission.

Usable property other than raw materials may be sold to any buyer at the best price obtainable in excess of 75 percent of either cost or "the price which that buyer would have to pay if he bought an equivalent quantity from a normal source of supply, whichever is lower." If sale cannot be made on this basis within a reasonable time, property may be sold at the best price obtainable to a "buyer who will consume it in the United States for manufacture or maintenance or repair purposes, and who will agree if he does not consume it not to resell it at a profit."

► **Scrap** — Semi-finished material that can be sold only as scrap is made the responsibility of the procuring agency, and where the amount of property to be scrapped exceeds \$50,000, final determination to scrap will be subject to local, regional or departmental boards of review, "or another officer appointed by the procuring agency." Sales must be at going prices, or if such prices cannot be obtained, by bid, with the right reserved to reject all bids if the price is too low.

RAF's New Spitfire Gets Into Action

Disclosure that a new Spitfire fighter plane has gone into action has been made in London, a plane to which outstanding performance at low altitudes has been added to the fighting qualities which have kept the Spitfire in the forefront of the air battles of the war.

Changes from previous models include clipped wings and a heavier and more powerful engine, the Rolls-Royce Griffon, giving improved maneuverability, greater speed and rate of climb.

► **Low Altitude Performance** — The British Information Services reported that it was realized even prior to the Battle of Britain that performance at low altitudes might well become a deciding factor of the air war. To supplement the high altitude fighters being built, Supermarine began the design of an improved single-seater fighter to be powered by the Rolls-Royce Griffon. These two firms cooperated in the work and in 1942 the first production machine was available.

In the meantime, acute design problems had to be solved. These included the substantially increased size and weight of the new engine in comparison with the Merlin, which necessitated modifications of sections of the aircraft, a new fuselage reinforced and strengthened to support the heavier engine, and a new type of engine mounting.

► **Design Changes** — The prototype, first flown in 1941, was fitted with standard type Spitfire wings. It was evident that further changes were necessary and clipped wings were substituted, and an improved rudder added to give maximum maneuverability.

Air War Techniques Described by King

Admiral traces progress of aircraft and anti-aircraft defenses during last ten years.

Development of aircraft and anti-aircraft techniques over a period of ten years prior to the war has been traced in a report of the Navy's war role by Admiral Ernest J. King, commander-in-chief, U. S. Fleet, to the late Secretary of the Navy Knox.

Although war experience has implemented the anti-aircraft techniques used by the fleet, King's report is interesting in its tracing of the building up of aircraft strength and recognition in the early thirties of the role that anti-aircraft equipment would play in naval warfare.

► **Carriers Effective** — King pointed out the one benefit — backhanded yet potent — derived from the Washington Arms Conference was the conversion of two battle cruisers into the carriers *Lexington* and *Saratoga*. Instead of obsolescent battle cruisers, King said, the carriers were effective fleet units at the outbreak of war. The *Lexington* was sunk at Midway, the *Saratoga* is still in action.

"The United States Navy has made its aviation the standard by which all other naval aviation is judged," King said.

In 1933, he brought out, the *Farragut* class destroyers, first to be equipped with the deadly five-inch and 38 caliber dual purpose guns, were started and the *Farragut* type of armament was then built into cruisers and battleships. Recent testimony before the House Naval Affairs Committee revealed that this type ammunition constitutes the most rapidly expended class used.

► **New Type Battleships** — The *North Carolina* class battleships were built with the requirements of air warfare taken into consideration, with increased armor protection against bombs, heavy fragment protection, *Farragut*-type anti-aircraft weapons, good torpedo protection and excellent speed and steering qualities for rapid maneuvering. Although King does not bring it out, these battleships also were designed to operate in task forces with carriers, able to maintain carrier speeds and to offer heavy anti-aircraft protection for the carriers.

The 6,000-ton *Atlanta* class anti-



JAP AIRFIELD DEFENSE IN BURMA:

Photo shows how the Japanese sought to prevent landing of glider-borne invasion forces in Burma by cutting trees from the nearby forests and dragging them out onto the potential landing area. This area, designated as "Piccadilly," was one of two areas selected, and landings — some rough ones — were made at "Broadway" the alternate site. Shown in the accompanying photo are glider troops grouped around their aircraft which was damaged in landing.



aircraft cruisers were designed in 1937 and fit into the task force picture with the fast battlewagons, carriers, heavy cruisers and destroyers. Other highlights of King's speech:

► Fifty carriers of all types were in service by the end of 1943.

► In the fall of 1942, only three fleet carriers were in service — the *Saratoga*, the *Enterprise* and the *Ranger*.

► A large proportion of the *Essex* class carriers have joined the fleet. (Originally eleven of this type carrier were scheduled.)

► Nearly all carriers of the *Independence* class (converted light cruisers) have been completed.

These ships are used as first line carriers, although their plane complement is much less than that of the *Essex* carriers.

► A third type of fleet carrier will displace 45,000 tons, with far heavier armament and much greater bomb and torpedo protection.

► New Navy version of the *Liberator*, with more powerful defensive armament and greater offensive strength, soon will be available.

► *Corsair* and the *Hellcat* are superior to anything the Japanese have.

► Damage in the South Pacific air battles between carrier forces was far greater than admitted at the time because of security demands.

Woodrum Group Studies Army's Argument for Unified Air Force

Vice Admiral McCain to be one of principal witnesses appearing for Navy this week, when hearings are to be resumed.

By WILLIAM G. KEY

The Woodrum Committee on Post-War Military Policy last week was digesting Army recommendations for a single department for the armed services and the first of Navy testimony asking that any decision be delayed until the commitments of this country can be better determined, and until the lessons of the war can be better assimilated.

Acting Secretary of the Navy Forrestal appeared before the committee after it had heard Army witnesses, including Secretary of War Stimson, urge action before the end of the war, with final amalgamation of the forces taking place within six months after the war.

► **Field Commanders** — Forrestal asserted that the committee should hear field commanders before recommending any steps, and particularly emphasized the air aspects of the problem. The case for a single air force remains to be proved, he said.

Observers suggested that the Army had gone too far in its presentation of views, and pointed out that the Woodrum committee—which is not a legislative committee, but will report its recommendations to the House and to the Military and Naval Affairs Committees—had expressed a basic policy of not advocating changes until the commitments of

this country and the relationship of world powers could be determined following the close of the war.

The net result is that the deliberations of the committee have been thrown into bickering over detail, although the convictions of the committee generally were in favor of a single department for the armed services. Pressing for immediate recommendations, advocating reorganization of the governmental structure to greatly strengthen the hand of the professional military men, and demanding that only the broad principles of reorganization be set down with fundamental detail left to the new organization to work out as it desired, the Army more or less left the committee members and the Navy inclined to examine the matter in great detail.

► **Unified Services**—It is known that Navy studies have leaned in the general direction of unified services, but it is only too patently obvious that the Army planners have gone far beyond anything that would meet with Navy approval under present circumstances, and probably far beyond anything that the Congress would sanction.

Vice Admiral McCain, deputy chief of naval operations for air, will be one of the principal witnesses appearing for the Navy this

Russian Talks

State Department last week awaited the arrival of a Russian delegation for talks on post-war aviation with Joseph C. Grew, former ambassador to Japan and now chief of the Department's Far Eastern division, Chairman L. Welch Pogue of Civil Aeronautics Board, and William A. M. Burden, Assistant Secretary of Commerce.

Department spokesmen said the Russians accepted the invitation to confer some weeks ago and have been expected in Washington momentarily. There was no indication that the talks will not take place.

China has agreed to participate in similar discussions, but thus far the Russian talks are the only ones scheduled.

week when the committee resumes its public hearings. Others who will testify are Ralph Bard, assistant Secretary of the Navy, who will discuss civilian manpower problems; Vice Admiral Horne, demobilization and post-war plans; Vice Admiral Jacobs, problems of naval manpower; and Lieut. Gen. Vandegrift of the Marine Corps.

► **McCain to Present Navy's Case**—Admiral McCain will present the case for Navy air, which under the Army reorganization plan would consist only of planes operated from seaborne units—carriers, cruisers and battleships. All land-based operations would come under the suggested Air Force. The Navy consistently has maintained that pilots operating with the Navy should be Navy-trained pilots completely familiar with naval operations.

The Navy maintains that it is not enough that the carrier pilots be Naval aviators, but that search pilots, long-range bomber pilots and special pilots should be qualified in naval operations. In other words, pilots and aircrews should be familiar with such things as ship recognition, fleet dispositions and naval tactics, surface vessel characteristics and potentialities.

► **Exception**—The Army maintained in its testimony that Army, Navy and Marine Corps pilots have been functioning as a unified force in the South Pacific, yet the fact remains that the majority of naval strikes have had to be carried out by Navy and Marine pilots. The only great exception

was the destruction of a Jap convoy in the Bismarck Sea, carried out by Kenney's Southwest Pacific Army flyers, in which all surface vessels in action were Japanese.

The old question of strategic and tactical air groups appears to be the nub of the argument. Even committee members opposed to the Army views concede that strategic air operations should be conducted by one air arm, but they maintain, and the Navy maintains, that tactical forces must operate with their basic service, land or sea, to meet adequately the defense needs of the country. And in operations as widespread as those in the Pacific, strategy and tactics are many times closely intertwined.

Boeing Acquires DPC-Built Plant

\$7,101,819 reported paid for No. 2 unit at Seattle; constructed by government in 1940.

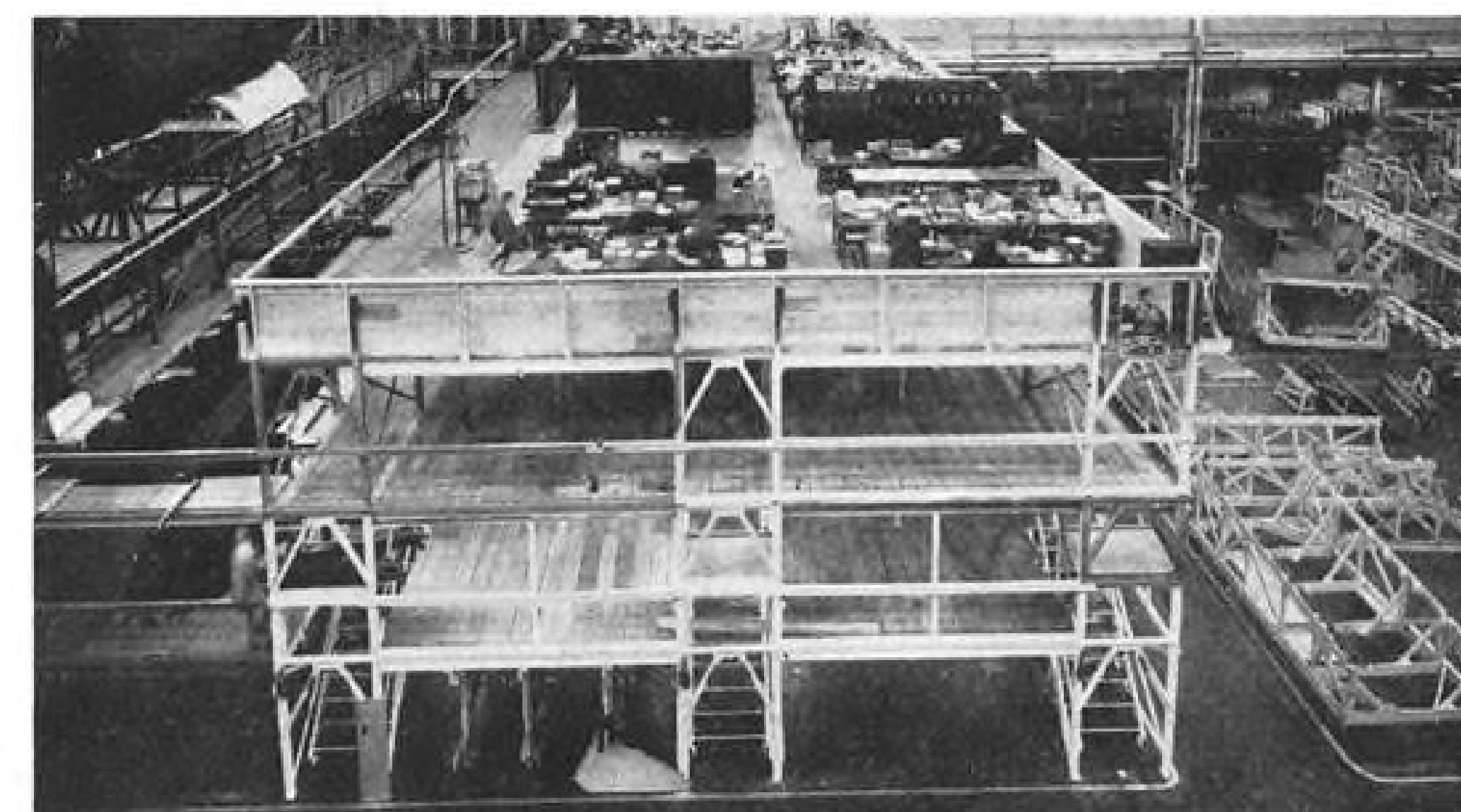
Boeing has completed purchase of its Plant No. 2 in Seattle from the Defense Plant Corp. and now owns its entire Seattle manufacturing unit with the exception of a few temporary buildings, one permanent building and "certain equipment."

The No. 2 unit is the production plant, and was built in 1940 by the government. The cost to Boeing was \$7,101,819, the annual report of P. G. Johnson, president of the company, reveals.

► **At Seattle Airport**—Prior to the war-dictated building of the new plant, Boeing manufacturing was housed in Plant No. 1, now entirely devoted to engineering and research work. Plant No. 2 is at the Seattle municipal airport, Boeing Field, and is three miles from the original plant.

Gross sales of the company for 1943 rose from \$386,567,316 in 1942 to \$493,188,161. Net profits, however, dropped from \$5,237,624 in 1942 to \$4,482,870 in 1943. The net profit amounted to 91/100 of 1 percent of the gross sales, as against 1.34 percent for 1942.

► **Reserve Set Up**—A reserve of \$2,000,000 for contract adjustments and expenses in connection with terminations was set up, following a policy started in 1942, while the 10 percent post-war refund of excess profit taxes was transferred to a reserve for development of post-war products and markets throughout the world.



MARTIN CREATES EMERGENCY OFFICE SPACE:

PBM-3 Mariner hull fixtures no longer needed at the Glenn L. Martin plant in Baltimore have been floored over to provide badly needed office space for timekeepers, industrial engineers, personnel counselors and clerical workers who were occupying areas now being used for production work. By making four floors where only one existed before, 22,464 square feet have been added to the Martin working area to be used in production of the Mars.

Johnson recapitulated production records already revealed (AVIATION NEWS, Apr. 17) and said "future planning for the company is being conducted by the engineering department and by an independent research agency . . . the management recognizes that problems of even greater magnitude than those encountered during the war will be presented when peace comes, which may necessitate the manufacturing and marketing of other products in addition to aircraft."

► **Advertising Continued**—"A conservative, national campaign of institutional advertising has been continued, to acquaint the public with the accomplishments of the company, its exceptional record in the development and production of aircraft and its abilities applicable to future products."

3,000th Corsair

The 3,000th F4U-1 Corsair fighter has rolled off the assembly lines for Chance Vought Aircraft Division of United Aircraft Corp. at Stratford, Conn., the company announced last week.

Corsairs also are being built by Goodyear and Brewster.

The gull-winged fighters are going to the U. S. Navy, the Marine Corps and the Royal Navy.

H. L. Dunn Elected To Lockheed Board

Harry L. Dunn, Los Angeles attorney and a Lockheed counsel for many years, last week was elected a director of Lockheed Aircraft Corp. All directors won unanimous re-election at the annual stockholders meeting in Burbank.

Dunn fills a board vacancy created a year ago when Frank Russell, of New York City, resigned to give full attention to the position of general manager of the National Aircraft War Production Council. Dunn played a prominent role in Lockheed's purchase of Pacific Finance Corp. and the later merger of Lockheed and Vega.

► **Directors**—Re-elected directors are: Robert E. Gross, president; C. A. Barker, Jr., vice-president and treasurer; Courtlandt S. Gross, vice-president and general manager; Carl B. Squier, Cyril Chappell and Hall Hibbard, vice-presidents; Randolph C. Walker, president of Aircraft Accessories Corp., and G. Brashers, president of G. Brashers and Co.

Company officers re-elected unanimously by the board, other than officers serving on the board, include Mac Short and H. E. Ryker, vice-presidents; L. W. Wulfe-kuhler, secretary; H. R. Campbell, Ronald P. King, assistant treasurers, D. E. Browne, comptroller.



MARINER LANDS IN DRY LAKE:

For the second time recently a Martin Mariner boat landed on sand without serious damage. Making a cross-country hop to the Pacific, this PBM landed on the bed of a dry lake in the Arizona wastelands when a motor failed. The plane was dismantled and shipped out.

Sees Further Rise In Small Motors

WPB Group forecasts sharp increase in fractional horsepower types by mid-1945; summary of week in U.S. and war agencies.

By MARY PAULINE PERRY

A 25 percent production increase in large aircraft motors and a 17 percent increase in small aircraft motors are expected by the middle of 1945, a recent meeting of the WPB Fractional Horse Power Electric Motor Industry Advisory Committee estimated. Of the total demand for small motors, 70 percent will be for aircraft while 30 percent will be for radio and radar.

According to data presented at the meeting, other requirements for 1945 are 15,000 to 20,000 motors a quarter for ASO replacements, 9,000 to 10,000 aircraft inverters for both Army and Navy, and amplidynes and Selsens at approximately the same rate as at present.

Plans for eventual reconversion of the automobile industry to civilian production can not be formulated effectively without parallel discussions with the aircraft industry, the WPB Automobile Labor Advisory Committee decided at a meeting in Washington. Charles E. Wilson told them that after the defeat of Germany 35 percent of the automobile productive capacity now tied up with war work will be available for peacetime production.

Wage incentive plans are accounting for an average increase in productive performance of 25 to 40 percent in regions where they have been adopted, WPB stated.

► **Aircraft Resources Control Office**, War and Navy Departments and other related government departments are represented on the newly established "modified area production urgency committees" located where War Manpower Commission has established a manpower priorities committee, but a full-fledged area production urgency has not been established. Any WPB regional director may organize such a committee, whereas the regular urgency committees are established upon direct authority from the WPB Production Executive Committee in Washington.

Although the Aluminum and Magnesium Division has announced a cut-back in virgin aluminum metal, production of other aluminum products, such as sheet, extrusions, castings and forgings, is not in excess of consumption, and sheet producers are having difficulty meeting schedules, due to manpower shortages, WPB said.

► **Operating Committee on Aircraft Materials Conservation** has issued a bulletin on the use of crude rubber and synthetic rubber elastic shock and exerciser cord in aircraft applications since such applications are using an appreciable volume of crude rubber. A preliminary report has indicated that elastic shock and exerciser cord made of GR-S (Buna-S) synthetic rubber probably will be suitable in many instances.

► **National War Labor Board** ruled, in denying an appeal by Douglas Aircraft Co. from an order of the Tenth Regional Board, that the Board cannot accept a petition for review of a regional board order when the petition is based solely on a dispute as to the regional board's finding of fact. Industry members dissented. The Regional Board, acting upon a ruling of the West Coast Aircraft Committee, had directed the company to reclassify one of its employees into a higher rated job. The employee is a member of the United Aircraft Welders of America, an independent union.

► **NWLB** upheld an order of the Second Regional War Labor Board in New York directing a paid lunch period under a new shift schedule where the employer had voluntarily paid the workers for their lunch period under the old schedule is not in conflict with the wage stabilization program. The case in question involves approximately 2,500 employees in the Farmingdale plant of Ranger Aircraft division of Fairchild Airplane Corp., who are represented by UAW-CIO.

The dispute was caused by a change in the shift schedule at the plant. The workers were put on two shifts of ten hours each, whereas they previously were on three shifts of eight hours including a half hour for lunch. The Board based its order on the fact that the company had given eight hours' pay for seven and one half hours' work and the employees should not be required to work two and one half hours more per day for only two hours more pay.

► **Petroleum Administrator for War** Harold Ickes for the first time announced that the United Nations are producing 400,000 barrels of 100 octane aviation gasoline a day, enough to send 10,000 planes every 24 hours.

► **War Contracts Price Adjustment Board** has simplified the mandatory filing requirements for certain war contractors and subcontractors, subject to the Renegotiation Statute, by ruling that parent and subsidiary companies may satisfy the requirements for filing a mandatory form of report by doing so on a consolidated basis. Subsidiaries must file the Standard Form of Contractor's Report, but may complete the report simply by writing on it a statement that the information called for is contained in the consolidated report filed by the parent company.

► **National Labor Relations Board** certified UAW-CIO for the majority of employees at Waco Aircraft Co., Troy, Ohio. All inspectors at Consolidated Vultee Aircraft Corp., Fort Worth division, were certified IAM-AFL. At Douglas Aircraft Co., Inc., all employees in the electrical maintenance and electrical construction departments were certified International Brotherhood of Electrical Workers-AFL.

Army-Navy "E" awards have been presented to Republic Aviation Corp., Indiana division, Evansville, Ind., and Nice Ball Bearing Co., plant 1, Philadelphia.

The Army Chief of Engineers has let contract for improvement of Army Air Force bases and installations in the amount of approximately \$2,204,000. Among the contracts was one for \$133,356.30 for construction and erection of structural steel work for hangar at Marietta Aircraft Assembly Plant, Ga.

Futures Trading

Pan American Airways, in a "hypothetical" time table dated July 15, 1948, told of fares and schedules to distant points that brought a response beyond expectations. In consequence, it has had to send apologetic notes to prospective travelers and return their money.

A PAA representative said about 5,000 of the folders were distributed, but "we're not printing any more." Many inquiries were received, and several sent checks for reservations on first flights.

They were sent back with word that PAA didn't know just when planes would be available, but would keep the applicant's name on file. Attention was called to a line in fine print at the bottom of the table that "the data herein contained are purely hypothetical."

In addition to "condensed flight schedules" and "representative fares," a special 3-day week end air cruise to Paris from New York was suggested, complete with helicopter transfer in both cities.

Fare to Paris was set at \$112.50 one way, \$202.50 round trip. The schedule listed five Paris express flights daily of 15 hours in flight, and two locals of 17 hours 50 minutes. Among 21 other points listed were London, Berlin, Rio De Janeiro, Moscow, Honolulu, Tokio, Bombay, Sydney, Singapore and Hong Kong.

Aeronca to Retool For C-46 Contract

Contract for the Noorduyt UC-62 *Norseman* cargo plane held by Aeronca Aircraft Corp., Middletown, Ohio, has been canceled and company will retool for subcontract work on the Curtiss C-46 *Commando*. Work at Aeronca will consist largely of C-46 tail surfaces to be supplied the Curtiss-Wright plant at Buffalo and the Higgins plant in New Orleans, both of which are building the large twin-engine cargo plane.

► **Second Cancellation** — Rapidly-changing conditions led to this second contract cancellation of the year for Aeronca. Contract for the PT-19 was canceled in February and retooling for the UC-62 project was started. This work has now been stopped and retooling for the *Commando* work will start as soon as arrangements can be completed.

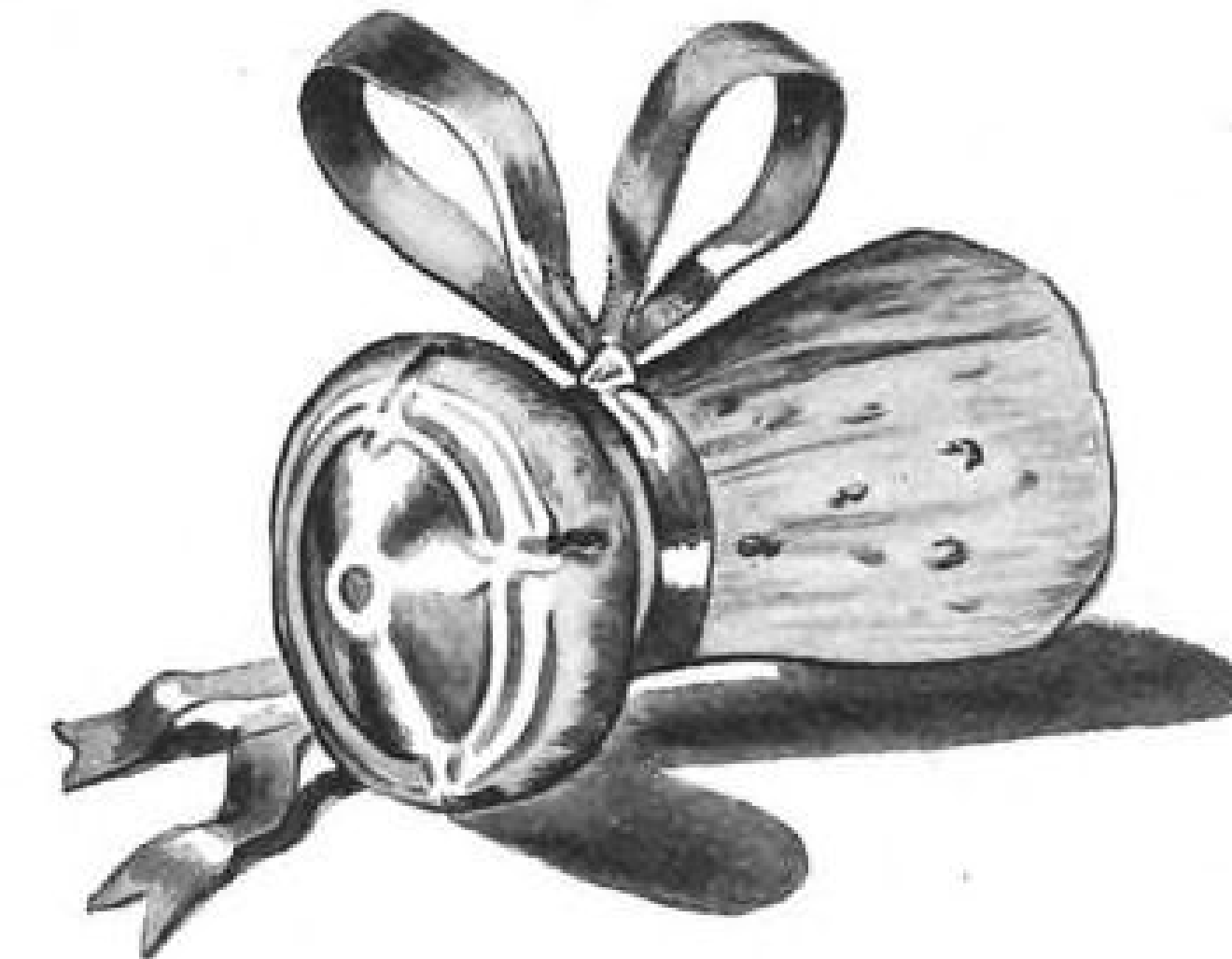
Capt. Charles O'Neil, AAF representative at Aeronca, said the change was made because "overall conditions are changing so fast."



They wouldn't fly without them...



A battered toy monkey goes along on every flight of one aerial gunner who, when we last heard from him, had personally cancelled five Zeros.



A champagne cork—memento of some very special evening—always hangs on the instrument panel of a sentimental co-pilot. It's helped to "pop" several Jerrys.



A black Homburg hat, instead of a regulation helmet, always adorns the head of one of the hottest RAF fighter pilots in the business.



ETHYL is a trade mark name

Ethyl antiknock fluid goes along with every fighting plane powered by U. S. made gasoline. *It goes into every gallon of fighting grade aviation fuel*—and today more Ethyl is being used in each gallon than ever before.

ETHYL CORPORATION

Chrysler Building, New York City

Quarantine Revision Put Off Two Years

Pan American Conference of Health Directors delays action till Caracas meeting in 1946.

Hope for early modernization of aerial quarantine regulations in the Western Hemisphere was dashed in Washington last week when the Fifth Pan American Conference of National Directors of Health put off until 1946 revision of the International Aerial Navigation Sanitary Convention of 1933.

The conference, which meets every four years under Pan American Union auspices, alternates with the Pan American Sanitary Conference, which also meets at four-year intervals and is to meet next at Caracas, Venezuela, late in 1946.

► **UNRRA Enters Picture** — The day before discussion of proposed revision of the Pan American quarantine regulations was to come up at last week's meeting, the United Nations Relief and Rehabilitation Administration was injected into the picture with circulation of proposed revisions of the 1933 Convention. They identified UNRRA as coordinating agency for the quarantine code and delineator of so-called yellow fever zones, and implied it was synonymous with the International Office of Public Sanitation.

The document caused a sensation. Dr. Joao de Barros Barreto, National Director of Health of Brazil, told the conference it was his understanding that UNRRA was organized to administer occupied territories. So far as he knew, he said, none of the countries of the Western Hemisphere has been occupied.

► **Report to Be Submitted in 1946** — Dr. G. L. Dunnahoo, chief of the United States Quarantine Division, declared after two hours of discussion by the delegates that the proposal came from UNRRA's London office, was not the product of the Conference's Quarantine Committee, and could be torn up if desired.

Efforts were made to obtain passage of some sort of quarantine unification, but the Conference finally approved a resolution by Dr. Jules Thebaud, National Director of Health of Haiti, calling for a permanent commission to submit a final report to the Caracas conference two years hence.

► **17 Changes Recommended** — The

commission will study a preliminary report by the Quarantine Committee, describing preparation of a modification draft by the UNRRA council. Seventeen changes in quarantine regulations were recommended and will be covered in the commission's study.

They involve questions of expenditures for hospital facilities, adoption for international air travelers of a standard form of sanitary passport, responsibility for safety measures at airports, possibilities of minimum uniform physical examinations, and examination of immigrants at points of departure.

► **Protection Against Epidemics** — In the meantime, as one delegate pointed out, each of the 21 American Republics will make its own quarantine rules. The possibility of an early end of the war, he said, and ensuing mass migration by air, imposes on each the duty to protect itself against epidemics, such as typhus, which might be brought in from Europe.

Two More Airlines To Stop at Topeka

Service by two additional airlines was given to Topeka, Kan., in a Civil Aeronautics Board decision, making a total of three air carriers serving a city of 73,764 population.

The decision authorized Braniff to include Topeka as an intermediate point on AM 9 between Kansas City and Wichita. It also permitted TWA to use Topeka as an intermediate point between Wichita and Kansas City on its transcontinental AM 2.

► **Includes Hutchinson** — Continental, which serves Topeka on AM 60, was authorized to include Hutchinson, Kan., as intermediate point between Denver and Salina, Kan., on that route.

TWA was not permitted to serve Salina and Hutchinson as it had asked. Hutchinson is now receiving service on Continental's AM 43. ► **Links Routes 60 and 43** — Granting of Continental's requested stop provides a connection between its Routes 60 and 43 at Hutchinson, and is expected to improve service between points on those routes.

In discussing Topeka, the Board found that where a city of importance is on or nearly on the existing route of an air carrier, sound transportation principles would indicate that service should be au-

thorized "where such service can be provided without cost to the carrier, without financial burden to the government, without detriment to the carrier's existing service, and without undue impairment to service of any other carrier."

► **Greyhound Overruled** — The Board overruled a memorandum by the Greyhound Corp. suggesting that the decision be temporary until a policy is established for local-feeder-pickup operations.

Ask CAB Ruling on Ryan, Braniff Cases

Two corporate relationships referred to Board for approval.

Two corporate relationships referred to CAB for approval cover ownership of Ryan School of Aeronautics by Ryan Aeronautical Corp., and transfer of the stock of Aerovias Braniff S. A. from T. E. Braniff to Braniff Airways.

► **Applications** — Ryan School has applications for two overseas air routes and a California feeder line system already on file. Ryan Aeronautical Corp. manufactures Naval aircraft and aircraft parts.

The application seeks approval of this relationship, and says the planes to be used in the operation of the projected airline will not be manufactured by Ryan.

► **Braniff Stock Acquisition** — In two other applications, the Board is asked to approve the acquisition of a majority of the stock of Aerovias Braniff S. A. by Braniff Airways. The stock in question is now owned by T. E. Braniff, who also owns 34.12 percent of the outstanding stock of Braniff Airways.

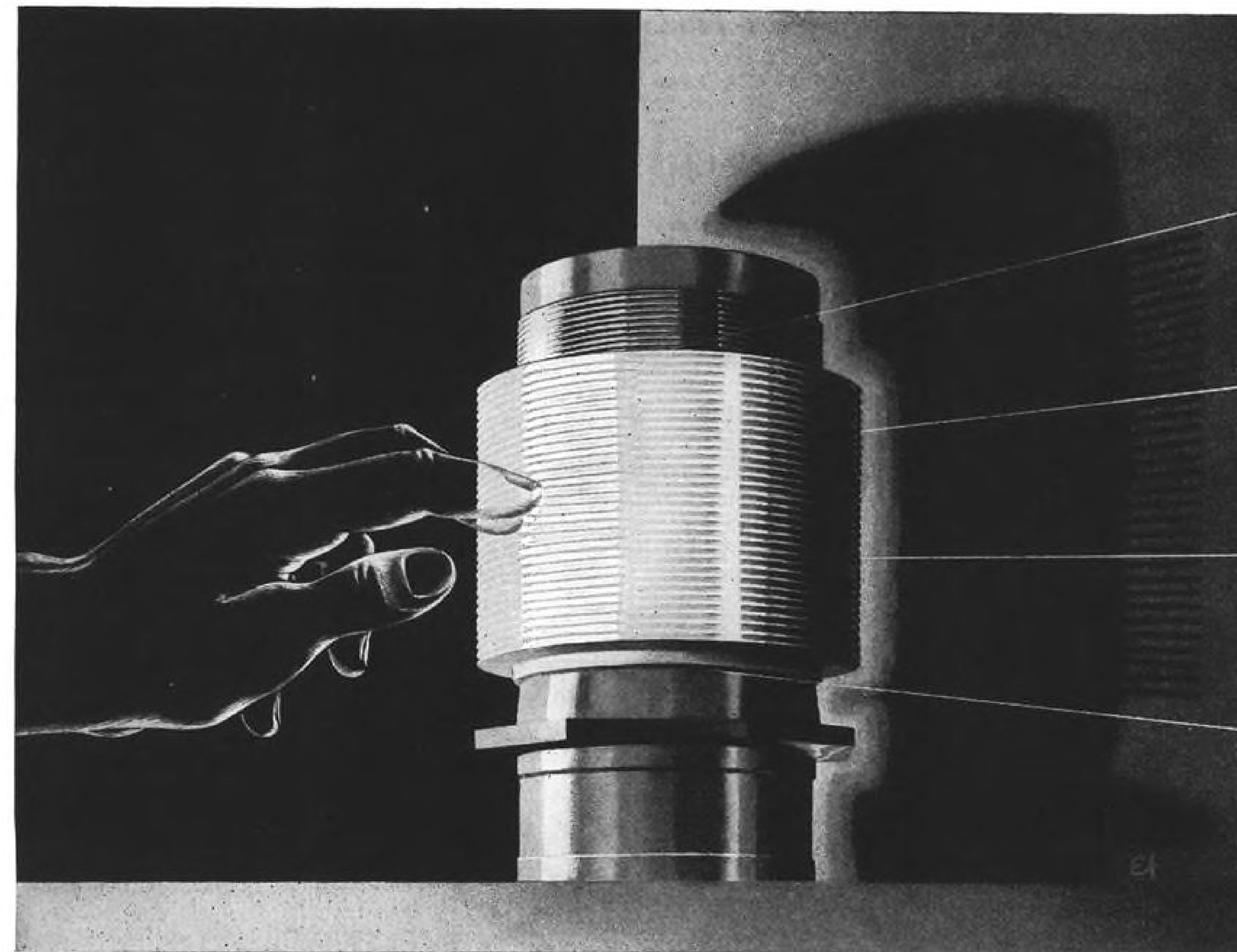
In the first of these applications, an agreement by Braniff Airways for purchase of the Mexican stock from T. E. Braniff is submitted for CAB approval.

In the second, T. E. Braniff asks approval of his retention of control of the Mexican line if the Board refuses the first request.

► **Conditional** — He also asks that the second application be dismissed if the former is disapproved, inasmuch as he is not a "person controlling an air carrier" under the meaning of Section 408 of the Civil Aeronautics Act.

Section 408 makes Board approval necessary "for any . . . person controlling an air carrier . . . or any person engaged in any other phase of aeronautics, to acquire control of any air carrier in any manner whatsoever."

POINTERS ON ENGINES No. 4 of a Series



Off Comes the Lid of Aircooled Engine Power

A new and outstanding engineering development has come out of Fairchild's laboratories—a unique type of aircraft engine cylinder barrel that will enable American warplanes to fly farther, faster, and higher than ever before.

Heretofore, the power output of aircooled engines has been limited by the cooling capacity of fins tooled from the steel of the cylinder block—or of aluminum alloy fins merely *shrunk on* the cylinder barrel. The inefficiency of heat dissipation by these methods has long presented a problem for the best engineering minds of the world.

Now, by means of Fairchild's "Al-Fin" process*, a solution has been found. This revolutionary development makes it possible *chemically* to bond pure aluminum fins to

the steel barrel to form an integral whole. The ferric-aluminum bond perfects the heat-conductivity at the point of contact. As a result, engine heat is drawn off much faster than by the methods previously employed.

Ranger 12s with "Al-Fin" cylinder barrels now produce more horsepower per pound of weight than other comparable engines.

The "Al-Fin" process is another example of the "touch of tomorrow" achieved by Fairchild engineering. A notable advance that helps build better warplanes today—as forerunners of better civilian planes tomorrow.

*All rights to the process are vested in Al-Fin Corporation, a wholly-owned subsidiary of Fairchild Engine and Airplane Corporation, and are available, under license, to others.

BUY U. S. WAR BONDS AND STAMPS

RANGER AIRCRAFT ENGINES

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PRIVATE FLYING

Lightplane Leaders Discuss Design, Outlook at Detroit Meeting

Record crowd of about 400 gathers for sessions on post-war production and distribution problems sponsored by Institute of Aeronautical Sciences.

By BLAINE STUBBLEFIELD

Despite low estimates from conservative quarters on the post-war lightplane market, a record gathering of industry members at Detroit recently optimistically discussed design and distribution improve-

ments in preparation for a new era in personal flying.

About 350 participants were registered at the Horace H. Rackham Educational Memorial, whose auditorium was made available

to the Institute of Aeronautical Sciences, sponsors of the convention. Officials said total attendance was about 400, some not having been registered. The program filled the society's afternoon and evening sessions of April 27 and 28.

► **Open-Minded Attitude** — Most noticeable trend, on the platform, in floor discussion, and in the hallways, was an open-minded attitude toward almost any rational proposal—technical or commercial. If any member felt that he had a perfected airplane, he didn't mention it. All discussion indicated eagerness to try new designs, new devices, improved sales-plans as proposed.

Almost totally accepted among attending lightplane builders was the general proposition that present designs are seriously limited in utility. But the majority seemed determined to drive ahead with improvements on present designs rather than wait for a radical departure, namely rotary wing machines, to solve the problem. Nearly all commentators admitted that rotary wing and direct lift are highly desirable, but they thought the fixed wing type has advantages which could bring it out ahead, or holding its own. Several men said they believed the post-war market for personal planes will be much larger than the average estimate as of today.

► **Technical Papers**—In all, 22 technical papers were presented by officials and engineers of aircraft and components manufacturers, of schools, and of the Civil Aeronautics Authority.

The engineering quality of the papers, which were selected by the meetings committee of the Society, was generally high. A few offerings were criticized privately as being verbal advertisements for the speakers' products. This was excusable, convention veterans said, since the paper gave useful information. One engineer, with a large airplane producer, said the discussion was better organized and more along constructive lines than any he had ever heard, and that time was well spent, with a minimum of frivolity.

Many persons in attendance, and some who took the speaker's stand, represented large companies, whose aircraft and other products do now, and will in the future, play an important part in the design of airline equipment, particularly for feeder lines.

► **War Production By-Products**—

Technical Papers

Technical papers presented at the meeting of lightplane industry leaders in Detroit follow, with names of their authors and the firm or organization they represent:

"Unit Cabins to Increase Comfort of Light Aircraft," Kenneth B. Turner, Bristol Aircraft Division, Universal Moulded Products Corp.

"Structural and Design Problems of Light Aircraft," C. M. Jamieson, Culver Aircraft Corp.

"Wing Flaps in Light Aircraft Design," Maurice A. Garbell, Consolidated Vultee Aircraft Corp.

"Regulatory Standards for Light Aircraft Design," Edward P. Warner, Civil Aeronautics Board.

"Structural and Design Problems of Light Aircraft," Stanford J. Stelle, Civil Aeronautics Administration.

"Sandwich Construction," N. J. Hoff, Polytechnic Institute of Brooklyn, and S. E. Mautner, Skydyne, Inc.

"Debut of the Aeromatic Propeller," S. H. Fedan, Aeromatic Aircraft Propellers, Koppers Co., Bartlett Hayward Division.

"Aircraft Hydraulic Pumps and Related Accessories," John A. Lauck, Pesco Products Co. Division, Borg-Warner Corp.

"An Approach to Inlet Manifold Tuning for Increased Power," Gordon C. Seavey, Aircooled Motors Corp.

"Analytical Investigation of Problems concerning the Flow of Cooling Air in Light Airplane Engine Installations," John R. Weske, Case School of Applied Science.

"Packaged Power," Frederic G.

Rohm, Lycoming Division, Aviation Corp.

"The Government's Place in the Development of Private Flying," W. A. M. Burden, Assistant Secretary of Commerce (for Air).

"What Instruments for the Light Plane?" Frederick H. Smith, Sperry Gyroscope Co., Inc.

"Instruments and Accessories," Andrew A. Kucher, Research Laboratories, Bendix Aviation Corp.

"Lightweight Magnetic Direction Indicators," G. M. Giannini, Autoflight Corp.

"Suggestions for Furthering Private Flying," John H. Geisse, Civil Aeronautics Administration.

"Save Money by Spending It—on Flaps and Retractable Gear," R. H. Upson, H. J. Heinz Co.

"Flight Strips for Civilian Use," Stedman Shumway Hanks, Colonel, Air Corps (Inactive—AUS).

"Motogliders—A Natural Link Between Gliders and Light Planes," Wieslaw Z. Stepniewski, de Havilland Aircraft of Canada, Ltd.

"Prediction of Longitudinal Dynamic Stability," H. P. Liepman, University of Cincinnati.

"Airworthiness Requirements—Their Principles and Application," Eugene W. Norris, Aeronautical Chamber of Commerce of America, Inc.

"Recent Progress on the Bell Helicopters," Arthur M. Young, Bell Aircraft Corp.

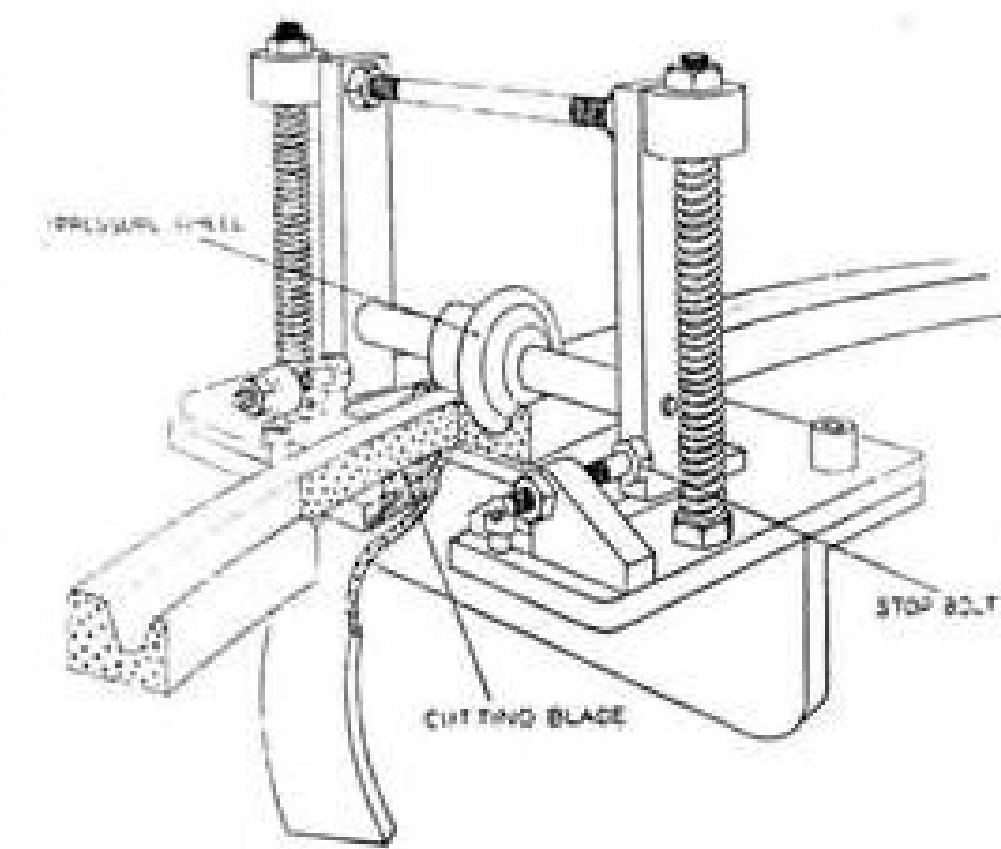
The meeting did not, of course, reveal all important engineering projects of the various manufacturers. Developments that promise sales advantages are being kept behind locked doors. Many of these are the by-products of war production; some are the work of a few engineers who can be spared from war work, now that many military designs have reached a settled stage; some of course are merely bright ideas on paper or in somebody's head.

Design competition is very keen, and with good reason. The shake-down period, like the one in the early years of this century that made collectors' items of a majority of automobiles, is at hand. Scores will try their luck and their skill, but only a few, with superior design and sound financing and distribution, or more than their quota of luck, will survive.

► **Helicopter Film Shown**—There were no exhibits at the convention, except a couple of items brought along to illustrate talks. An event of major interest was the showing of a motion picture of the Bell helicopter. The subject is restricted, but observers said the Bell machine incorporates important departures from basic helicopter design. One operational improvement, it was said, is simplification of control which promises to shorten the necessary training period by a wide margin. Arthur M. Young, who heads the Bell development, was referred to as a youngster of extraordinary creative ability. It was pointed out that Bell now has to its credit three pioneering ventures: the on-center-of-gravity-engine fighter design (in the P-39); the jet-powered interceptor (P-63); and now its helicopter.

The meeting was the first strictly lightplane gathering sponsored by the Institute of Aeronautical Sciences. Spokesmen for the Institute said they were pleased with results. They said they had no plans, at this time, for another one exclusively for lightplane builders, but that doesn't mean they won't have. They assured the writer that the lightplane industry will be represented in future meetings.

Chairmen of the four convention sessions, afternoons and evenings of the two days were, respectively: Peter Altman, consulting engineer; James W. Kinnucan, Continental Aviation and Engineering Corp.; William B. Stout, chief of research division, Consolidated Vultee; and Arnold Kuethe, University of Michigan.



GE GASKET SHAVER:

Splitting gaskets in one smooth, continuous cut, this ingenious shaver was built from scrap parts at the General Electric Erie Works. The cutting blade is a broken file ground to razor sharpness. The pressure wheel is the only machined part used, being made to conform to the shape of the gasket. The adjustable nuts make possible cuts of varying thicknesses. In operation, one end of the gasket is placed on the cutter, held in place with the pressure wheel and pulled forward.

Armory Developed From Plywood, Metal

Small hangars may be quickly and easily constructed with a new material produced by U. S. Plywood Corp.

The company recently announced a revolutionary new technique of construction utilizing factory-fabricated plywood-plastic metal panels which retain the outstanding properties of each material.

► **Plywood and Metal**—The material, known as "Armoryply," combines plywood and light metal of paper thickness with a plastic adhesive.

Structures built by this system have 50 percent less dead load, since the one material takes the place of framing, sheathing and exterior siding and roofing. A 20' x 40' Army barracks built in a test of the material required only 2' x 7' x 11' 6" shipping space, the company revealed.

Canada Reports Pilot Surplus

Canada has trained its 100,000th air crew member for the RAF and RCAF under the British Commonwealth Air Training plan, if it is on the schedule announced in the

House of Commons at Ottawa recently by Air Minister C. G. Power.

Power said then that the 100,000 mark would be reached by the end of April. The air training plan, which produced 39,999 airmen in 1943, is expected to produce 44,000 this year.

► **1944 Needs Filled**—"We have all the men we need for 1944," Power said, "and with what is produced in 1944, we shall have the men required for 1945. With the backlog of the accumulation, we shall have all the men required for 1946."

At present there is a surplus of pilots, he said, which explains the closing this year of 28 training schools. This was not a large portion, however, there having been 154 schools at peak period a few months ago, and the air training plan is to keep on for the allotted period after 1945.

Canada to Pay U. S. For Airport Outlay

Canada is to pay the United States for all improvements made on Dominion airfields by the United States, according to Finance Minister J. L. Ilsley.

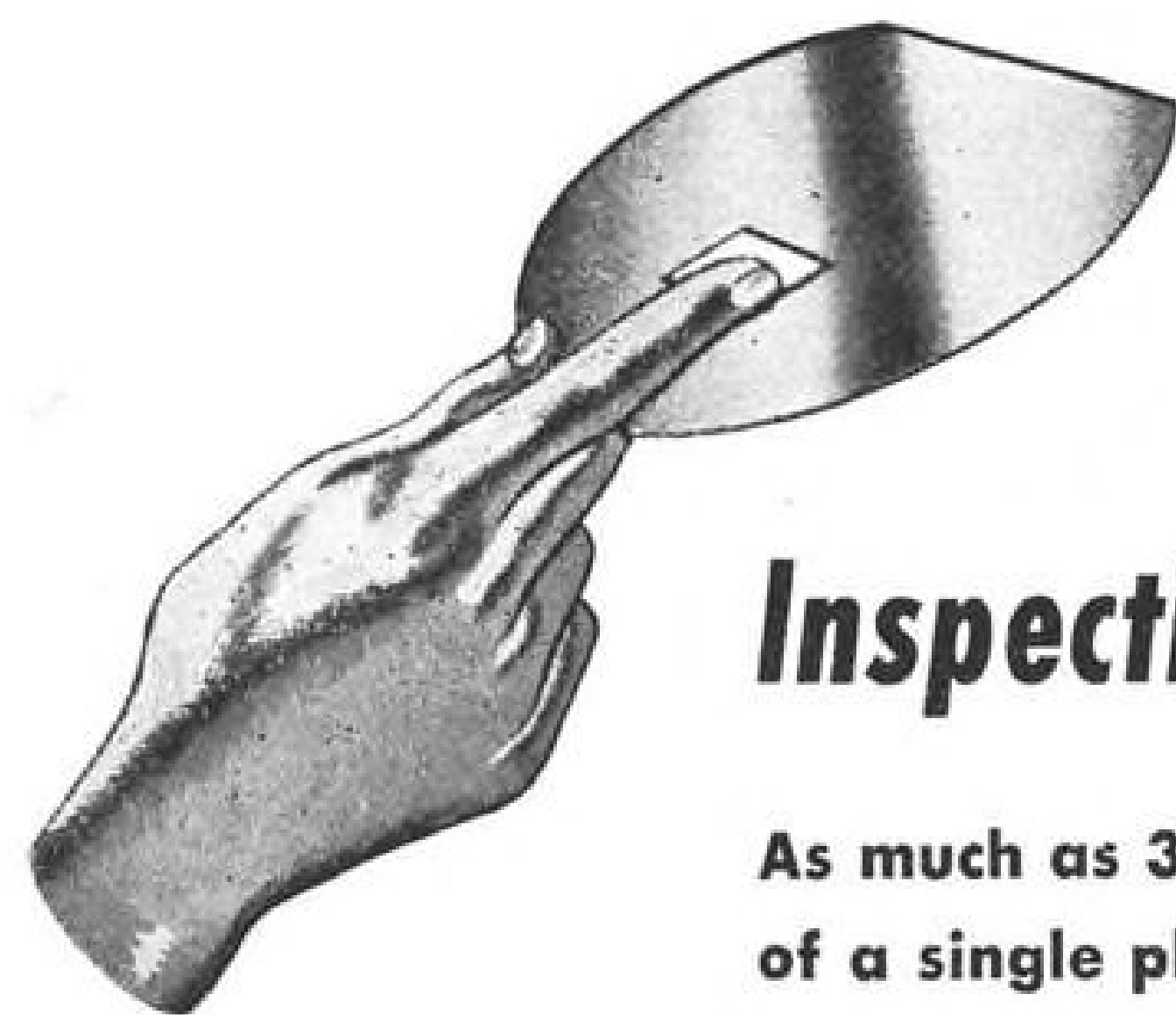
The Dominion announced some weeks ago that it would pay the United States \$54,000,000 for improvements and installations on the Alaska Airway (Northwest Staging Route) and related air routes in northwestern Canada.

► **Includes All Fields**—Ilsley now says the same plan will apply to all other airfields constructed for or on account of the United States for its airmen in Canada.

CAA to Shut Down 24 Control Towers

Operation of 24 airport traffic control towers by the Civil Aeronautics Administration will terminate June 30 because the Army no longer requires them.

CAA now operates 115 towers, including the 24 to be eliminated. The latter are at Akron; Austin; Battle Creek; Burlington, Vt.; Chattanooga; Coeur D'Alene, Idaho; Daggett, Calif.; Des Moines; Helena, Mont.; Houston; Indianapolis (2 airports); Kansas City; Louisville; Mobile; New Orleans; Niagara Falls; Ogden, Utah; Omaha; Philadelphia; Pocatello, Idaho; St. Paul; Sampa, and Yakima, Wash.



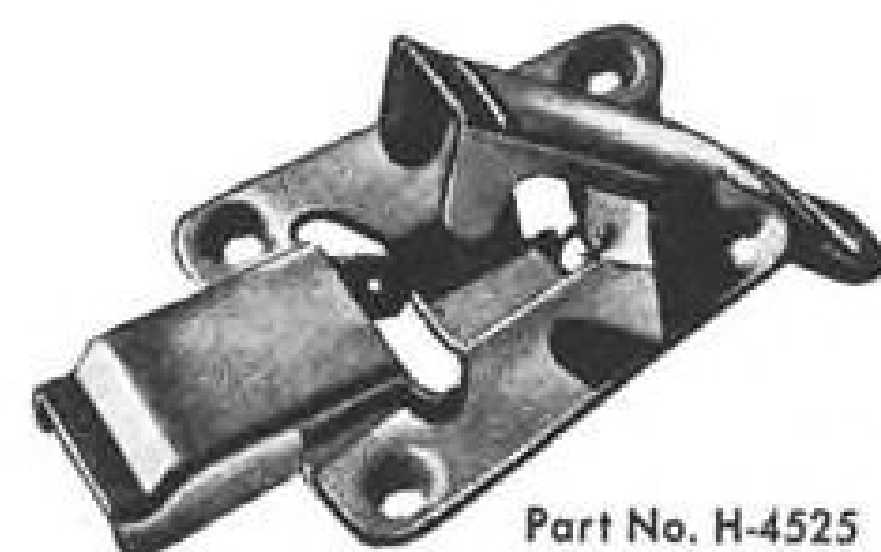
PRESS and the

Inspection Door Flies Open

As much as 30 minutes is saved in the inspection of a single plane by the new Hartwell inspection door latch. That means planes in action faster!



APPROVED BY ARMY AIR FORCES



Part No. H-4525
Patent applied for

The new Hartwell inspection door latch ends the slow, tedious removal and replacement of inspection doors. Simple and rugged in construction, it contains four parts—trigger and bolt, made of light gauge steel, aluminum bracket, and twin springs (two are used for safety). It is light—weighs less than ½ oz.; rivets to the inspection door, and it fits flush!

Press the trigger of the Hartwell latch and the inspection door pops open! Press the bolt and it is locked shut! Two or more latches may be used on a single door, if desired. This inspection time-saver can be installed in a standard Army Air Forces cutout, shown on print 43G2853.

New flush hinge. Available with the new Hartwell inspection door latch is the new flush hinge. It is light and durable. Holds the inspection door to 30 degrees of full opening when it is released by latch. For complete engineering details about latch and hinge write or wire our Los Angeles office.



Single source for 779 different aircraft
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THE AIR WAR

COMMENTARY

New Improvements Give Allied Tactical Planes Important Edge

Increased speed and firepower, teardrop canopy, "para-frags" and development of fighter-bomber important factors in invasion raids.

The most commonly discussed quality in a fighter is speed. People are always asking what is the fastest airplane? Is it the *Mustang* or latest *Spitfire*? The *Thunderbolt* or *Typhoon*? The *Lightning* or newest *Messerschmitt 109*? On the whole this popular instinct is correct, and has the practical on-the-spot backing indicated by a typical remark tossed off by Lieut. Gen. "Tooe" Spaatz shortly after the formation of the Northwest Africa Air Forces last spring. Speaking of the Lockheed *Lightning* he said, "I'd rather have a plane such as the P-38 which can go like hell, even if it does have a few things the matter with it, than one which can't go like hell, with a few things the matter with it!"

Other Qualities Important—Given speed, however, a dozen other factors will be instantly named by top fighter pilots in any air force (the order may vary). High rate of climb and good maneuverability will be well up on any list, followed by heavy firepower, adequate armor, good visibility, handiness of instruments, ruggedness, ease of service, long range (for escort fighters) and good diving qualities and bomb load (for fighter-bombers). As the fundamental role of the bomber continues, and will continue to the end, the versatile fighter is coming into its own as one of the war's key tactical weapons.

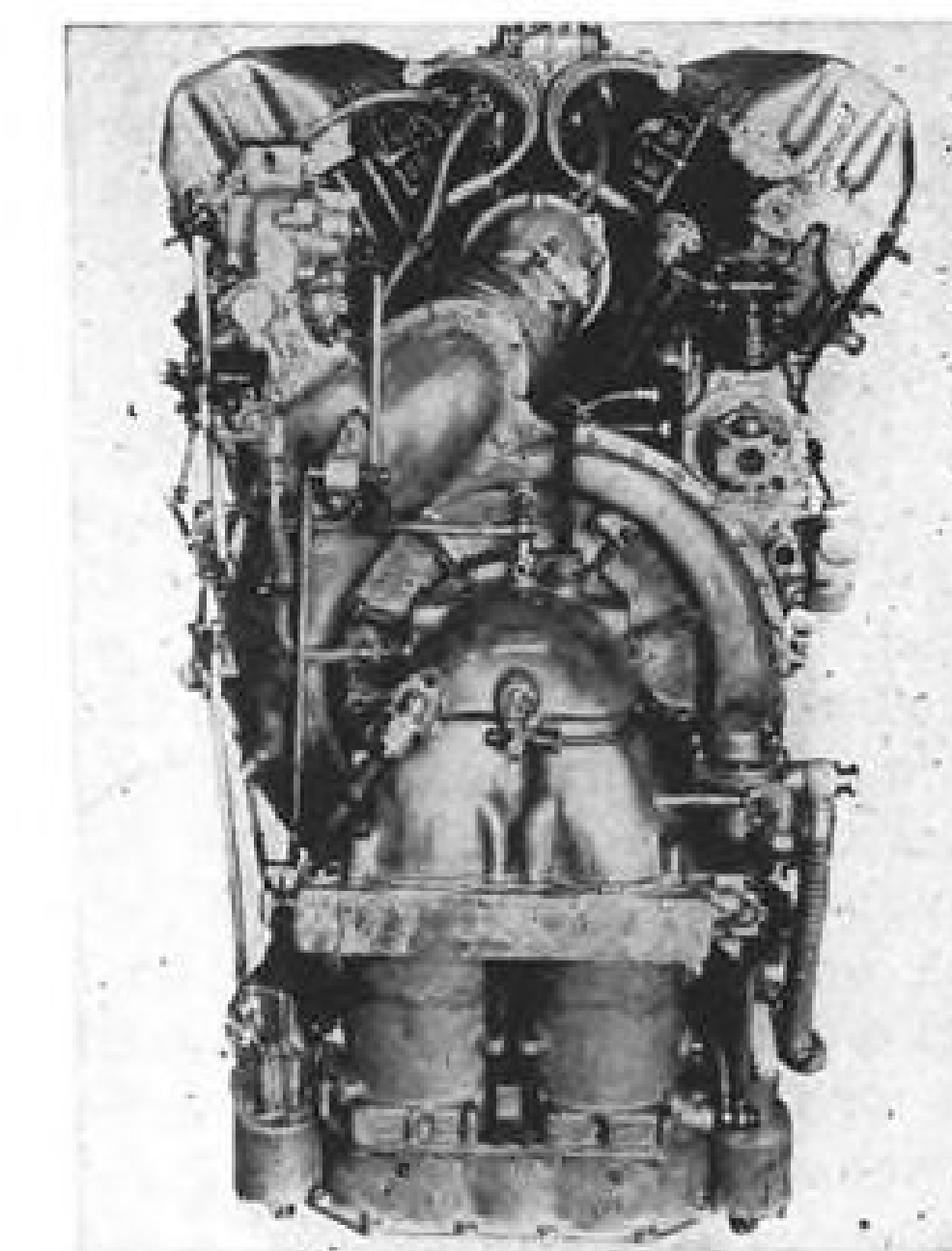
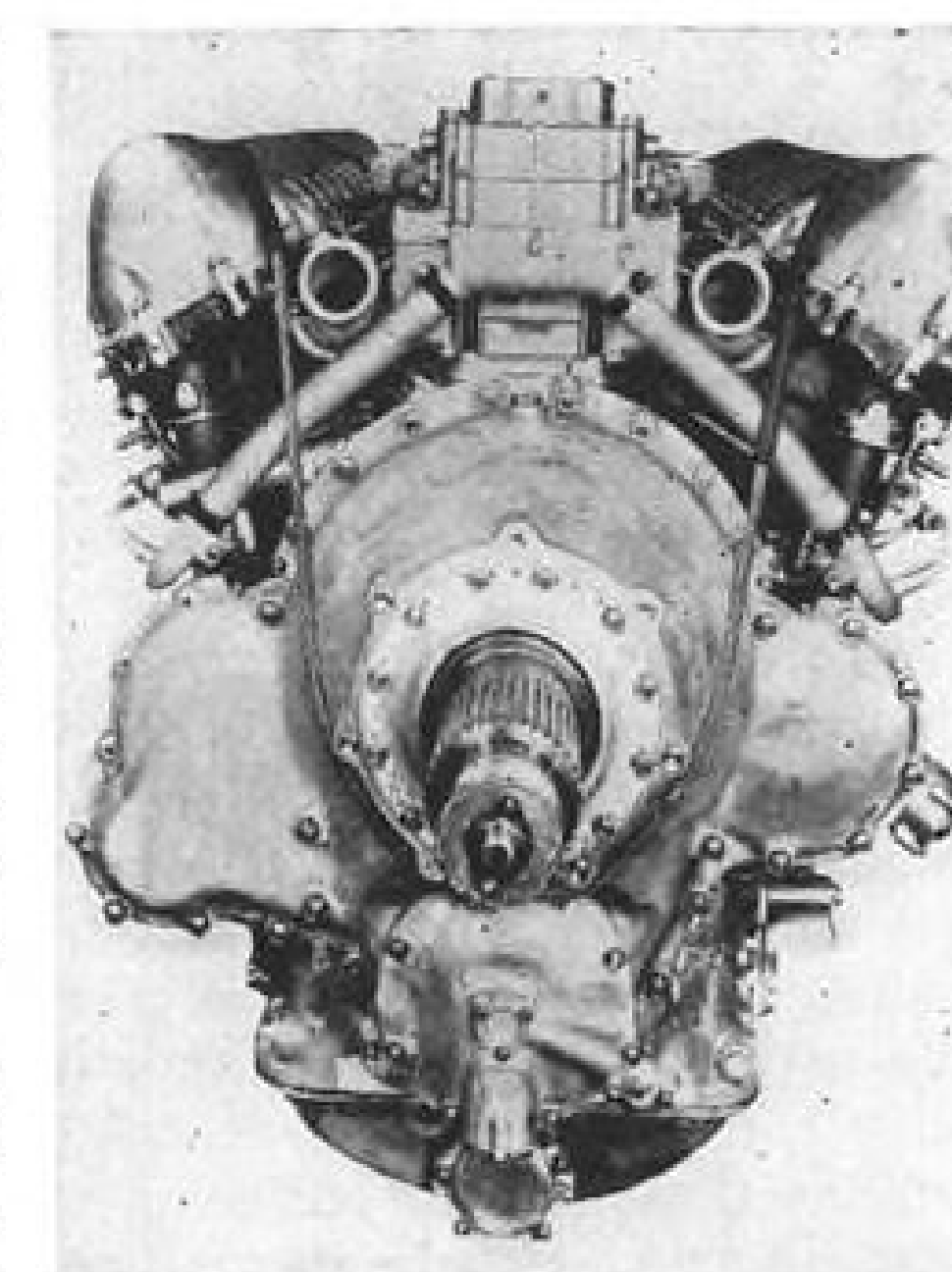
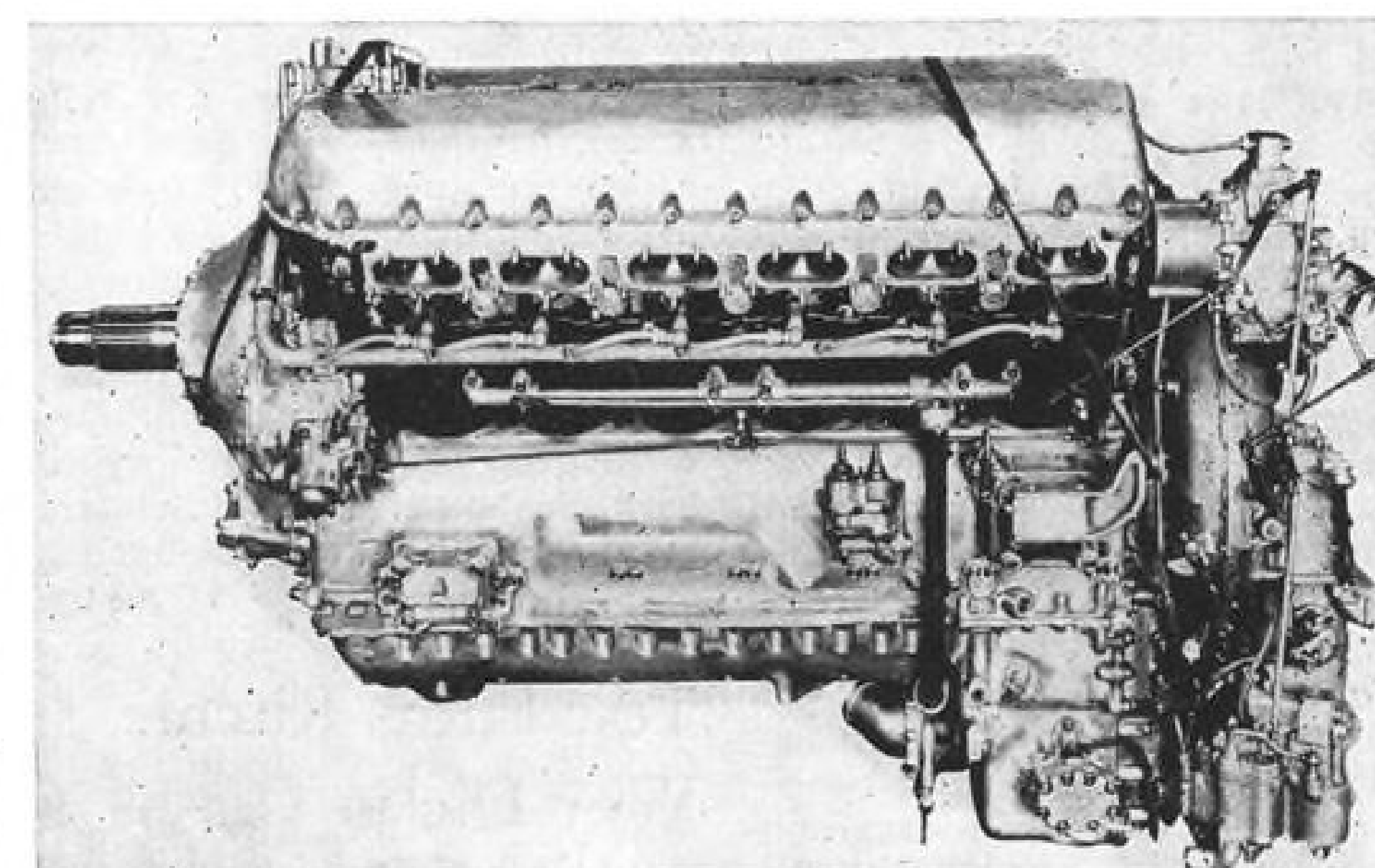
That "Teardrop" Canopy—Here is the newest contribution to good visibility. The Germans seem to have brought it out first, on a late model of the Focke-Wulf 190 fighter, although similar developments were going forward in Britain and the United States. The newest series of the Hawker

Typhoon Mk Ib came out with a "bubble" last year, and some of the latest mark *Spitfires* are similarly equipped.

In this country the newest mod-

ification of the *Mustang* has a completely redesigned "teardrop" cockpit canopy giving the pilot excellent visibility in all directions. It is quite likely that improved models of other American fighters, both Army and Navy, may shortly appear with this feature. The material used is a phenolic, resinous material something like Plexiglas, and is bullet-resistant, though not fully bullet-proof, owing to weight considerations. On the *Mustang* the enclosure can be rolled back hydraulically as an aid in night flying, and whether rolled back or not, this new type of canopy on all fighters so far tested has proved greatly superior for night work over the conventional type.

Bomb-Carrying P-Shooters—One of the most remarkable tactical developments of the war is the fighter-bomber. Coming in low



POWER PLANT OF NEW SPITFIRE:

Shown are three views of the Rolls-Royce "Griffon" engine which powers the new British Spitfire, the Mark XII, recently announced by the Ministry of Aircraft Production.

and fast over the tree-tops the maximum amount of surprise can be achieved. Using regular bombs, or better, delayed action or parachute-bombs ("para-frags"), accurate hits are obtained, and our ship is a fighter again with all the speed, fire-power and maneuverability it requires to fight its way back to base. Sometimes its .50-caliber guns or cannon turn in a strafing job which causes as much or more damage than the bombs. (*Typhoons*, *Spits*, *Mosquitos* and *Lightnings* have 20-mm. cannon, *Stormoviks* have 30-mm., *Aircobras* 37-mm., and *Hurricane* IId's have 40-mm. cannon; latest German fighter-bombers have 15-, 20- and 30-mm. rapid-firing cannon, with reports of 40-mm. on the newest of all.) Compared with the "Hurribombers" of the early fighting in the Libyan desert with their 250-pounders, and the initial use of the P-40's in the first stages of the Pacific air warfare, the present bombloads are fantastic.

The later *Warhawks* in China and in India led the way toward this advance by dropping first 500-pounders, and then in the fight to stifle enemy communications in Burma 1,000-pound "bridge-busters." The Merlin-powered *Mustang* can take a couple of 500-pounders (or heavier), and the powerful *Thunderbolt* carries two 1,000-pound bombs for short distances. The heavily armed *Typhoon* (four 20-mm. cannon) should be able to do the same. The twin-engine *Lightning* has a longer range than other fighter-bombers, with its racks interchangeable for combinations of 500- or 1,000-pound bombs and fuel tanks, an American equivalent to the versatile *Mosquito*, but stinging in daylight. Its opposite number in the Luftwaffe is the ME-410. All these Allied fighter-bombers, as well as the new clipped-wing low-level *Spitfire*, are now carrying out a terrific program of escort missions and fighter sweeps—high level, low level, dive-bombing, strafing—against enemy airfields, communications and other objectives to the tune of 2 or 3 per day, with relief pilots for the second or third shifts. In the days and weeks ahead, this will mount up to a crescendo of tactical air power such as the world has never seen.

Increased Radius of Action—Rapid strides have been made to adapt the 1943 crop of fighters as either "long range" fighters for escort work or as fighter-bombers



KNOX

to increase their radius of action. Since last summer, increasingly large drop tanks have been used by Allied and enemy fighters, the latter to insure staying power to attack crippled *Fortresses* and *Liberators* and their escorting fighters on the homeward journey. In addition to this, greater built-in tankage has increased the basic range of improved models of the *Thunderbolt*, *Lightning* and *Mustang*. As the lines are pushed back, this extra couple of hundred miles radius of action will be a priceless benefit. NAVIGATOR

Test Pilots Ritchie, Wey Die in Crash

Wright Field's roll of test pilots who gave their lives in flight testing new army aviation developments, saw two new names added with the deaths of Maj. Perry J. Ritchie, 27, Dayton, and Lieut. W. R. Wey, 24, Eldorado, Ark., at Los Angeles, municipal airport, Apr. 24, in the crash of a B-25 bomber which they were test flying.

The roll includes Barksdale, Elmhendorf, Woodring, McClellan, in addition to a number of lesser known pilots.

Ritchie Holder of DFC—Major Ritchie, recognized as one of the most expert Materiel Command pilots, had only recently returned to flying status, after suffering a back injury last summer when parachuting from a burning fighter plane he had been testing at extreme altitude, near Wright Field. He was awarded the Distinguished Flying Cross last December.

Navy Air Arm Built To Peak Under Knox

Late Secretary was most air-minded member of Roosevelt's Cabinet.

Since July 11, 1940, when the late Frank Knox took the oath of office of Secretary of the Navy, Naval aviation has risen from a small segment of the U. S. Navy to a vital part of our ocean defenses. As the highest tribute he could pay aviation, Secretary Knox established the position of Deputy Chief of Naval Operations for Air and appointed Vice Admiral John S. McCain as deputy for Admiral Ernest King, commander in chief.

Secretary Knox died Apr. 23, 1944, of a heart attack. The most air-minded cabinet member, Knox had flown an estimated 200,000 air miles since he took office. On his log are recorded two round trips to Pearl Harbor, approximately 20,000 miles in the European theater and 30,000 miles in the Pacific. He traveled by plane throughout this country also.

Built Up Navy Air Strength—When Knox took over the top Navy position, the total Navy strength in planes was 2,112 of all types, while at his death the Navy had 42,600 aircraft, including more than 30,000 combat planes. Under his guidance the aircraft carrier strength has risen from 6 to more than 70 carriers including baby flat tops.

A gigantic training program of Naval aviators, to match the growth in air strength, was launched by Knox's Navy and tremendous training fields at Corpus Christi, Tex., Jacksonville, Fla., and Pensacola, Fla., were built and placed in full operation. Corpus Christi is the site of the largest Naval Air Training Station in the world.

Plane Compass Used On Invasion Craft

The magnesyn remote reading compass used on fighter planes has been adapted for use aboard invasion landing craft, Bendix Aviation Corp. has revealed.

The compass weighs less than five pounds and is used in the split-second timing and accurate hitting of landing points necessary in invasion operations.

PERSONNEL

Brig. Gen. John M. Clark, commanding general Middletown, Pa., Air Depot, Air Service Command was awarded the Legion of Merit because he "conceived, planned and developed mobile repair units designed to bring repair facilities to crash landed aircraft, thereby effecting a saving of two-thirds non-operational time. His conception, energetic organization, and capable direction of this plan resulted in the return to operations of 83 four-engine bombers not otherwise repairable. . . ."

George W. Gibbs, Jr. has been elected a director of National Airlines, Inc.



He is treasurer and general manager of Gibbs Gas Engine Co., Jacksonville, Fla., vice-president and director of Gulf Atlantic Transportation Co., vice-president of Gibbs and Har-

ison, Miami, and vice-president of the Miami Marine Construction Co. T. C. Sullivan has been named assistant to the president of United Aircraft Corp. Sullivan was an aviation writer for the *Wall Street Journal* and later joined Vultee Aircraft Co. as assistant to the president and secretary of the corporation. He is well known in the aviation writing field.

Tolbert A. Rice (photo), assistant to the manager of the Atlantic Division, Pan American Airways, has been named district manager for the United Kingdom and Eire, with headquarters in London. At the same time it was announced that A. Jackson Kelly, dis-



trict traffic manager and senior representative of the airline in England, was being furloughed home after two years abroad and later will be assigned to division headquarters at La Guardia Field, N. Y. Rice has served Pan American at Wake Island, Manila, Singapore, India, Africa and Bermuda.



MAPS POST-WAR OUTPUT:

Col. Philip J. Reilly, managing director of the Associated Merchandising Corp., has been named by Aviation Corp. to head a distribution program for the corporation's planned post-war production of household appliances.

Hayes Dever, assistant to Pennsylvania-Central Airlines President C. Bedell Monroe, has been elected secretary of the airline.

Dever has been with PCA since 1935 and has served as assistant secretary, assistant vice-president and assistant district traffic manager at Pittsburgh.

M. J. Brown has been named assistant to the Treasurer of Chicago and Southern Air Lines. His former position as chief accountant has been filled by J. H. Quinn. Jane Russell, personnel technician for Chicago and Southern has become supervisor of stewardesses, replacing Mildred Jackson, who has resigned.

Maj. Gen. William O. Butler has assumed command of the AAF Eastern Flying Command, with headquarters at Maxwell Field, Ala. He succeeds Maj. Gen. Thomas J. Hanley, Jr., whose new assignment has not been announced.

Lieut. Col. Howard A. Rusk, chief of the AAF Convalescent and Training Branch, was presented with one of the \$1,000 Eighth Annual Lord and Taylor Design awards for "out-



CELEBRATES 49 YEARS OF NAVY SERVICE:

Following 49 years in the Navy, Vice Admiral Henry Varnus Butler (Ret.) was presented with an oil painting of a U. S. aircraft carrier flying his flag. Ben Abbott, (center) executive assistant to Admiral Butler, and Col. Miles R. Thacher, USMC, provost marshal (right), presented the painting. Admiral Butler has held command of Aircraft Squadrons of the Battle Fleet, Aircraft, Battle Force, and many other important commands. He recently celebrated his 70th birthday.

Trail Blazing in the Skies

PIONEERING NEW METHODS

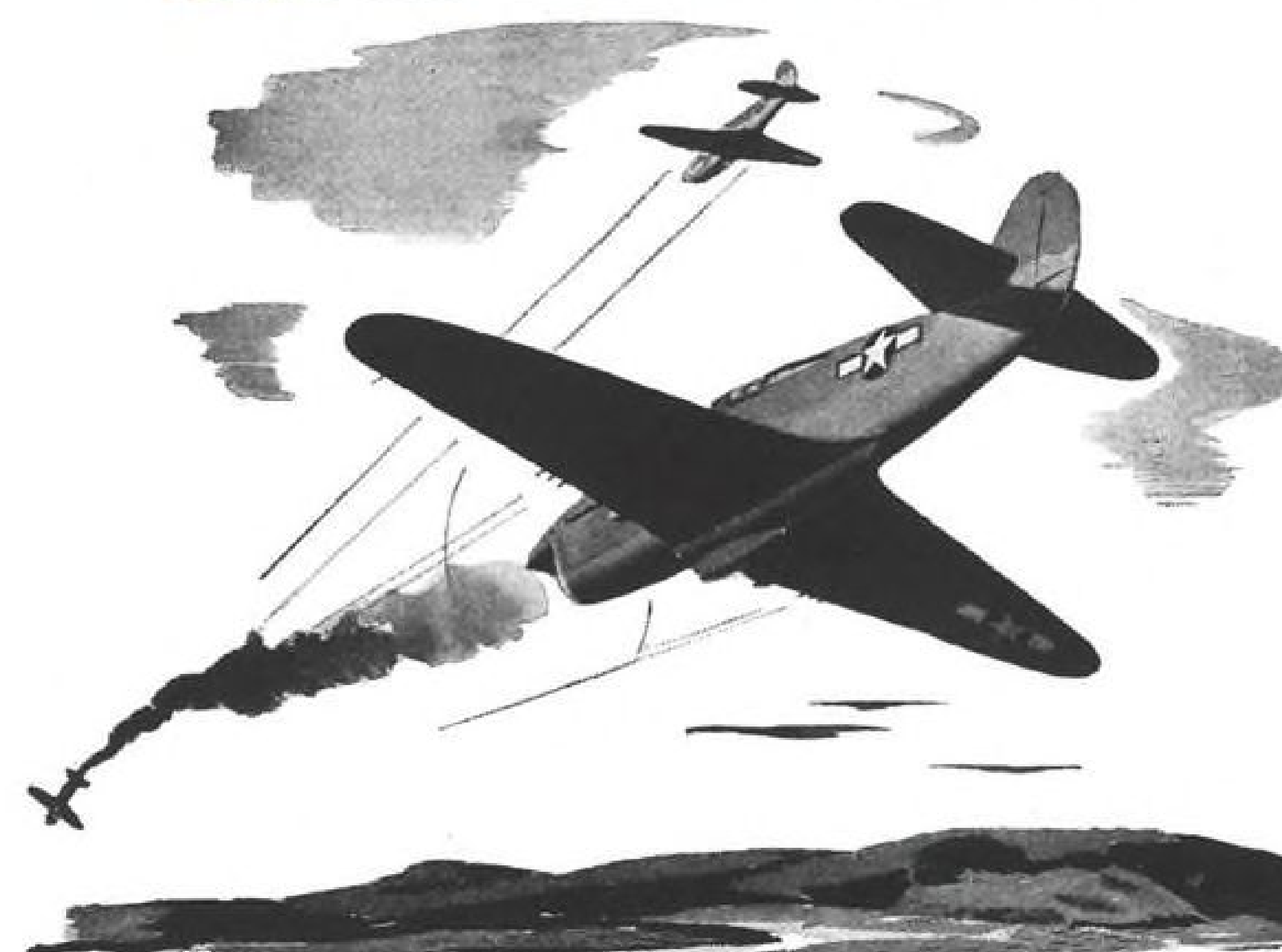


NEW PRECISION IN MEASURING CABLE TENSIONS — Illustrative of Goodyear Aircraft Corporation's thoroughness in every phase of airplane construction is the development of the precision cable-tension indicator. This highly accurate instrument, built by Goodyear, measures the exact tension on airship and airplane control cables, giving an instant reading correct to the pound. With this device the cable does not have to be disconnected, making it possible to determine tensions precisely after installation. Many of these instruments are now being used by the air services.

HOW GOODYEAR AIRCRAFT CORPORATION SERVES THE AIRCRAFT INDUSTRY

1. *By constructing subassemblies to manufacturers' specifications.*
2. *By designing parts for all types of airplanes.*
3. *By re-engineering parts for mass production.*
4. *By building complete airplanes and airships.*
5. *By extending the facilities of Goodyear Research to aid the solution of any design or engineering problem.*

BUILDING PROVEN AIRCRAFT



THE RELIABLE P-40 WARHAWK is one of America's famous war-planes built in part by Goodyear Aircraft. Several thousand P-40's have flown into action with stabilizers that came from Goodyear assembly lines. Goodyear is proud that its long experience in aviation has contributed materially to the sturdiness of this rugged fighter — only one of many equipped with Goodyear-built wings, empennages, flaps, ailerons and numerous other components. Goodyear also builds complete airplanes and airships for the Navy.

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standing contributions in the field of rehabilitation through a program following the Army's theory that the bodily activity rather than lack of it has definite therapeutic value." Colonel Rusk was formerly an instructor of medicine at St. Louis University and Associate Chief of Staff at St. Luke's Hospital.

Frank C. Dyer, superintendent of communications for Braniff Airways at Dallas, will assume charge of preparations for the operation of Aerovias Braniff, S. A., a Mexican airline. In Mexico he will supervise training, installation of equipment, selection of personnel, and development of operations to carry out the program.



Robert D. Watson, administrative assistant to the chief engineer of Northwest Airlines, has been appointed assistant to the general traffic manager. As administrative assistant to Karl O. Larson, he compiled important traffic and operations data used by the airline in support of its application for a New York extension recently heard by the CAB.



E. B. Sporleder, executive engineer of Douglas Aircraft Co., Inc., was named National chairman of the Air-



GETS SERVICE PIN:

Carl F. Schory, service manager of Hamilton Standard Propellers Division of United Aircraft Corp., receives his 15-year pin from General Manager Sidney A. Stewart. Before starting with Hamilton Aero Mfg. Co. in 1929, he served as secretary of the contest committee of the National Aeronautical Association in Washington.



Sporleder

worthiness Requirements Committee of the Aeronautical Chamber of Commerce of America at the annual meeting of the Committee of St. Louis.

John W. White has been elected president and general manager of the Westinghouse Electric International Co. William E. Knox, formerly assistant general manager, has been elected vice-president, replacing White. George H. Bucher, president of the Westinghouse Electric and Manufacturing Co., becomes chairman of the Board of the International Co.

J. E. Tweeddale, until recently on special leave of absence from Bell Telephone Laboratories to Columbia University's War Research division, has taken over coordination and production programming of thermistors, varistors, glass-sealed switches and carbon-deposited resistors in the radio division of Western Electric Co.

Lee J. Robison has been appointed sub-division head for Industrial and Public Relations at the Douglas Aircraft Oklahoma City plant. He has been assistant to the vice-president of Cities Service Gas Co. and served four years as vice-president of the Chamber of Commerce of Oklahoma.



G. J. Dye is the new superintendent of maintenance for Delta Air Lines. He was formerly assistant superintendent and started with Delta in May, 1936, as an airplane and engine mechanic. He has been crew chief and machine shop foreman.



President Roosevelt has nominated Maj. Gen. Louis H. Brereton, commanding general of the Ninth Air Force, and Maj. Gen. Barney Giles, Chief of Air Staff, to be temporary lieutenant generals. Brig. Gen. Elwood R. Quesada, commanding general of the Ninth Air Force Fighter Command, has been nominated for major general.

Dr. Laurence C. Hicks (left) has been appointed metallurgical engineer and associate director of re-



Hicks

Thielemann

search in the Magnetic Products Division of Allegheny Ludlum Steel Corp. at Brackenridge, Pa. R. H. Thielemann has been named development engineer for the company.



NEW ATC PRESS CHIEF:

Lieut. Col. John C. Henry has been appointed special assistant to the Commanding General of the Air Transport Command, succeeding Lieut. Col. Rex Smith. The function of the office is public relations for the ATC. Colonel Henry, formerly White House correspondent for the Washington Star, has seen operations of the ATC all over the world. Before his present assignment he served as aide to Maj. Gen. Patrick Hurley and accompanied him on special missions. Colonel Henry was recalled to the ATC on Apr. 5 and assigned to Maj. Gen. Harold George. He has been on active duty since June 10, 1942.

AIRCRAFT PRODUCTION

Chamber Asks Speedy Action On Competitive World Airlines

Final draft of declaration drawn up by top manufacturing officials at the Los Angeles meeting calls for expansion of air commerce.

Expansion of operations of domestic airlines before the end of the war, immediate extension of international air commerce, re-establishment of the Office of Assistant Secretary of Commerce for Air, competition in commercial air transport and maintenance of a sound aircraft industry by the U. S. as a dominant air power constitute the basic policy of the Aeronautical Chamber of Commerce.

Adopted at its Los Angeles meeting, the policy declaration in its final form warns against stripping aircraft plants of young engineers, pointing out that technological superiority must be maintained, and cautions the government that its responsibility in contract terminations requires that it must meet all costs, including separation wages, since the magnitude of expansion makes the industry vulnerable.

► **Sound Surplus Program**—The Chamber also calls for a sound surplus plane policy: use of surplus planes early enough will aid in creating demand for improved equipment, but improper use could destroy the manufacturing industry.

Military and Naval plans, the statement of policy declares, could approximate future requirements for several reasonable assumptions, and knowledge of these would assist private companies in their planning. At the same time, the declaration expresses gratification at the steps being taken in the matter of government-owned facilities, saying the private aircraft industry could not survive government competition.

► **More Domestic Service**—Calling for increased operation of domestic airlines, the Chamber urges this as a means of relieving overburdened surface transport and speeding the conduct of war business.

Expansion of international air transport should be taken in hand "as an immediate contribution to

the war effort and a wise provision for future needs." Expansion of airmail offers a profitable method, says the statement.

► **Ask Executive Department**—Placing responsibility for commercial air transport in an executive department is asked, with the State, War and Navy Departments collaborating with the department charged with commercial responsibility in operation of an American airpower policy. In this connection, the Chamber urges that the Office of Assistant Secretary of Commerce for Air be re-established.

Competition in commercial air transport is essential to technical progress, the Chamber declared.

► **U. S. Can Compete**—Scoring those who maintain that the United

States cannot compete with other nations in aviation, the Chamber points out that "The self-reliant young American aircraft industry, maintaining a high level of wages and salaries, was able to undersell all foreign competition even though some of this was subsidized."

Citing the experience of the country that "Our people have long been persuaded that expenditures in preparation for war are out-of-pocket expense," the Chamber declares that "From the economic point of view, we could credit the airmail profit back against the cost of military and Naval aircraft . . . but a strict accounting isn't necessary to prove that providing for the common security is not necessarily a burden upon the people. Done through private industry, it can be an investment."

► **Summary**—Summarizing, the Chamber stated that: "International, domestic and private air transport offer a source of new wealth and employment. Rapid development is dependent upon improved technology stemming from a strong competitive manufacturing industry. A dominant military and Naval air force supported by air bases is a prerequisite of communication by land, sea and air. Only an air-minded people can provide that controlling airpower which, in the hands of free men, is the hope of lasting peace and prosperity."



DOUGLAS SKYTRAINS FOR INVASION:

C-47 transports have been rolling off Douglas assembly lines in increasing numbers during the past few months to meet demands for extra planes for the AAF. Three thousand of these planes had been built up to early February. Domestic airlines have been restricted to 200 planes of similar and smaller type, had fewer than 400 at their peak and now hope to get back some they sold the Army after Pearl Harbor and possibly some of the new crop. Invasion results may determine whether or not the airlines will get this badly needed equipment.

C-W Plant Doubles Helldiver Output

Columbus unit hits stride after long struggle with design changes and assembly line problems.

The much-criticized Columbus, O., plant of Curtiss-Wright Corp. has more than doubled production in the past six months. The plant has been building *Helldivers*, an advanced dive-bomber model with which considerable difficulty was encountered and finally mastered.

The model now being produced is the SB2C-3, embodying major changes from the SB2C-1 first put into production at the plant.

► **Powered By Cyclone**—The *Helldiver* now is powered by a Wright Cyclone turning up substantially more horsepower than the 1,700 hp. Wrights used in the first models. A four-blade constant-speed, full-feathering propeller has replaced the three-blade propeller used on the SB2C-1.

Helldivers have been in action since last November, when they were introduced to the Japanese at Rabaul. Since then they have been in all major actions of the fleet.

► **Output Increased** — Production has been on the upgrade since last October, when 103 percent of the schedule was met. In November, production was 105 percent, in December, 111 percent; in January, 126 percent, and in February, 133 percent. Schedules were increased for March, and the quota met and passed by one percent.

The seven-ton *Helldiver* was rushed into production after Pearl Harbor and, being a highly ad-

vanced type of ship, many difficulties were encountered in bringing it to combat utility. The prototype crashed in tests, and the first models were brought out before extensive flight tests could be made. The plane is considered one of the most complicated types ever built.

► **Truman Inquiry**—Production at the plant was the subject of a Truman committee investigation last year, just about the time the plant was ready to go into production of the improved plane. Production was low because of assembly line and design difficulties and changes, but took a sharp upturn when improvements to the plane were completed and when new assembly line feeding methods were introduced by E. J. Harrington, former vice-president of Lockheed Aircraft Corp., who had been elected a vice-president of Curtiss-Wright in charge of materials. His material control plan eliminates parts shortages on the assembly line and permits full-efficient use of parts manufacturing equipment.

Less than 10 percent of the workers in the plant had previous aircraft construction experience, and a vast schooling program was one of the first projects.

New Brake Machine

A new aircraft brake drum truing machine which its developers say has been designed to meet the specific needs of military aircraft maintenance, is being offered by Lempeco Products Inc., of Bedford, Ohio. Makers of the machine say the turret can be rotated in thirty seconds to change over from turning to grinding.

Sikorsky Develops 2 New Helicopters

Sikorsky Aircraft has developed two new helicopters of increased size and carrying power "which will go into production during the year," Frederick B. Rentschler, chairman of the board of United Aircraft Corp., told stockholders at their annual meeting in East Hartford, Conn., recently.

► **14-Passenger Model**—Sikorsky has been working on a helicopter designed to carry a minimum of 14 passengers, and it is believed to be this helicopter that Greyhound Bus Corp. had in mind when representatives told the CAB at its recent feeder line hearings that the bus company would put all its faith in helicopters for post-war passenger service.

Rentschler also told stockholders the 1944 output of engines, propellers and aircraft designed by the corporation probably would be the greatest in its history.

Goodyear to Make P-38 Tail Surfaces

Goodyear, now turning out *Corsairs* and blimps for the Navy, will make twin tail surfaces for the P-38 *Lightning* fighters.

The company, long a producer of wheels and brakes for many types of planes, has been making parts for the Grumman *Hellcats*, Martin PBM's and other fighting craft, while the parent company, Goodyear Tire & Rubber, has been producing airplane tires, bullet seal fuel tanks, fuel hose and other rubber parts for aircraft.

BUT WILL IT FLY ?



PUT the armour of a tank on it, give it the fire-power of a tank destroyer, send it up into the stratosphere and give it power to out-speed anything that flies. That, in essence, was the kind of airplane the A.A.F. Matériel Command needed . . . and wanted Republic to build.

On paper, the P-47 Thunderbolt looked formidable—over six and a half tons of the most concentrated aerial fighting power ever designed. Certainly, anyone would have been forgiven for asking: "But will it fly?"

The answer has been dramatically written by Thunderbolt pilots in every theater of war. It is commonplace to read in the papers where Thunderbolt pilots are besting the enemy by scores of up to 7 to 1.

Thunderbolt performance is, indeed, one of the near miracles of this war . . . thanks in great part to the men

who fly them. And Thunderbolt production is another remarkable achievement. In eleven months from the word "go", the P-47 was designed, engineered, developed, fabricated . . . and flown!

Republic has been consistently breaking aircraft production records ever since . . . despite the fact that its engineers are daily remoulding the Thunderbolt to meet the latest needs of combat. It is ever and always a new airplane. But because of Republic's uniquely flexible production system, there is never a halt in the flow of Thunderbolts to our fighting men.

Republic Aviation Corporation, Farmingdale, Long Island, New York, and Evansville, Indiana.

Republic *firsts* in war
point to *firsts* in peace



REPUBLIC AVIATION CORPORATION

Specialists in High-speed, High-altitude Aircraft

WRITE THAT BOY TODAY — V-MAIL! FARMINGDALE DIVISION



New SB2C Curtiss Navy "Helldiver": The 13 test pilots of the Columbus, Ohio, plant of Curtiss-Wright Corp. Airplane Division line up on the wings of the new Helldiver, which is equipped with an even more

powerful Wright Cyclone engine and a new Curtiss Electric constant speed, full feathering type propeller, with four six-foot hollow steel blades. The Helldiver has proved itself in the Pacific.

Fighters May Get New Oxygen Tanks

Automatic Units, used on bombers, are regulated by barometric pressure.

Tests now being conducted may result in fighter plane installation of automatic oxygen metering equipment that for the past twelve months has assured American bomber crews of an accurately measured oxygen supply at all altitudes.

Complete freedom to concentrate on flying and fighting, without the added worry of controlling oxygen supply, is the objective described to gas engineers in Los Angeles recently by R. M. Conner, director of the American Gas Association Testing Laboratories.

► **Automatic Regulator**—He displayed a nine-ounce oxygen flow regulator that is wholly automatic, its operation controlled by barometric pressure, and said 25,000 units already have been installed in American bombers. Experimental installations in fighter planes were prompted by the discovery of similar equipment in a Messerschmitt brought to Wright Field four months ago, he said.

In the bomber installation, the regulator commences oxygen flow at 10,000 feet, delivering 98 cubic inches per man per minute, and steadily increases the flow to 148 cubic inches per man per minute at 30,000 feet.

► **Used in Hospital Planes**—A similarly light-weight regulator that can be operated from ground level on up has been developed for installation in hospital planes, in which some patients may need immediate oxygen treatment.

Conner credited W. R. Teller, chief engineer of the A.G.A. Laboratories' War Products Department, and E. G. Steffen, president of Alar Products, Inc., as leaders in the development of the device.

Gas Turbine Engine For Planes Discussed

The gas turbine engine may provide aircraft engines with ratings between 2,000 and 8,000 hp., Kenneth Salisbury, of General Electric's turbine engineering department, told members of the ASME oil and gas power division at the national meeting at Tulsa.

Salisbury warned, however, that the gas turbine at its present stage of development does not afford good fuel economy and that it has other drawbacks that must be overcome before it can be put in general use.

► **Use in Aircraft**—Regarding possible aircraft use, Salisbury said that "the lightweight internal combustion engine seems to be approaching a rather definite limit in rating. The gas turbine, on the other hand, just comes into its own in the sizes at which the gasoline engine seems to be approaching a limit."

SAE War Material Meeting Scheduled

Adaptations of aircraft-type structures to ground vehicles will be discussed before the National War Material Meeting of the Society of Automotive Engineers in Detroit early in June by Mac Short, engineering vice-president of Lockheed Aircraft Corp. Sessions will be held at the Book-Cadillac Hotel, Detroit, June 5, 6, and 7.

Relationship between practical post-war cars and aviation will be discussed by Consolidated Aircraft's W. B. Stout and by Brooks Stevens, Milwaukee industrial designer.

► **Production Methods**—Of further interest to aviation engineers will be discussions by M. M. Holben, of Wright Aeronautical Corp., on the subject of aircraft engine production methods and V. C. Young, of the Wilcox-Rich division of Eaton Manufacturing Co., on lessons learned from aircraft engines applied to heavy-duty ground-vehicle engines.

Glass-Reinforced Fuselage Tested

Plastic unit said to be 50 percent stronger than metal and 80 percent stronger than wood.

An Army basic trainer, equipped with a glass-reinforced plastic fuselage, side panels and tail cone, has been successfully flight tested at Wright Field, Owens-Corning Fiberglas Corp. reports.

The fuselage is estimated to be 50 percent stronger than a metal fuselage on a strength-weight basis and 80 percent stronger than the wooden fuselage now being used. Firing tests indicated the glass-reinforced fuselage would be satisfactory under gunfire. High explosive projectiles failed to detonate because of the low density of the material, which did not flower.

► **Has Balsa Wood Core**—The experimental fuselage consists of a balsa wood core between an inner and outer skin of plastic reinforced with fibrous glass cloth.

Further experiments may prove the new plastic practical for production processes and answer the need for a high-strength, lightweight plastic material that can be molded into intricate shapes without high pressures, high temperatures or expensive molds.



INDIA TAKES DELIVERY ON DIVE BOMBERS:

This camel-drawn cart probably got more attention from American troops than the stripped Vengeance dive bombers in the background. The planes, built at Consolidated Vultee's Nashville plant, are towed

through the streets of an Indian city after being unloaded from freighters. They are en route to a base for assembly and conditioning for combat against the Japs in Burma.

Martin Employee Designs Chip Saver

An ingenious compressed air attachment that saves the labor of one man at extrusion milling machines and segregates scrap is be-

ing used at the Glenn L. Martin plant in Baltimore to remove chips from the milling machines.

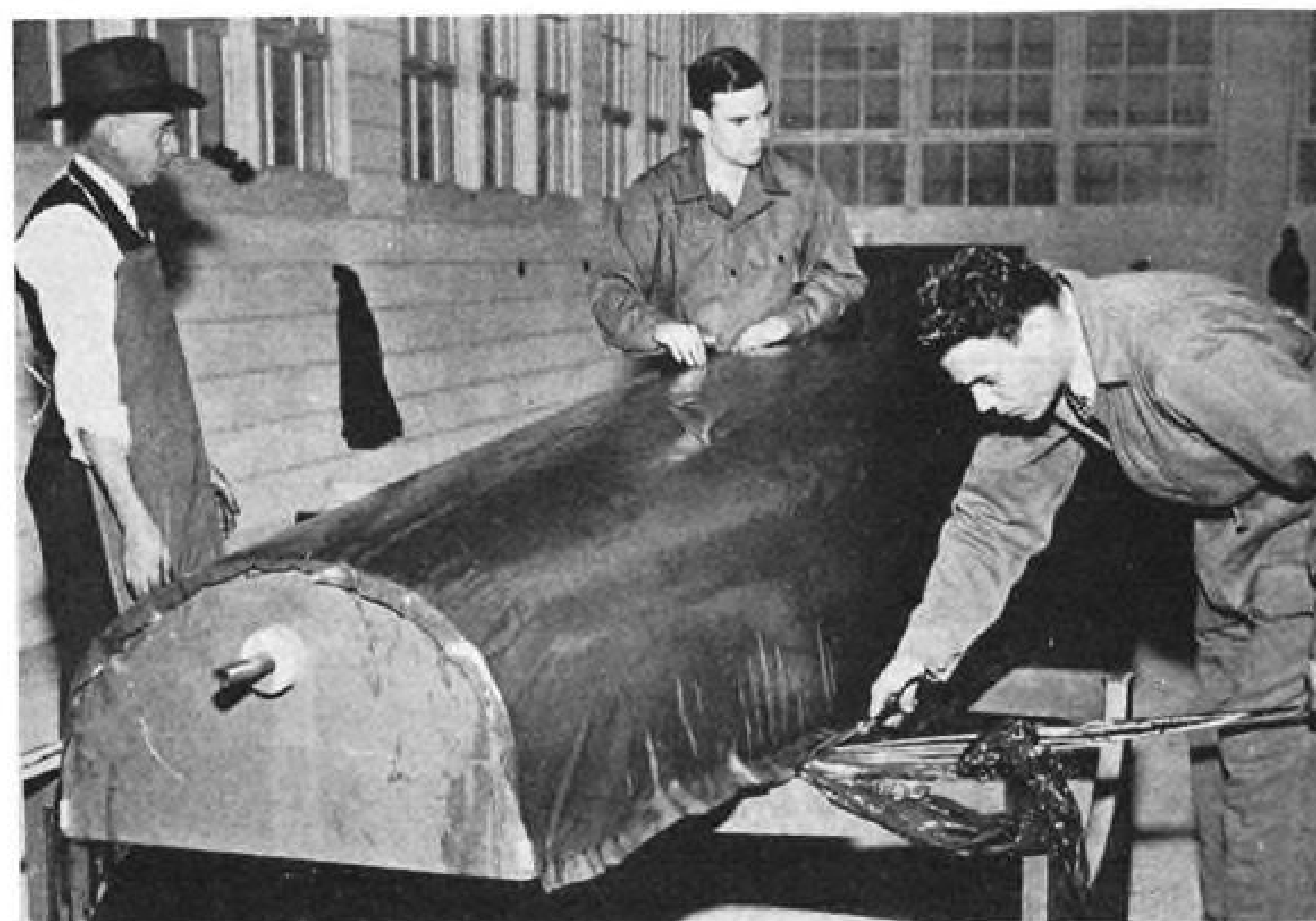
The equipment was designed as a result of employee suggestions, and consists of twin jets of air directed on each side of the cutter to carry chips into a duct and from

the duct into a portable receptacle. Martin officials say the attachment keeps chips from the floor and keeps them from being contaminated with dirt or chips from other kinds of metal.

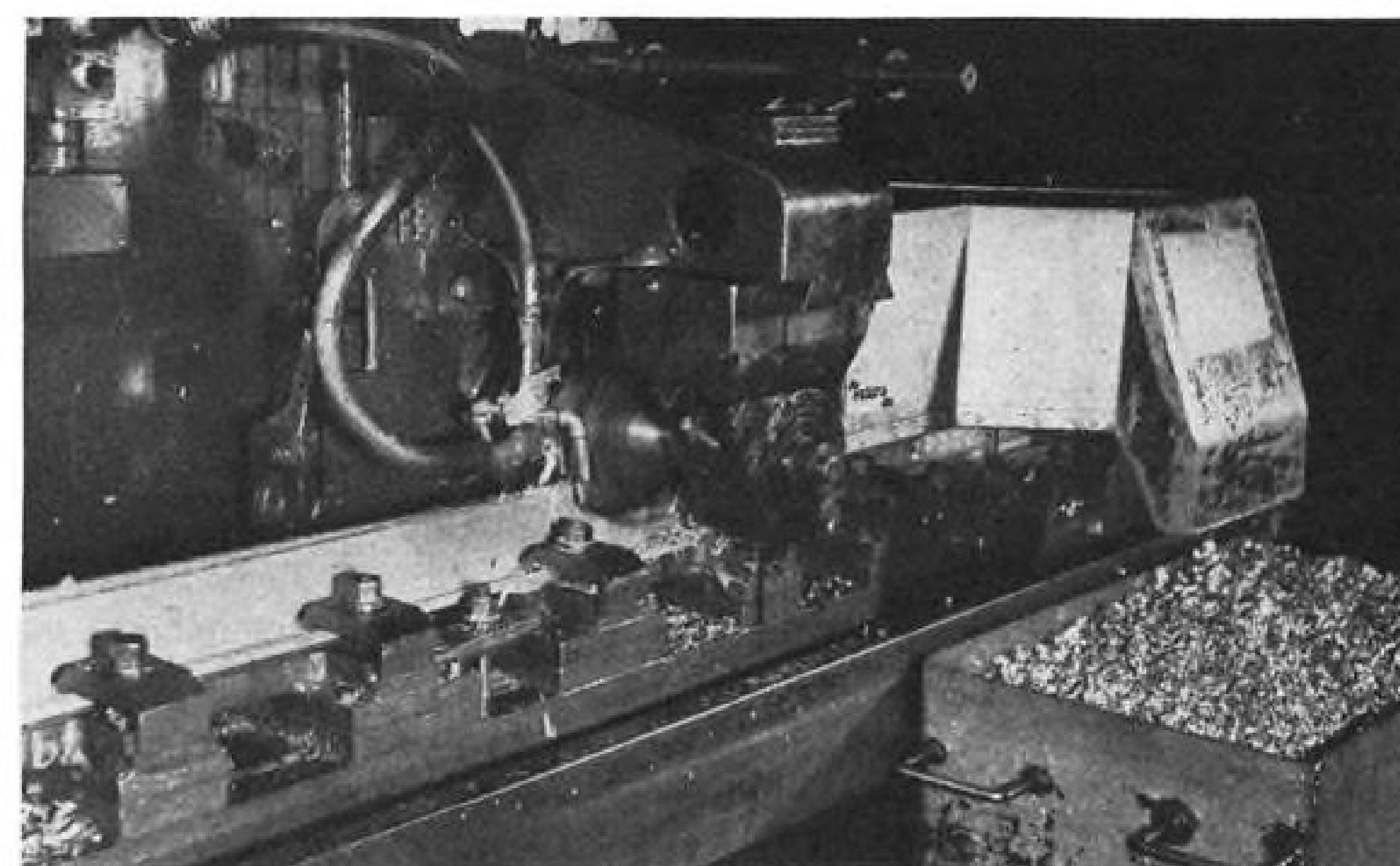
Navy Patrol Bombers Use New Type Heater

Navy patrol bombers and the giant Mars transport are being equipped with a new combustion type aircraft heater burning gasoline from the plane's tanks, according to the Heating Division of the Anchor Post Fence Co., Baltimore.

Automatic transfer from cabin heating in flight and on the surface is one feature of the new type heater, it was said. The heater is used to defrost the pilot's and bombardier's windows and for preheating engines in arctic temperatures. Company officials say it has functioned properly at temperatures as low as 72 degrees below zero and at altitudes up to 40,000 feet. Using about the same amount of electricity as the average reading lamp, it has an hourly output of 90,000 BTU in flight.



Fabricating Glass-Plastic Fuselage. Plies of glass cloth impregnated with resin are laid over a male mold. The plies, comprising a complete half of the fuselage skin, are trimmed before transfer to female mold.

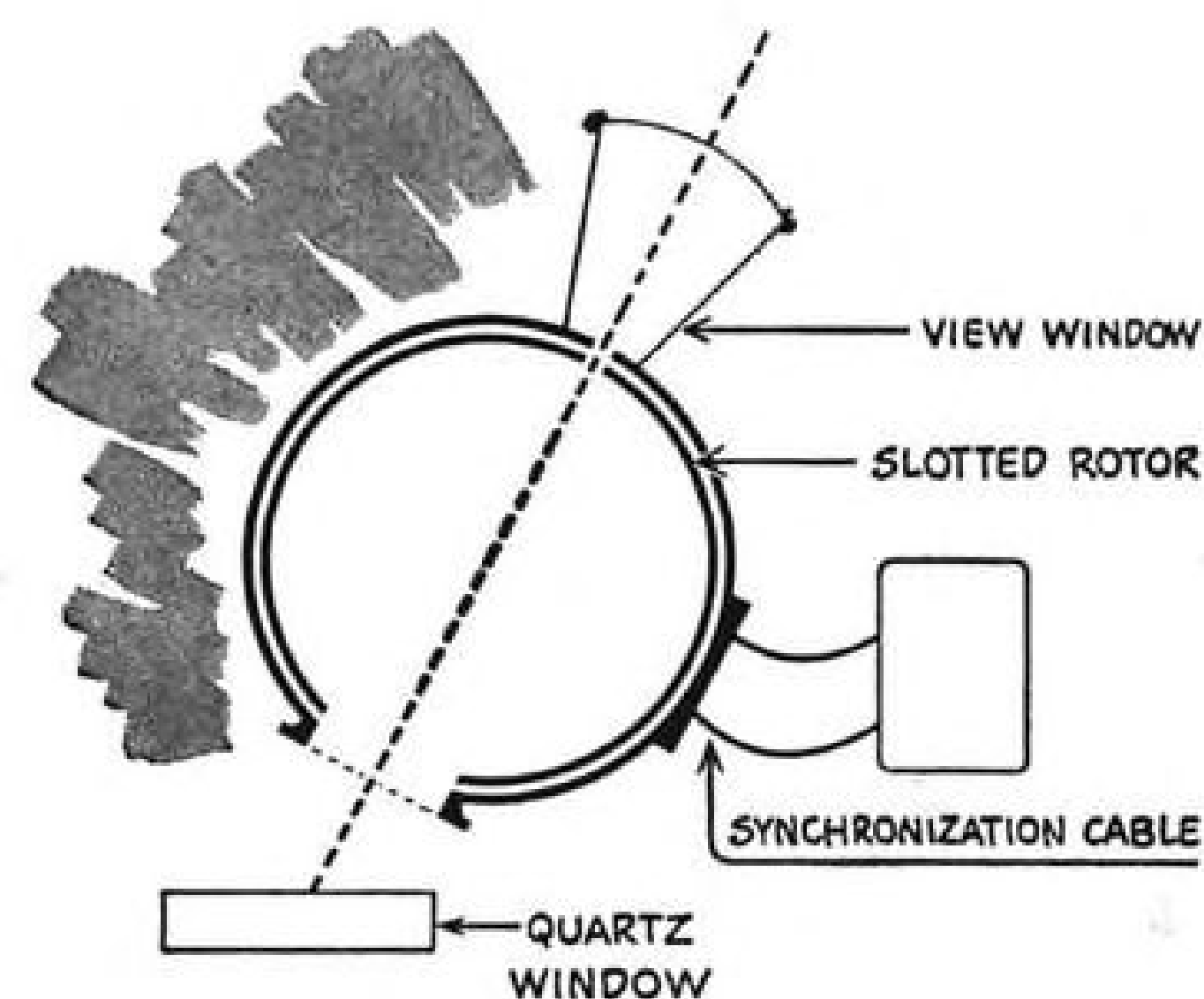
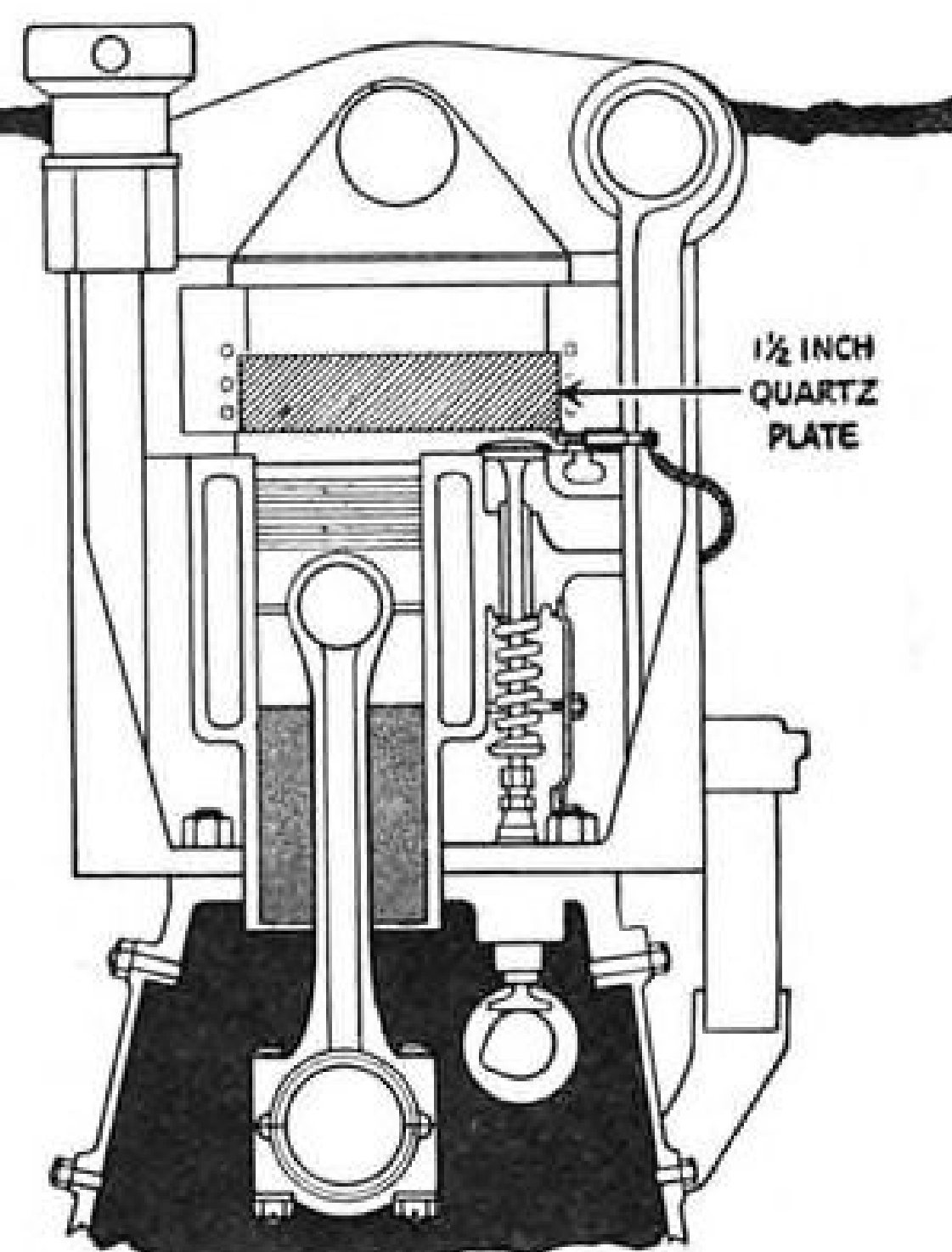


Chip Saver in Action. The compressed air lines at left force chips from this extrusion milling machine at the Glenn L. Martin Baltimore plant into the ducts and out into the portable receptacle at right, saving the labor of a man and facilitating scrap salvage of the metal.

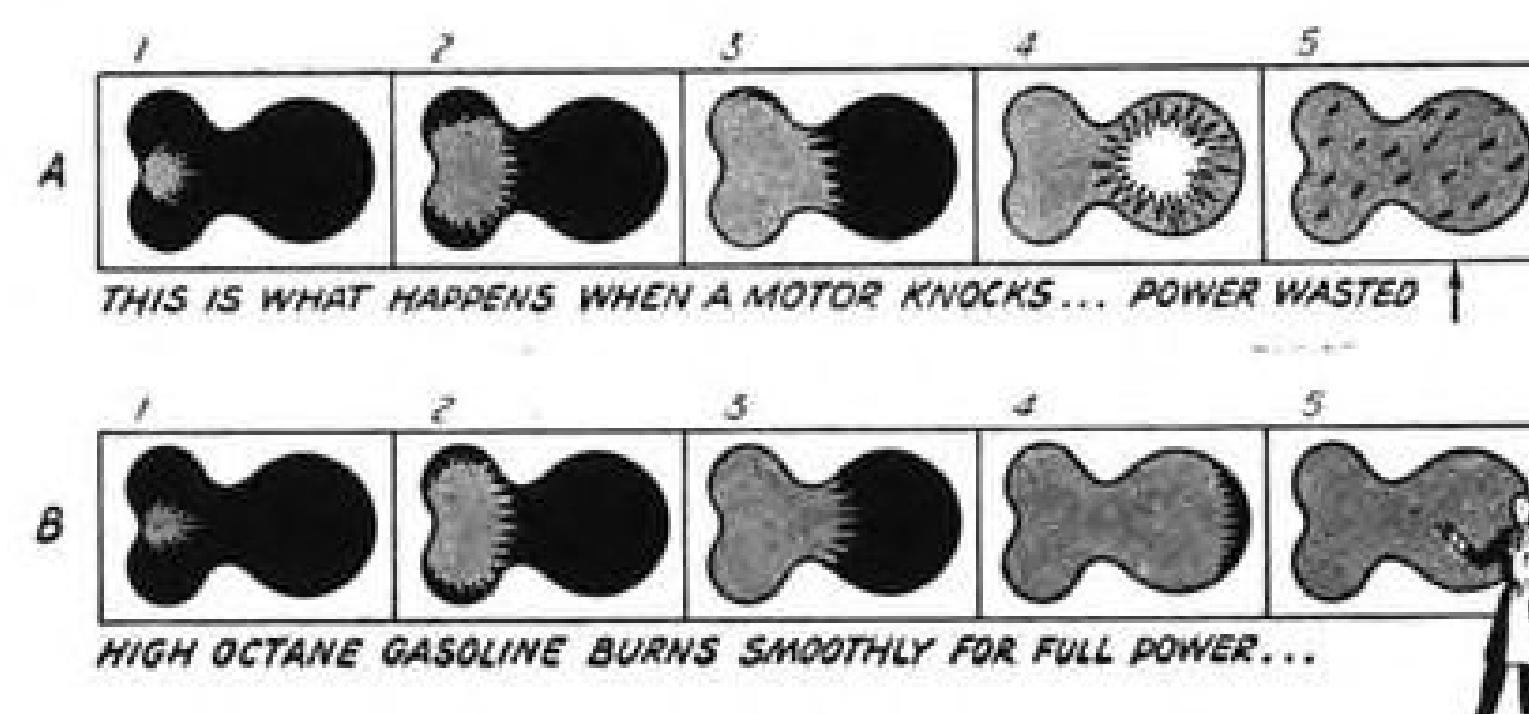


How we "freeze" flames to make hot airplanes

Aircraft engines run on flames from ignited gasoline. And how the flames burn determines how efficiently the engine performs. If the air-fuel mixture in the combustion chamber burns evenly and smoothly, far greater "push" is exerted on the cylinders than if it explodes quickly and sharply. Taming these explosions in high-compression engines is largely a matter of controlling the detonation characteristics of fuels. To see these new fuels in action, to learn how to improve them, Standard of California scientists developed this engine. It has a quartz plate in the cylinder head so that the actual combustion of test gasolines can be studied.



To "freeze" the flames, to apparently slow down the combustion process so that it can be studied, Standard scientists synchronized this stroboscope with the glass-topped engine. Through a slit in the stroboscope's whirling rotor one phase of the combustion process is viewed in successive explosions, giving the appearance of a continuous picture. Or it can be adjusted to follow the entire process like a slow-motion movie. Thus scientists can actually see how experimental fuels perform.



This is the biography of an explosion, what a Standard scientist sees through the stroboscope. Notice the violent explosion in frame A-4. This is knock, or detonation. Such violent explosions may dampen power, ruin engines. Equipment like the engine with the window in its head enables Standard scientists to improve aircraft fuels so that detonation can be avoided. With new Standard super fuels, flying combat teams get maximum speed and power from their motors—and designers can blueprint even more powerful and efficient engines for the sky giants of tomorrow.



STANDARD OF CALIFORNIA

TRANSPORT

TWA Buys Hawaiian Line Interest In 2d Overseas Expansion Move

Acquisition of 20 percent of shares announced simultaneously with cancellation of own application for route to Hawaii in favor of smaller company's request.

By MERLIN MICKEL

Transcontinental & Western Air, through purchase of a 20 percent interest in Hawaiian Airlines, Ltd., has taken the second cautious step toward entrenching itself in areas outside continental United States where it sees possibilities for strong aviation development. Cash involved was between \$300,000 and \$400,000.

TWA at the same time withdrew its own application for routes between Hawaii and the mainland in favor of a similar application by the smaller airline.

► **Bought TACA Interest**—First of TWA's deals of this nature outside the United States took place a little more than six months ago, when TWA disclosed it had bought for \$1,300,000 a substantial interest in TACA, important South and Central American operation.

The newest move was described in a joint announcement by Jack Frye, TWA president, and Stanley

C. Kennedy, president of Hawaiian, as furtherance of TWA's policy of minority participation in "certain leading, established and well-managed companies" outside the United States.

► **Overseas Domestic Operation**—It could also be taken as further evidence that operators in continental United States do not intend to be restricted by continental confines, regardless of whether post-war national aviation policy calls for competition or a chosen instrument in international operation. The proposed routes between the United States and Hawaii, however, do not rate as an international operation. Because Hawaii is a territory, they constitute an overseas domestic operation.

TWA's latest move, coupled with its declaration of policy, raises the question of what its next step will be. Despite official silence, it is known to have a number of nego-

tiations in prospect along these lines. Furthermore, these are understood to be elsewhere than Mexico or Central or South America, where TACA is in the field.

► **Atlantic Aspirations**—In light of the Hawaiian acquisition, this would point to the Atlantic, since TWA has ambitions to extend its commercial operation to Europe and to Cairo. Applications are on file with the Civil Aeronautics Board for routes that would carry TWA both from east coast cities and interior cities to London and Paris and Cairo via the Azores. Eventually the company hopes for certification to China. TWA hopes that Hawaiian will be granted the route it asks between Honolulu and Los Angeles, a distance of 2,591 miles. Hawaiian, which has been operating in the islands for 15 years, is expected to be of valuable aid as a feeder if its application is granted. The TWA connection can be expected to make Lockheed Constellations available for the proposed overseas operation, and Hawaiian in addition will have the benefit of personnel and experience in overwater flying, TWA's long suit is in its Inter-Continental Division.

► **Preferential Traffic**—TWA has no oral or written agreement with Hawaiian for preferential traffic, but believes any benefit from its operation to the mainland would accrue as well to other lines serving Los Angeles. Moreover, TWA does not look on Northwest Airlines' proposed route from Seattle to Honolulu as competition for the Honolulu-Los Angeles run, and thinks it should be granted.



ON AAF AIRWAY TO ALASKA:

This log Administration Building, operated by Royal Canadian Air Force, is used by the U. S. Army Air Forces at Watson Lake on the Northwest Staging

Route (Alaska Airway) in northern British Columbia. Its frontier-like appearance is a sharp contrast to the conventional airfield administration building.

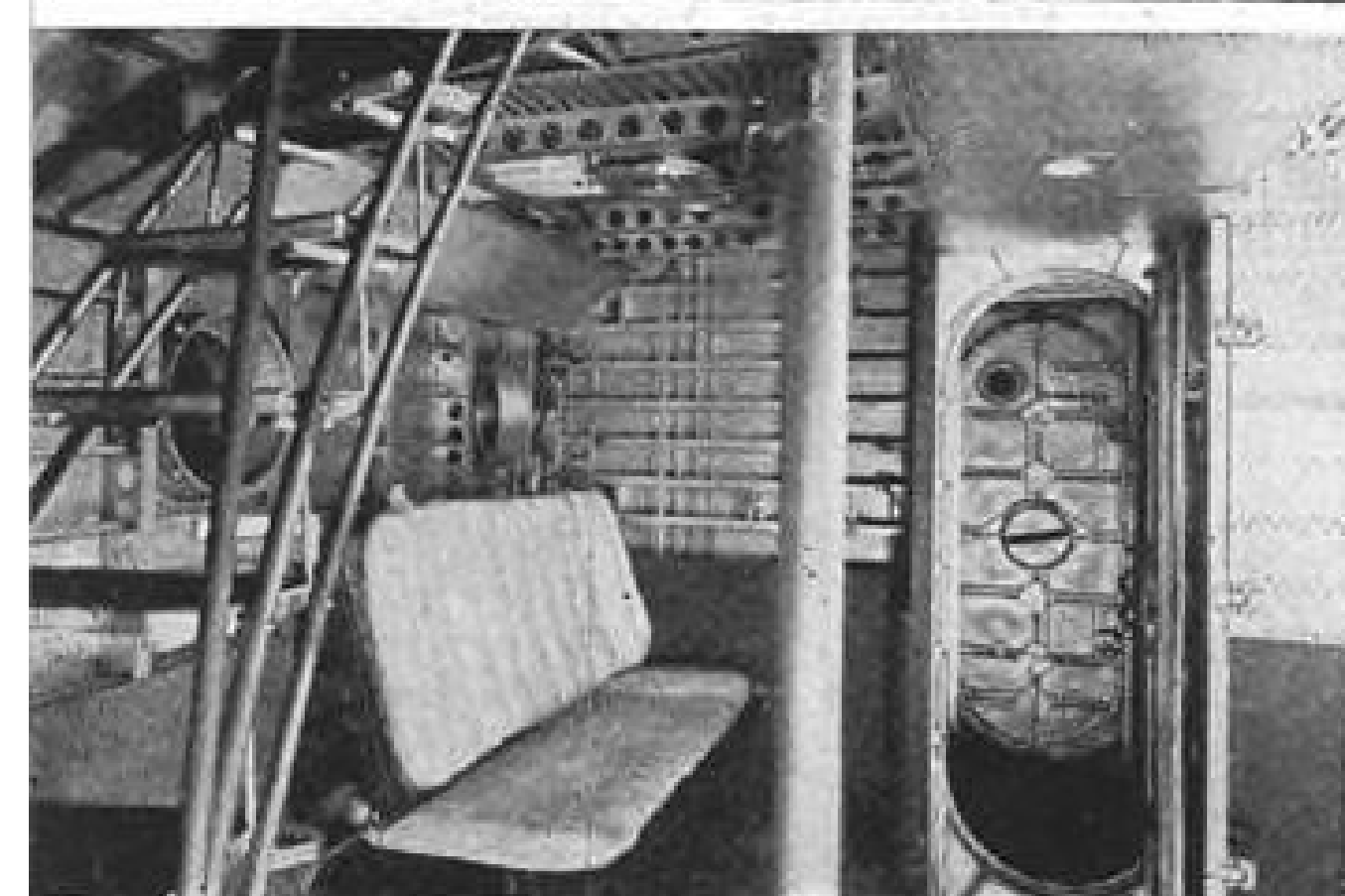
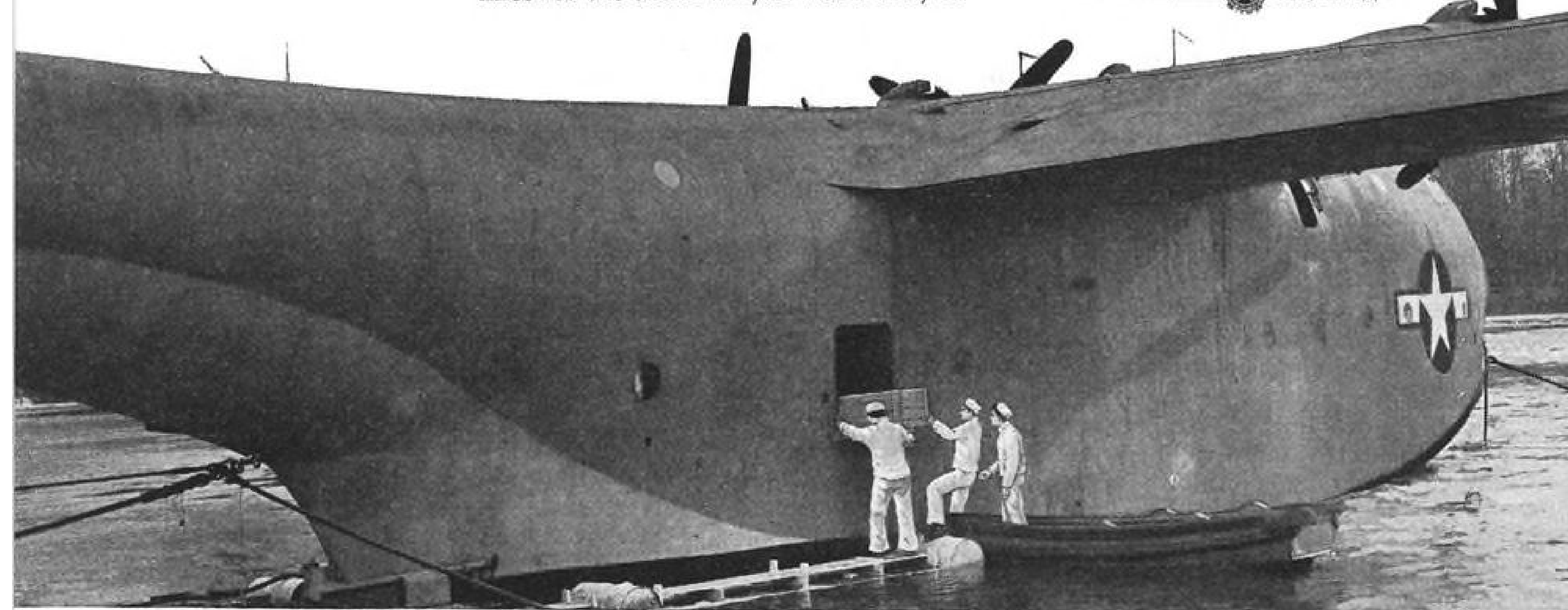
Answer to an Airline's Prayer... The Martin Mars Transport!

In the 82-ton Mars transport, postwar airline operators will have no visionary, untried design, no hastily converted bomber. Instead, they will have a successful type, thoroughly tested in over-ocean transportation. The 20 sister-ships of the original Mars are being built from the ground up as transports. Only more elaborate furnishings are needed to change them into luxury liners. More important, production lines for the JRM will, at war's end, be

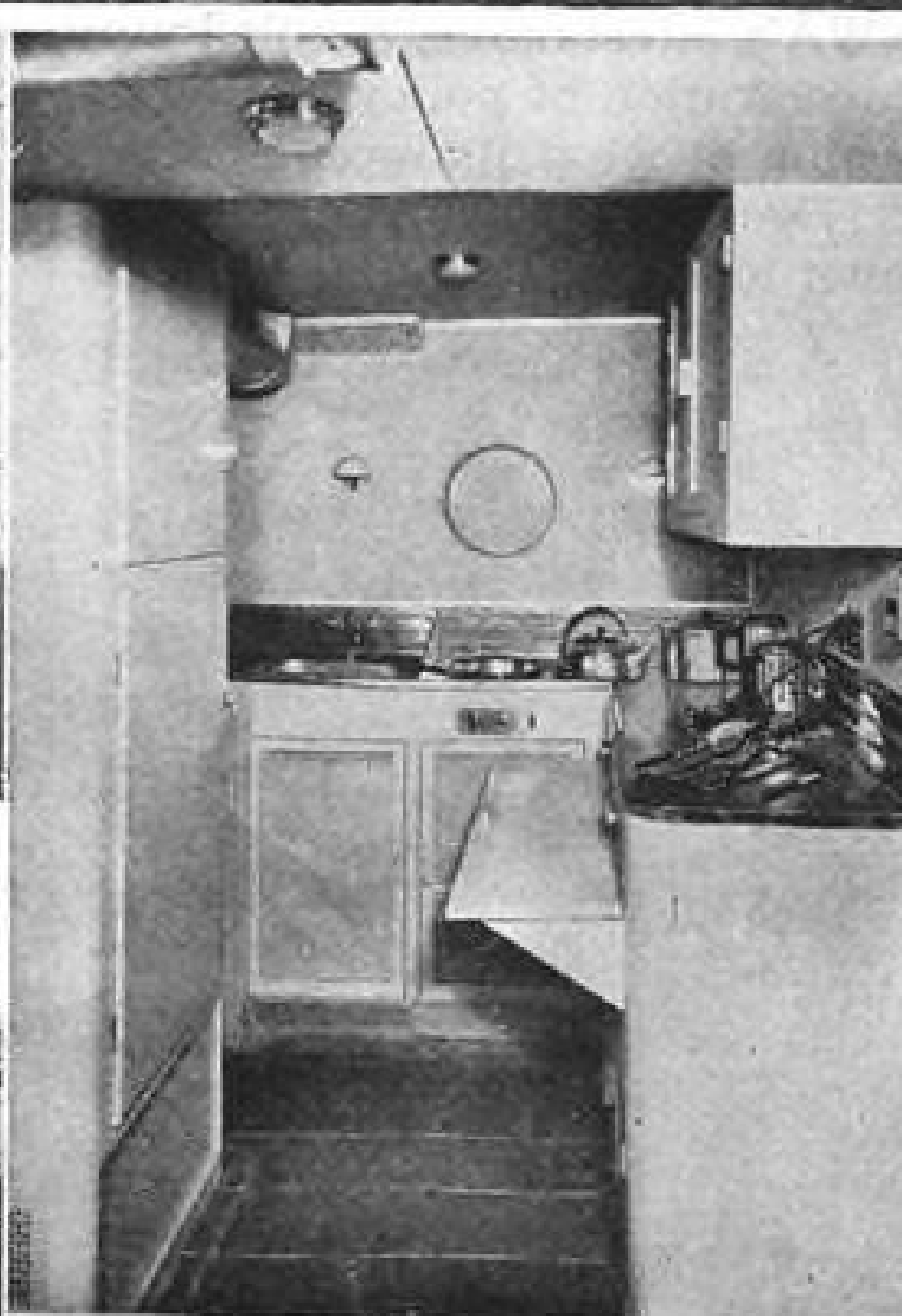
completely tooled and manned by experienced workers. This means fast delivery of commercial versions in tomorrow's swing toward supremacy of the skyways. For information, write THE GLENN L. MARTIN CO., BALTIMORE-3, MD. GLENN L. MARTIN-NEBRASKA COMPANY—OMAHA

Martin
AIRCRAFT

Builders of Dependable Aircraft Since 1909



RUGGED STRENGTH is demonstrated by the heavy, ship-type door separating the many water-tight compartments of the Mars. Most prospective airline passengers prefer the safety of flying boats for ocean flights.



ROOMY GALLEY . . . only one end shown in this photo . . . is marvel of compactness. Facilities include refrigerator, electric range, running water. Complete meals for many passengers may be prepared here. The Mars also boasts steam heat, air conditioning, showerbath, 110-volt electrical facilities.



SLEEPING ACCOMMODATIONS of JRM are comfortable but plain. Luxurious fittings and decorations will be installed in commercial versions. Refurnished, this cabin would compare with those on ocean liners.



CONTROL CENTER of the Martin Mars, as seen from the pilot's compartment, shows captain's desk, radio operator's panel, plus accommodations for navigator and flight engineer. Stairs at the left lead to deck below.

Half a dozen applicants are on file for these routes half way across the Pacific. In addition to Hawaiian, Northwest, United Air Lines and Western Air Lines among the operating companies, applications have come from Matson Navigation Co. and Ryan School of Aeronautics. United filed on the day TWA withdrew.

► **Controlled by Ship Line**—Until TWA made its purchase, in which about 8000 shares of stock changed hands, 88 percent of Hawaiian's stock was owned by Inter-Island Steam Navigation Co., Ltd. Kennedy is also president of the steamship company. The relationship which finds the steamship company in control of an airline has continued because Hawaiian's operation has been conducted under a "grandfather certificate." Nevertheless, if Hawaiian receives a route to the West Coast, the plan is that Inter-Island will divest itself of its control, stock aside from TWA's 20 percent going to independent shareholders including those who now own equities in the steamship company.

It is doubtful that TWA will hold the largest block of stock, despite this distribution. Kennedy and other officers in the company may be expected to purchase a larger block, since there is a desire both to retain them in their present positions and preclude any question of control.

► **1943 Revenues Up**—Hawaiian reported for 1943 a net profit of \$132,053 after deductions of \$308,533 for territorial, federal income and excess profits taxes. Operating revenues amounted to \$1,613,073, a 19.24 percent increase over 1942. Passenger revenue was up \$176,953 and freight \$128,593.

Hawaiian ranked fourth in January among the domestic airlines in carriage of express and air freight, with a total poundage for the month of 514,775. In 1943, it carried 108,114 passengers, an increase of 31.04 percent over 1942. Operating revenues last year came 77 percent from passengers, 17.52 from air freight and express, 3.56 from excess baggage, 0.95 from air mail, and 0.97 from miscellaneous sources.

Pan American is the only carrier presently certificated to fly from the continent to Hawaii. United and Consairway fly the trip under war contract, and it is of course a frequent operation by the Air Transport Command and Naval Air Transport Service.

C&S Recommended for Route Linking Detroit and Memphis

Report of Examiners Wrenn and Ruhlen would permit completion of long leg in direct border-to-border air service.

Completion of a long link in direct border-to-border air service between Detroit and New Orleans is proposed in a report by Civil Aeronautics Board examiners recommending that Chicago and Southern, one of the smaller airlines, be certificated for a route from Memphis to Detroit.

The report on Detroit-St. Louis-Memphis consolidated cases heard by Examiners Thomas L. Wrenn and F. Merritt Ruhlen accedes partly to requests for additional stops by two of the major lines and two smaller ones. The former are American Airlines and Transcontinental & Western Air, the latter Chicago and Southern and Mid-Continent. Applications by Eastern Air Lines and United Air Lines, the two other "big four" operators, are recommended for denial.

► **Direct Service**—Direct service would be provided for the first

time between Toledo and Indianapolis via Fort Wayne and Muncie, Ind., to serve the highly-industrialized northern Indiana area. They also would link Evansville, Ind., and Memphis, Tenn., with a direct route for the first time. At least two cities—Paducah, Ky., and Muncie—would thereby receive their first air service.

Selection of Chicago and Southern for an important segment of the routes proposed would strengthen that line "without adversely affecting other carriers." Establishment of service by Chicago and Southern from Detroit to Memphis, Wrenn and Ruhlen say, "would make available a single-carrier operation from the great industrial center of Detroit to the Port of New Orleans and to southeastern Texas points between which there is a great community of interest."

► **Memphis-Houston Link**—Chicago and Southern already connects Memphis with Houston on AM 53 and New Orleans on AM 8, the latter running virtually straight south from Chicago. CAB's acceptance of the recommendations would add 662 miles to its route structure.

The proposed extension of the line's AM 53 to Detroit from Memphis would be via Paducah, Evansville, Indianapolis, Anderson-Muncie-New Castle, Fort Wayne, and Toledo. The line also had asked certification between St. Louis and Detroit and Cleveland via Terre Haute, Indianapolis, Anderson-Muncie, Fort Wayne and Toledo, but this was recommended for denial.

► **American Gets Extension**—For American, the examiners recommend extension of AM 21 from Cleveland to St. Louis, via Fort Wayne, Anderson-Muncie-New Castle, and Indianapolis, on condition, however, that flights between Indianapolis and St. Louis originate or terminate at or east of Cleveland. American asks a certificate also between St. Louis and Detroit and Cleveland via Springfield, Ill., Indianapolis, Anderson-Muncie-New Castle and Fort Wayne, Ind.

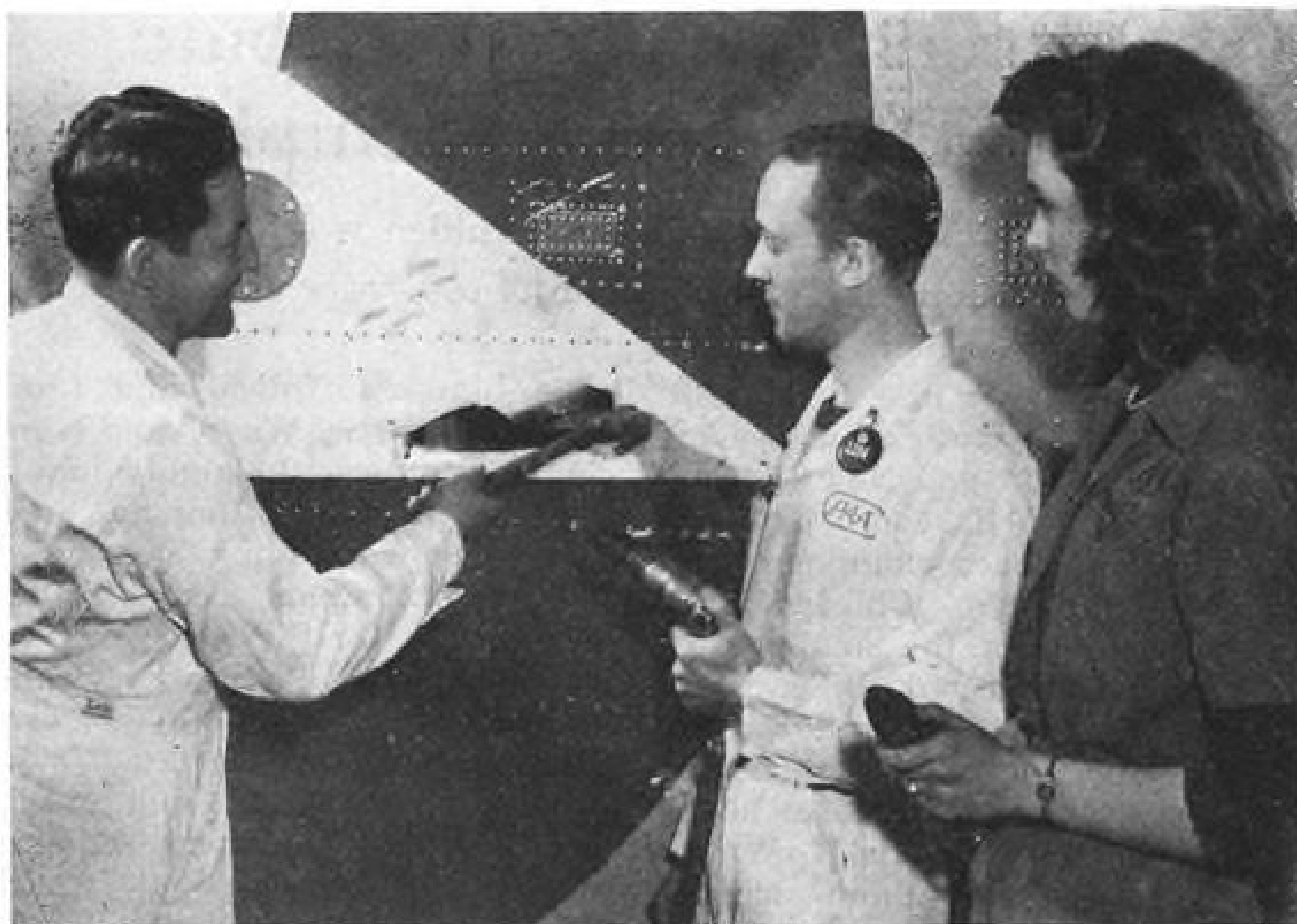
Mid-Continent's request for per-



CONSTELLATION CACHETS:

First flight covers from the Constellation's trip from Burbank to Washington have been turned over to the New York Chapter of American Red Cross for auction or sale in New York's Red Cross War Fund drive. The special cachets are postmarked Los Angeles 2 a.m., Apr. 17 and Washington National Airport 2 p.m., Apr. 17, an elapsed mailing period of nine hours. In the picture, A. D. Williams, Jr., TWA's New York District traffic manager, gives a handful of the envelopes to Mrs. Lewis W. Douglas, director of the New York chapter's fund raising service.

VISUALIZE THIS CORNER, smartly redecorated, on a commercial version of the Mars-type transports. Trans-ocean passengers would find it ideal for meals, games or a pleasant chat. This is a real flying ship!



PAA GIVES PATCHING TESTS:

Pan American Airways' La Guardia Field terminal is probably the only place in the country where plane parts are purposely damaged so repairs can be made. A wing section is punched and then patched as a test for mechanics leaving for foreign station. Showing how it's done are Charles Hervish, metal shop instructor, with the hatchet, and Jack Breza and Evelyn Leek, metal shop employees, with rivet gun and shears to apply the patch.

mission to extend AM 48 from Kansas City to St. Louis via Columbia, Mo., if granted as the examiners propose, would constitute the base of a triangular route with Des Moines at the apex, although 48 extends north from the Iowa capital. MCA also serves Omaha on AM 26. Both routes go to St. Paul-Minneapolis, and 26 goes south to Tulsa. However, Wrenn and Ruhlen did not approve this line's request for a route between St. Louis and Detroit and Cleveland via Decatur and Danville, Ill., Lafayette, Ind., Indianapolis, Fort Wayne, Ann Arbor, Mich., and Toledo.

► **Terre Haute Stop**—The examiners propose that TWA's temporary stop at Terre Haute, Ind., between Indianapolis and St. Louis on transcontinental AM 2 be made permanent. In addition, TWA asks a certificate between Indianapolis and Detroit and Cleveland via Anderson-Muncie, Marion, Fort Wayne and Toledo, but this is recommended for denial.

In the applications by the two other big air carriers that fail to get the examiners' sanction, Eastern wants a certificate between Memphis and Detroit via Paducah, Evansville, Terre Haute, Indianapolis, Anderson-Muncie-New Castle, Fort Wayne and Toledo, while United seeks authorization

between Detroit and Cleveland and Omaha via Toledo, Fort Wayne, Anderson-Muncie-New Castle, Indianapolis, Terre Haute and St. Louis, and also via Toledo and St. Louis.

It was considered likely that TWA, American and Mid-Continent could serve the additional routes suggested by the examiners with their present equipment. Whether Chicago and Southern would be able to operate its recommended extension was more in doubt.

Gets Athens Stop

Application by All American Aviation to serve Athens, Ohio, as an intermediate point on AM 49 has been approved by the Civil Aeronautics Board. The point was added to All American's route because of increased use of airmail in Athens.

As the result of a recent mail count, the Post Office Department had requested that a carrier be authorized to perform this service. The count showed a 657 percent increase in airmail from Athens since 1940.

► **Improves Service**—The new service authorized will improve delivery of airmail from Athens to Cincinnati, Pittsburgh, Washington and New York.

U. S.-Canada Route Hearings Started

Certification of any of eight applicants believed distant because of international aspect.

Civil Aeronautics Board examiners have started hearings on U. S.-Canada route applications, but because of their international aspect, any certification probably is distant. If new routes over the border are placed in operation, the temporary nature of the reciprocal agreement between the two countries, which can expire six months after the war, might be expected to give them the same degree of impermanence.

As in all cases involving foreign air routes, these would have to be cleared through diplomatic channels of both governments before they could start operation.

► **Landing Rights Not Involved**—While the Civil Aeronautics Act requires hearings on all applications, it is not necessary that possession of landing rights be shown.

In the American Export case, the U. S. Circuit Court of Appeals said: "The acquisition of landing rights is dependent on negotiations between this government and the foreign government concerned and involves matters peculiarly within the field of executive discretion. . . . The possession of landing rights is not required in order to obtain a certificate of public convenience and necessity."

► **Sought by Eight Lines**—Eight carriers are attempting to show the need for new and additional service between New York, Philadelphia, Baltimore and Washington, and points in Canada.

PCA, United, Eastern, American and Colonial and three newcomers, Page Airways, Hylan Flying Service and Union Airways are involved.

Colonial asks to connect Massena, N. Y., with Ottawa and Montreal, and to operate between Burlington, Vt., and Ottawa. They also seek Massena-New York-Washington via Watertown, Syracuse, Endicott, Johnson City and Binghamton, N. Y., and York, Lancaster and Harrisburg, Pa.

► **Extension Sought**—American seeks to extend AM 7 south to include Allentown-Bethlehem and Philadelphia and north to Ottawa from Syracuse and to Montreal from Syracuse via Watertown and Massena.

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Pennsylvania Central Airlines completes 17 years of progress



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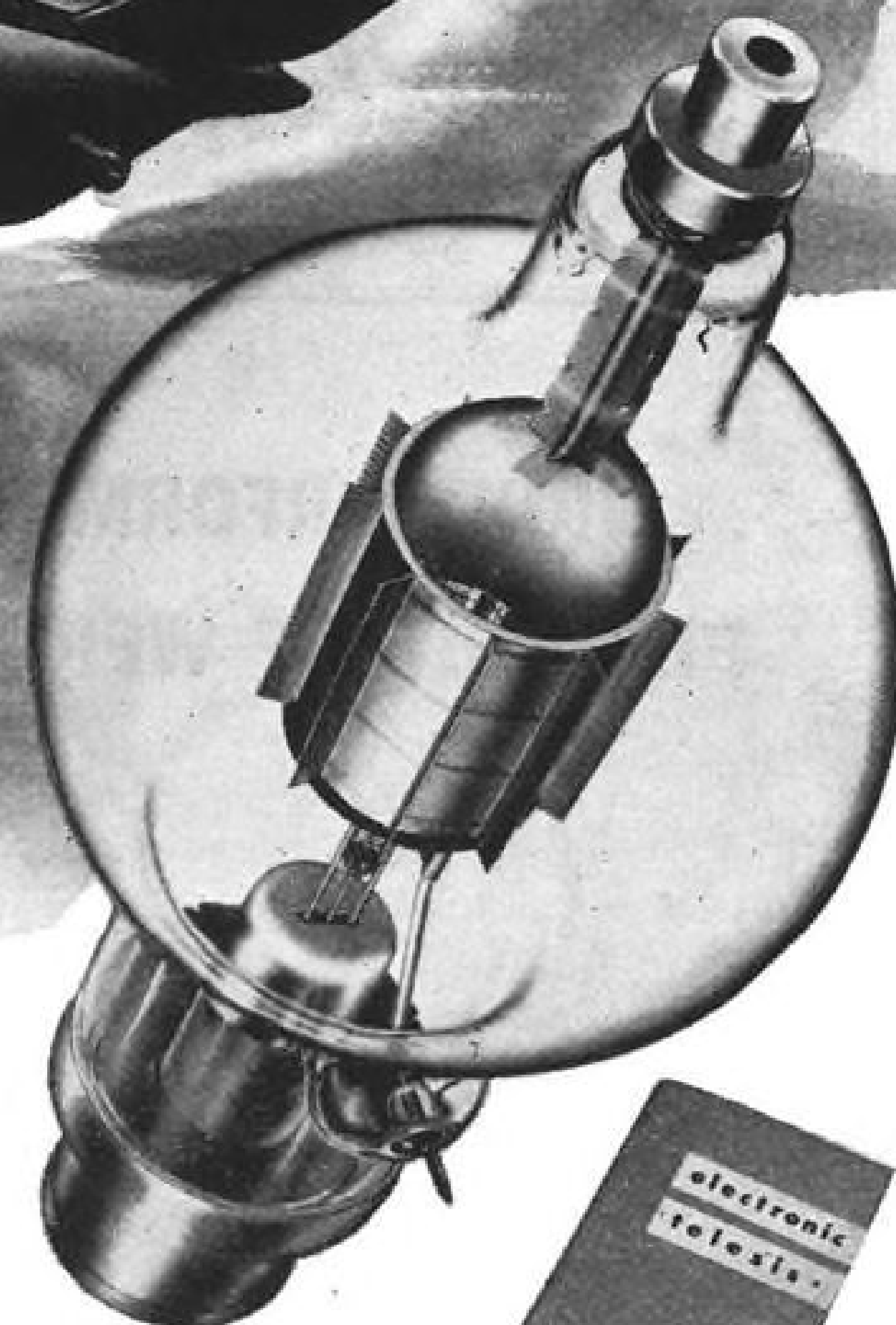


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As with all commercial aviation, radio communications has played a vital role in the progress of PCA. Eitel-McCullough, Inc., salute Pennsylvania Central Airlines on their 17th anniversary with great pride in the fact that Eimac tubes occupy the key sockets in PCA ground stations throughout the system. A fact which in some measure, has helped Eimac to become first choice of leading Electronic Engineers throughout the world.

Mr. E. Raymond, Chief of Ground Station Maintenance, says: "PCA has in operation at the present time approximately one hundred and fifty Eimac tubes of various types. During the past five years, the dependability and long life of these tubes has promoted our confidence and consideration in recommending their incorporation in new equipment wherever possible."



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CAB Starts Work on Coast Applications

Action begun with prehearing conference; 23 carriers involved.

Civil Aeronautics Board has commenced action on a large group of applications requesting air carrier service in the West Coast area with a pre-hearing conference before CAB Examiners Brown and Ruhlen.

Twenty-three applicants are included. The lead docket is an application filed by Oregon Airways, Inc., in May, 1939.

Consolidation Discussed — Consolidation of the various applications into one proceeding was discussed at the conference. John W. Foreman, whose application includes a Chicago-San Francisco route which would not be considered in a consolidated proceeding, was the only strong objector. Greyhound Corp. also indicated it might not approve consolidation.

In line with CAB policy, the examiners discouraged the calling of city witnesses when hearings are held, inasmuch as 400 communities are listed in the applications. **Justice Dept. May Intervene** — Counsel for the Department of Justice was present at the conference and indicated the department might seek to intervene.

A majority of the counsel present said a hearing of the case on the

Meet in London

A group of international air traffic operators met in London last week for an unofficial discussion of aircraft and equipment possibilities for post-war operation.

The State Department took no official notice of the meeting. Some sources commented privately, however, that they thought its effect on the actual post-war situation would be negligible.

American Export Airlines was the only United States carrier represented.

West Coast seemed preferable, but the time and place have yet to be announced.

Applicants include: American Airlines; Northwest Airlines; TWA; United Air Lines; Western Air Lines; Oregon Airways, Inc.; West Coast Airlines, Inc.; Southwest Airways Co.; Greyhound Corp.; Engel Air Feeder Lines; Coast Aviation Corp.; North Coast Transportation Co.; Pacific Northwest Airways; Washington Motor Coach Co.; Landon Lawson Clevinger; Interstate Airlines, Inc.; Oregon Motor Stages; Albert L. Zimmerly; Roy F. Owen Co.; Bremerton-Tacoma Stages, Inc.; John W. Foreman; Interstate Transit Lines, and Nevada Pacific Airlines, Inc.

Canada Air Group Asks Flight Strips

Aeronautical Institute seeks to revise regulations to make jobs for war veterans.

Necessity of having Canadian air regulations changed to allow building of landing strips for feeder airlines and private planes to give post-war employment to returning air force personnel highlighted the first national conference of the Aeronautical Institute of Canada at Toronto last week.

American and Canadian aviation experts told municipal and provincial representatives among the more than 300 at the sessions how to build and finance the air strips for communities not now served by airports.

Patterson Tells of Plan—More than 100 municipalities and eight provincial governments were represented at the two-day sessions. Representatives of the Canadian, British, Polish, Norwegian and Czech air forces, and aircraft and accessory manufacturers also attended.

C. R. Patterson, president of the Institute, described his visits to 80 Canadian communities during the year, outlining proposals whereby the municipality, province and federal government would each bear one-third of the cost of



AMERICAN USES SALES TACTICS TO GET EMPLOYEES:

American Airlines is using a ground floor show room in the Pershing Square Building, New York City, to sell the public on working for an airline. Pictures show the display window of the employment office and the interior of the "screening" room where



prospective employees receive their first interviews. The sign in the window says "Women Stock Clerks Needed!" and the current display depicts a stockroom scene. Inside, upholstered theater seats add to the comfort of applicants while they await their turns.

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MILITARY MAPS AND AIR PHOTOGRAPHS

By A. K. Lobeck, Professor of Geology, Columbia University, and Wentworth J. Tellington, Captain, Cavalry; Instructor, Department of Military Topography and Graphics, United States Military Academy.

Here, in one volume, are all the techniques and practical applications of modern map reading presented in a clear and easily understood form. This book gives you the basic principles and fundamental methods of map reading—covers in detail important topographic forms—includes a section on advanced map reading and the problems of map reading in the field—and provides a complete factual approach to the visualization and understanding of landscape types. The last part of the book explains how to interpret air photographs and describes their uses in the field. 225 pages, 8½ x 11, 361 illustrations, \$3.50

NAVY IN THE SKY

By Wallace W. Elton, Lieut., U.S.N.R.

Here is a brilliant collection of official Navy and Marine Corps photographs carefully selected and arranged to form a comprehensive outline of naval aviation. Originally designed for use in naval indoctrination courses, it gives you in pictorial form the impressive story of Navy planes and blimps and the men who are operating them. A descriptive commentary explaining the various types of planes, their appearance, qualifications, and duties accompanies the photographs. This is a book that not only provides you with a complete introduction to naval aviation, but also gives you the best of the U.S. Navy photographers' art. 104 pages, 9¾ x 7¼, 128 photographs, \$2.00

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building the landing strips. He estimated that 400 communities would be equipped with landing strips as a post-war measure. The combined cost would total \$20,-000,000 and construction of the strips would give employment to returning airmen for construction of the fields and encourage the start of small feeder airlines, boost private flying and give employment in Canada's aircraft industry.

► **Favor Air Force Personnel**—The Institute is responsible for the government policy of holding applications for new airlines until after the war in order to give air force personnel a chance to own and operate lines.

Don Flower, of Cessna Aircraft Co., Wichita, Kan., described to conference members methods of building airstrips and told of the facilities that should be provided. J. D. Millar, deputy highway minister of Ontario, spoke on the relationship between landing strips and highway construction, and Leo Dolan, of the Canadian government travel bureau in Ottawa, told of the part landing strips would play in the post-war tourist business. American development of small landing strips was described by Charles E. Smith, of Aeronca Aircraft, Middletown, O.

► **Taxation**—Taxation of the aircraft industry was discussed at the session, and W. B. Burchall, of the Air Industries and Transport Association, Ottawa, described the general outlook for the Canadian aviation industry.

The Institute will soon launch a membership drive among municipalities and air force personnel.

Ayres Sees Drop In Air Freight Use

As the result of a survey of 800 representative shippers throughout the country, Brig. Gen. L. P. Ayres, economic adviser to the Chesapeake and Ohio Railroad Lines, has concluded that air freight charges probably will prevent many more than 50 percent of the shippers from using air transportation. He says present volume of air traffic is closely related to government-paid charges, and that the volume will correspondingly decrease when this aid is withdrawn.

The survey indicates that much present air freight consists of parts traveling to centers of production, rather than finished goods.

► **Sees Post-War Decline**—Once the

war-created urgency is removed, shippers will seek the cheapest method, rather than the speediest, General Ayres finds. He reported that only 7 percent of those contacted by the survey plan to make regular shipments by air.

Six Lines File For Route Permits

United seeks certificate for service to Hawaii.

United Air Lines applied to the Civil Aeronautics Board last week for a trans-Pacific route from California to Honolulu, a domestic route from Boise to Reno, and the addition of 21 new intermediate points on the lines' existing certificated routes in Washington, Oregon, California, Utah, Idaho.

The Hawaiian application seeks routes between San Francisco, Los Angeles and Honolulu. United said aircraft to fly this route are not now available. The Boise-Reno cut-off would connect points now served on United's AM 1 and speed service between the Pacific Northwest and California, the application said.

► **Western Air Lines** applied for a Los Angeles-San Francisco to Honolulu route, but does not own the aircraft it proposes to use in this operation.

A system of feeder lines designed to mesh many towns in Florida, Georgia, Alabama, Mississippi, and Louisiana is proposed in an application by National Airlines for three routes originating and terminating at Jacksonville.

► **American Airlines** asked permission to add Midland, Texas, as an intermediate point between Big Spring and El Paso, and Palm Springs, Calif., between Long Beach and San Diego, and requested authorization to offer local service between San Diego and Los Angeles now prohibited in its certificate.

All American Aviation asked CAB to add a new segment to its pickup route to link Washington and Harrisburg, Pa., via intermediate points.

► **U. S. Midnight Sun Air Line, Inc.**, of Whitehouse, N. J., proposed service to connect New York with Moscow, via points in Canada, Iceland, Norway, Sweden, Finland, and Russia. An alternate southern route would include stops at Bermuda, the Azores, Madrid, and Amsterdam.

CAB Backs National On N.Y.-Fla. Route

Refuses petition by Eastern, Colonial and Seaboard to reopen proceedings.

Civil Aeronautics Board, in a supplemental opinion, has reaffirmed the position it took in February when National Airlines was granted a route from Florida to New York, and has refused petitions of Eastern Air Lines, Colonial Airlines and Seaboard Airways to reopen the proceedings.

The Board refused Eastern's application to serve Norfolk, Wilmington, Elizabeth City and other coastal towns on the grounds that such authorization "would substantially increase that carrier's control of the air transportation through the area here in question." National's route was granted to establish a competitive service, and includes stops at Norfolk and Wilmington.

► **Seaboard Refused**—Application of Seaboard similarly was refused on the grounds that sufficient volume of traffic to support three trunk-line carriers between New York and Florida does not exist. Granting Seaboard's application would increase the competitive burden on National, which would be contrary to the Board's efforts to strengthen that small carrier in the air transport field.

The contention of Colonial that

by authorizing National to operate from Jacksonville to New York the Board had in effect authorized international air transportation was likewise dismissed.

"Under such a definition . . . all domestic air carriers would engage in foreign air transportation by means of connecting services . . . operating into the foreign field," the Board said.

Navy, San Francisco Agree on Port Deal

Navy has acquired Treasure Island in San Francisco Bay through a deal that gives San Francisco \$10,000,000 worth of Army and Navy improvements to Mills Field Municipal Airport.

Observers in the area, agreeing that the arrangement gives an answer to San Francisco's airport problems that Treasure Island could not provide, believe the transaction marks the beginning of an adequate post-war terminal for intercontinental commerce.

► **Agreements Signed**—The Island became Navy property when Federal judges signed two agreements in San Francisco, ending long-drawn litigation over acquisition of the 550-acre man-made tract, site of 1939 and 1940 international expositions.

In exchange for the title, the city receives the Mills Field improvements.



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The idea that our national security some day would depend upon the successful invasion of continental Europe by our armed forces was inconceivable to the average American but a few short years ago. Yet, today our whole strength is assembled to that very action and for assuring a sound and permanent peace.

America became great without aggression . . . without tyranny. Our greatness has been achieved without destroying others . . . ours is a history of unprecedented industrial progress, of development of our own resources and reliance on our own efforts.

Aggression is foreign to American philosophy. Yet, today we find ourselves faced with the choice of destroying or being destroyed. Today we are confronted by the hard fact that the kind of peace which we all so fervently desire can be achieved only by crushing autocracy and by removing the causes of aggression.

We are now engaged in the accomplishment of the first objective. Since Pearl Harbor a complacent, peace-loving America—the largest of the “soft” and “decadent” democracies—has grown strong and tough. Out of the inherent virility of

a free people we have moulded the mightiest force for invasion and attack that the world has ever seen.

We have reached our peak rates of war production. We are producing as much war equipment as all the rest of the world combined.

History will record our industrial mobilization as a phenomenal achievement.

The battle of production has been won!

The full might of our armed forces and those of our allies unleashed against the Axis war machine will bring eventual victory. Two and a half years of intensive preparation, backed by 168 years of growth as a free nation, has given us superiority over twenty years of painstaking preparation by the totalitarian and militaristic countries with their enslaved peoples.

Every American has contributed toward this powerful offensive. Our manufacturers and business leaders have exerted their fullest efforts. Our industries have mobilized their tremendous resources—tapped to the fullest degree their inventive and productive genius. The men and women in the factories, on the farms, and in the mills and mines have played a magnificent

part in the tremendous production program. Citizens all are making their contribution to the armed victory that lies ahead

We have demonstrated that a free people under a free enterprise economy can unite in a common purpose.

* * *

When the war is won, we shall be faced by our second objective . . . removing the causes of aggression. This is a social challenge. A challenge to those who would sacrifice our democratic way of life for personal gains or foreign ideologies.

The best insurance for the continuance of our democracy is a successful democracy. That means a dynamic and not a static democracy. All of us who want to preserve the ideals that have made America . . . and that includes all but a handful of extremists . . . must determine to find the policies and programs which will permit us to make the most of the abundance nature has provided for us.

To achieve this end we must recognize the fact that we are but a wheel in the machinery of world economy. A wheel that must drive or be driven. A wheel that must mesh smoothly with the many other wheels or be stripped of its cogs.

We are the only nation on earth free enough and strong enough to shape the mould of its own destiny. We can be hampered by nothing but our own confusion.

* * *

The mind and the heart of all America today brood over the shores of Britain and watch over the narrow waters that wash the beaches of the Continent. And the prayers of all America go with each of those who embark upon that epic passage.

Those of us at home who are producing the fighting tools and who are so earnestly concerned with the problems that will face a postwar America, should see now, even if we may never have seen it before, that all our plans will be worth just exactly what the men and women who make that passage are prepared, competent, and inspired by their leadership to make them worth.

For those men and women are America!

They have gone out from rich homes and poor homes alike, from farms and factories, from schools and churches, from mines and ranches, from offices and studios, to take their places in the battle line. They are a cross-section of the America that is to be.

Whoever may draw the plans for that America, it is those men and women who will make the plans good. Invasion is their first step toward that end. May their work be speedily done, and may our plans be worthy of that work.



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California-Hawaii Conference Held

A Civil Aeronautics Board proceeding of major proportions began to take shape last week as a half dozen applicants for route certification between the West Coast and Hawaii appeared in pre-hearing conference before CAB Examiner Albert F. Beitel.

► **Battle Looms**—The case showed early signs of developing into a full dress battle. Various appli-

cants sought assurance that Pan American Airways, an intervener and the only line now operating between Hawaii and the mainland, would produce statistics on its past operations over the trans-Pacific route. PAA said it thought such information could be made available.

The presence of counsel for the Department of Justice, also an intervener, hinted at interesting future developments.

► **Matson Interested** — A major question of policy is expected in the case of Matson Navigation Co., steamship company which seeks to establish a parallel air service. The CAB has held that the intent of Congress as expressed in the Civil Aeronautics Act is that the "various forms of transportation should be mutually independent."

The applicants not only will seek to show that the public convenience and necessity require additional air service between the West Coast and Hawaii, but also that Pan American's present monopoly results in inadequate service and the traffic potential warrants additional routes.

► **Applicants**—The applicants and the routes they seek are: Hawaiian Airlines, Ltd., Honolulu to Los Angeles; Matson Navigation Co., San Francisco, Los Angeles, Portland and Seattle to Honolulu; Northwest Airlines, Seattle to Honolulu via Portland and/or Portland to Honolulu via Seattle, and direct service between Portland and Honolulu; United Airlines, Los Angeles and San Francisco to Honolulu; Western Air Lines, Los Angeles/San Francisco to Honolulu; Ryan School of Aeronautics, Los Angeles/San Francisco to Honolulu.

Counsel for the Bechtel-McCone-Parsons Corp. announced that the corporation would file an

application for a route to Honolulu within 30 days. Bechtel-McCone-Parsons is a firm of west coast shipbuilders which also operates a modification center for B-24 and B-29 bombers at Birmingham, Ala.

Transcontinental & Western Air withdrew an application for a Honolulu route when it announced its acquisition of 20 percent stock interest in Hawaiian Airlines.

► **Washington Session**—A canvass by the examiner revealed that some of the applicants would prefer a hearing on the West Coast, but others objected and it seemed likely it will be held in Washington.

Briefs are due July 30, and Sept. 11 has been chosen tentatively as a hearing date.

Air Chiefs Debate 'Chosen Instrument'

Patterson and Damon discuss issue before Chicago Economic Club.

The "chosen instrument" in international aviation after the war was alternately praised and decried in a debate last week before Chicago's Economic Club. W. A. Patterson, president of United Air Lines, spoke for it. Ralph S. Damon, vice-president of American Airlines, was against it. Both followed the lines of previous speeches.

Patterson said the people, already burdened with war taxation, would not tolerate "wasteful subsidies to satisfy the whims and ambitions of individual airline companies" in the international post-war field. Damon said any monopoly in post-war transoceanic service would be contrary to fundamental American principles.

► **Agree on Sharing Routes**—They appeared to agree that more than one airline might participate in such operation. Damon said the 17 domestic airlines that have come out for competition do not expect that each is going to fly on each foreign route. Patterson suggested that under his stand for one or more chosen instruments certain airlines might be given certain zones of operation.

There is opportunity, Patterson said, for companies operating under private enterprise to give evidence they can cooperate and contribute to "honest, fair competition." Damon asserted that the 17 airlines "subscribe to the good old American principle of competi-

tion," whether or not they achieve additional routes.

But where Patterson declared the airlines must work together to preserve top-flight position for the United States in world aviation and preserve air transport operations under private enterprise, Damon asserted that unification of any business into one company was the beginning of "stultification" and would lead ultimately to governmental control and probably government operation.

SHORTLINES

► **Nightly round-trip passenger flights** are to be started in mid-May by Panair do Brasil, Pan American Airways affiliate, between Rio de Janeiro and Sao Paulo. Schedule over the newly lighted airway calls for departure from Rio at 6:30 p.m. and return to the coast at 10:20 p.m.

► **Inclusion in shippers' catalogs** of data on air express has been suggested by Railway Express Agency and its Air Express division. Of such catalogs issued just before the war, 147 included air shipping data. The agency reports that many shippers discontinued issuance for the duration, but are considering resumption.

► **Air Line Dispatchers Association** announces that approval has been given salary scales outlined in agreement signed with Western Air Lines Feb. 6. The scales are retroactive to Oct. 20, 1943. A working agreement has been signed between Northwest Airlines and its flight superintendents, with terms retroactive to Aug. 1, 1943, and has been submitted to the National Railway Labor Panel for approval.

► **Five tons of plate glass** for control tower windows in Alaska recently were carried to the Territory by Pan

American Airways. The job was done by three planes.

CAB ACTION

● **Hearing before a Civil Aeronautics Board** examiner on proposed transfer of China National Aviation Corp. stock from China Airways Federal to Pan American Airways, Inc., has been set for June 6. Pan American plans to hold the 45 percent block of CNAC stock, effecting dissolution of China Airways Federal, a paper subsidiary. The Chinese government owns the remaining 55 percent. At a pre-hearing conference were Examiner Albert F. Beitel, Henry Friendly, counsel for Pan American, and Louis C. Goodkind, public counsel.

● **CAB has approved extension** until July 31 of the temporary permit under which Expreso Aereo Inter-Americano, S. A., operates between Miami and Havana. The permit was to expire, after previous extensions, Apr. 30. It originally was granted to provide additional air service in the Caribbean to meet wartime needs.

● **Inland Air Lines** has filed a notice of non-stop service between Billings and Great Falls, Mont., and Billings and Casper, Wyo., points on Inland's AM 28. Service will be started early this month.

● **CAB has found** that the Airlines Clearing House, Inc., is a non-profit service bureau not engaged in a phase of aeronautics, in dismissing applications for approval of three interlocking relationships. The men affected by the ruling are: Thomas F. Armstrong, secretary-treasurer and director of Eastern Air Lines and a director of the clearing house; L. B. Judd, assistant secretary and director of Delta Air Corp. and a director of the clearing house, and E. I. Whyatt, vice-president, treasurer and director of Northwest Airlines and president and director of the clearing house.

● **CAB has amended** Section 239.1 of the Economic Regulations to prohibit air carriers holding certificates of convenience and necessity from operating charter trips or special services without prior Board approval. Trips at the request of the Navy Dept. in Naval aircraft and emergency military missions are exempted. The regulation does not apply to flights originating and terminating in Mexico, Central and South America, and in the Caribbean area.

CAB SCHEDULE

May 8. Exceptions due to Examiner Beitel's report in the Denver Los Angeles case. (Docket 519 et al.)

May 8. Hearing before Examiner Ross I. Newmann on Pan American's acquisition of Aeronaves de Mexico S. A. (Docket 875).

May 11. Pre-hearing conference before Examiner Thomas L. Wrenn on American Airlines' proposed acquisition of American Export Airlines. (Dockets 1345 and 1346).

May 11. Pre-hearing conference involving route applications in the Rocky Mountain area. (Docket 152 et al.)

May 17. Deadline for exhibits in the Great Lakes-Florida case. A one-week extension from May 10 has been granted. (Docket 570 et al.)

May 22. Deadline for exhibits in Pan American's proposed acquisition of stock of China National Aviation Corp. (Docket 1351).

June 1. Deadline for exhibits in the Caribbean Latin American case.

June 3. Rebuttal exhibits in the Great Lakes-Florida case due.

June 6. Hearing on Pan American's acquisition of CNAC stock before Examiner Albert F. Beitel.

June 12. Hearing before Examiner Ross I. Newmann in the Great Lakes-Florida case.

June 30. Tentative deadline for exhibits in the applications of Woodley Airways and Alaska Airlines for mail service between Fairbanks, Anchorage and Kodiak, Alaska.

July 1. Rebuttal exhibits due in the Caribbean-Latin American proceedings.

July 17. Tentative hearing date for the Fairbanks-Anchorage-Kodiak mail case before Examiner Lawrence J. Kisters.

July 30. Briefs in the West Coast to Hawaii case due.

September 11. Tentative hearing date for the West Coast to Hawaii case before Examiner Albert F. Beitel.



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Aircraft Bears Fail to Account For Normal Growth, Says Analysis

Hare's Ltd., distributors of Aviation Group Shares, advances constructive view as to industry's current position; sees 1960 as possible peak year for production around five billion.

By ROGER WILCO

Not all investment dealers have despaired of the future outlook for aircraft equities. In a current analysis, Hare's Ltd. advances a constructive view as to the industry's current position and "normal" growth pattern. It must be recognized that this firm is distributor and merchandiser of Aviation Group Shares—an investment trust devoted exclusively to owning aviation securities. Despite this obvious bias, the review takes an interesting viewpoint deserving of careful attention.

The contention is advanced that, regardless of the war, aircraft manufacturing would have developed as a typical growth industry. Instead, the investor has overlooked this and it is alleged perspective has become warped from viewing the industry's swollen "war production" and thus visualizing a "fancied aftermath of collapse."

► **Normal Growth Curve**—To substantiate this appraisal of mistaken values, a normal growth curve, based on the production figures of nine leading aircraft manufacturers, is projected and reproduced in the accompanying chart. These nine companies are represented to account for 80 percent of the output of the entire aircraft manufacturing industry in the U. S., exclusive of such factors as General Motors, Chrysler and other emergency producers. These nine companies are: Boeing, Consolidated-Vultee, Curtiss-Wright, Douglas, Grumman, Lockheed, Martin, North American and United Aircraft.

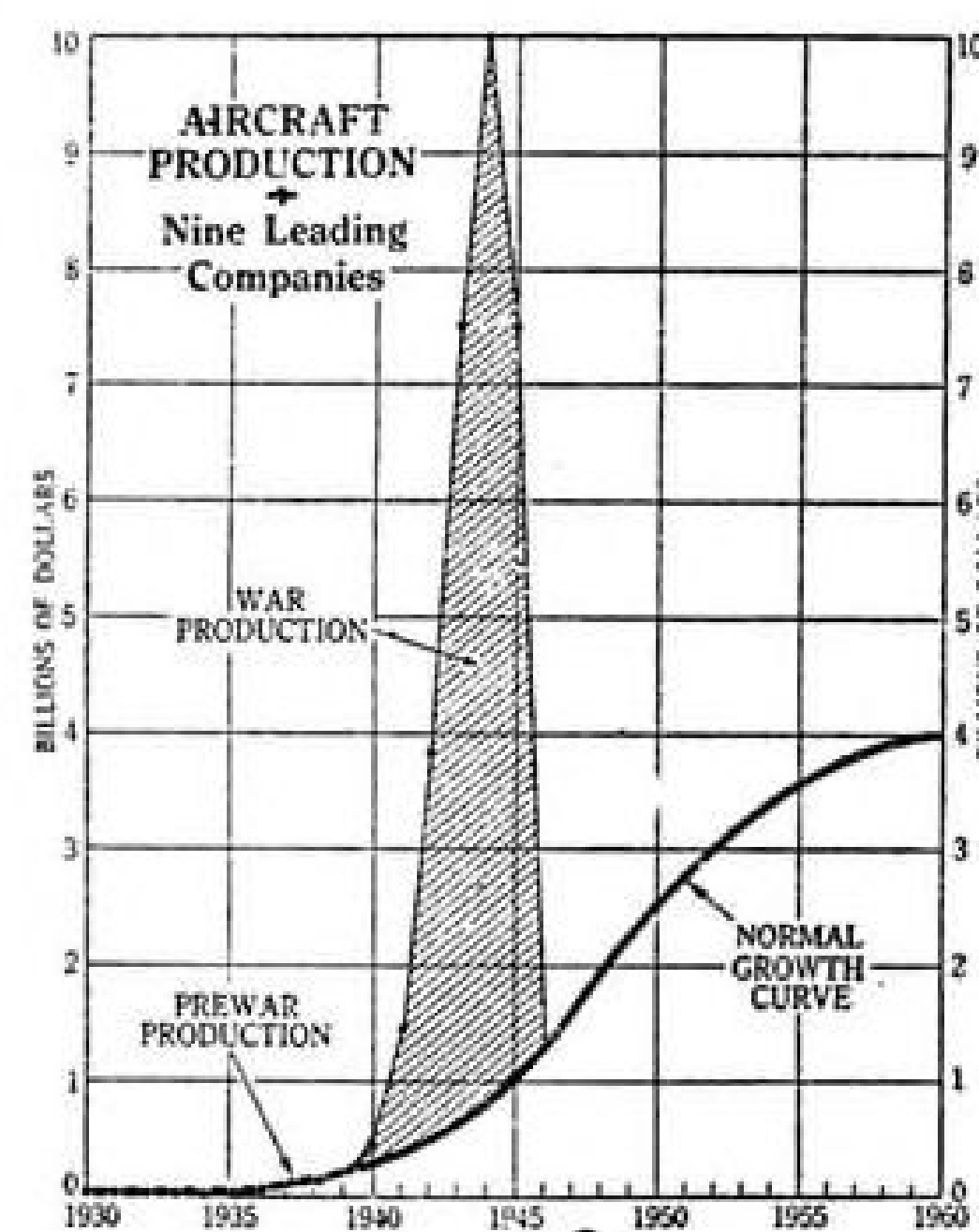
The chart starts with the year 1930, in which period the output of the nine companies aggregated about \$40,000,000. From this point, production for subsequent years has been plotted with estimates advanced for 1943 and 1944.

► **Peak Year Put in 1960**—The realm of the unknown is penetrated with an interesting normal growth curve extended from the year 1939 to an assumed peak year of 1960, when production of \$4,000,000,000 has been estimated. On the premise that these nine companies approximate 80 percent of the industry's production, the assumption is further made that the aircraft industry will produce \$5,000,000,000 of planes and engines in 1960.

Supporting this projection, Hare's Ltd. asserts that, inasmuch as automobile industry factory sales at wholesale prices approached almost \$4,000,000,000 in 1929, when the population was 120,000,000, "an estimate of \$5,000,000,000 for the aircraft industry by 1960, when the population may be around 160,000,000 would appear conservative."

Now, what's wrong with this picture?

► **Markets**—Some observers may fail to see the consistency in comparing the automotive and aviation markets as they differ radically.



For example, military purchases appear as the major source of business to the aircraft builders in the immediate years to come. Here again, some question may be raised as to the level of production in the peak year of 1960. So much is dependent upon factors which may remain vague for an indefinite period.

With military purchases representing the bulwark of future aircraft billings, how can such volume be determined when it is unknown if a peaceful or hostile world will emerge following the present conflict. The peace terms undoubtedly will influence the scope of aviation fleets to be maintained. In this respect, the whims of public opinion, as expressed through Congress, are always unpredictable. A huge air force may be demanded as a safeguard. Then again, a nation weary of war may place its faith in agreements and embark upon a disarmament policy. This latter course, however, appears unlikely for the immediate future.

► **World Production**—Further, England, Russia and, to a lesser extent Canada and other of our Allies, will also have tremendous aircraft production facilities crying for outlets. In other words, United States builders will not have a wide-open world market for their aircraft wares.

Despite the tremendous gains expected of commercial air transportation, the fleet of planes required to meet the demand does not appear to be of the proportions to swell the order backlogs of the builders.

► **National Income**—The small plane market may develop by leaps and bounds and may truly rival the automotive industry in growth. It is here where the anticipated population of 1960 and similarity of the auto and plane groups may have significance. Here too, however, a fundamental fallacy exists, as the level of national income will be a far more important determining influence than the mere growth of population. For that matter, the same criterion may be said to hold true for commercial and military aviation purchases.

In any event, the Hare's analysis does not anticipate the industry's dropping to nothing nor to its pre-war 1938-1939 level at the conclusion of hostilities. Instead, normal business for 1946 is placed at an annual rate of around \$1,000,000,000 or \$1,250,000,000.

► **Aircraft Shares Down**—The anal-

ysis further declares that, since 1939, aircraft shares have steadily declined in the face of substantial wartime earnings and the "unchanged favorable long-term outlook." The market is approximately at the 1935 level, when earnings were negligible and production was under \$50,000,000 or about one-twentieth of the estimated post-war resumption level of the industry.

Some interesting figures are also presented as to the ratio of present market prices to current and post-war earnings. It is asserted that, in the aggregate, the stocks of the nine companies presented are currently priced at around two times possible post-war earnings.

► **Supercaution**—Premised on its projections, Hare's concludes that due to the "supercaution of investors, leading aircraft stocks today are definitely undervalued in relation to what appear to be reasonable post-war prospects."

Regardless of how this market prognostication develops, there can be no denying the fact that there is considerable substance to this belief of a "normal" growth pattern for the aircraft industry.

Air Stock Trading Reported by SEC

Reveals transactions in own shares by officials of airline and aircraft firms.

A summary of stock transactions, involving airlines and aircraft and equipment manufacturers, has been reported for March by the Securities and Exchange Commission.

Samuel J. Solomon, director of Northeast Airlines, Inc., sold 1,484 shares of the company's common during March, according to reports made public by the Commission. At the close of the month Mr. Solomon had 18,000 shares of Northeast's common remaining in his portfolio.

John R. Longmire, director of Chicago and Southern Air Lines, reported purchase of 920 shares and sale of 100 shares of common through a joint account, increasing holdings of the account to 3,543 shares.

► **Colonial Airlines**—Sigmund Janas, president of Colonial Airlines, Inc., sold 200 common during March, reducing his ownership to 16,410 shares. A. C. Dick, secretary, sold 200 common stock in February, while Edward S. Rid-

Canadian Output

Canadian aircraft production for the first quarter of 1944 totaled 1,303 aircraft compared with 1,033 in the 1943 period, an increase of one-third. On a poundage basis, increase for the first quarter was up 65 percent from 5,200,000 pounds to 8,500,000 pounds in 1944, according to figures released by the Department of Munitions and Supply, Ottawa. This reflects the swing in Canadian aircraft production from lighter trainers to heavier service craft.

ley, vice-president, purchased 500 shares of the stock in January.

John S. Woodbridge, director of Pan American Airways Corp., sold 100, leaving him 1,000 shares. George L. Rihl, vice-president, in July, 1943, purchased 2,333 shares of Pan American Airways stock.

Harold Fabian, director of Western Air Lines, Inc., purchased 100 common.

► **American Airlines**—Late reports filed by officials of American Airlines, Inc., disclosed purchase of 90 common in February by Chandler Hovey, director, and sale of 200 shares last December by Orval M. Mosier, vice-president. Harold B. Clark, director of Pennsylvania-Central Airlines, reported purchase of 200 in February.

Among the manufacturing corporations, Lawrence D. Bell sold 1,500 Bell Aircraft Corp. common in March, leaving him 21,411 shares.

► **Consolidated Vultee**—Raymond S. Pruitt, director of Consolidated Vultee Aircraft Corp., sold his entire holdings of 300 preferred and also sold 500 common. His ownership at the end of March consisted of 680 common. Louis A. Johnson, director, sold 325 common in January.

William K. Ebel, vice-president of Glenn L. Martin Co., sold 100 common during March, giving him a balance of 800 shares. G. C. Woodward, secretary of Ryan Aeronautical Co., sold 200 common, leaving him 100 shares.

J. A. Harris, 3rd, director and principal stockholder of Jacobs Aircraft Engine Co., gave away 2,000 shares of the capital stock in March, reducing his ownership to 251,667 shares.

John B. Walker, director of Aircraft Accessories, sold 1,000 common during February.

Financial Reports

► **Minneapolis-Honeywell Regulator Co.** reports net income of \$747,229, including an estimated post-war refund of \$191,122, for quarter ended Mar. 31, 1944, allowing for reserves for taxes and provisions for estimated refunds to the government, equivalent, after preferred dividends, to 40 cents a share on 1,243,800 common before the post-war refund and 55 cents a share after adding such a refund. Net income for the 1943 period was \$625,213, including post-war refund of \$106,550, or 91 cents a share on 621,900 common then outstanding. Comparative results to reflect the two-for-one split in stock carried out in March, 1944, would be 46 cents a share.

Electrically Heated Flying Suits Tested

Electrically heated flying equipment developed by the General Electric Co. for the Army Air Forces is being tested in the unusual atmosphere of the Mount Washington, N. H., weather observatory, where wind velocities reach 231 miles an hour and the temperature toboggans to 50 degrees below zero.

The observatory is atop the 6,300-foot mountain, and an average of only 13 days out of every 100 are clear. During the experiments, the six men comprising the staff wear the flying suit, goggles and boots as they move about checking their instruments.

New Torque Wrench

A highly versatile production line torque wrench, giving both an audible and physical signal when desired load is reached, has been developed by Richmond Inc., Los Angeles.

The company announced that the wrenches can be set at torques specified by the buyers and ranging from eight to 750 inch pounds. Torque tolerances are held to 2 percent plus or minus, it is said. This socket-drive model uses a lock connection and is adaptable to innumerable heads, extensions, crowfeet, etc., and does not require dials, battery indicators or bulky equipment in its use, the company announcement says, making it valuable for use in dark or noisy areas, inside a wing or fuselage or on the flight ramp.

Wright Field Progress

THE AIRCRAFT INDUSTRY justifiably has received liberal credit consistently in this war for its productive and engineering genius. But the public has heard little about the accomplishments of the Army Air Forces' Materiel Command Laboratories at Wright Field, because military secrets cannot be announced.

With the realization that properly directed information can have an important effect on the war effort, Materiel Command, which is responsible for engineering, development, production and inspection of all AAF equipment, broke a rule of some 25 years to admit members of the Aviation Writers Association to their inner sanctum, provided they would keep the nation's secrets.

The officers displayed and told secrets to the writers—for background use only—which made the field's public relations officers blanch. The writers, who pride themselves on keeping abreast of today's actualities and tomorrow's possibilities, were astonished.

The public would be amazed. It would find difficulty in believing a few of our skeptics who persist in considering today's limits also those of 1950. All aviation development has followed step by step the development of materials. The war is giving unprecedented impetus to such technological research.

The writers saw the Bell jet propulsion "squirt" start its turbine, ignite, take off with a thin trailing wisp of smoke, and land. A huge wind tunnel was testing an engine and wing section of a giant which will be flying in another year. They watched radar and loran demonstrations and heard of new devices which will outmode the present mechanisms. They peered through the Norden and Sperry bombsights, both under constant improvement. They saw the Boeing B-29 *Superfortress*, the Northrop *Black Widow*, the improved Bell fighter, large and small ships which cannot yet be mentioned; the Sikorsky helicopter; experimental *Mitchells*, *Fortresses* and *Liberators* with gadgets yet to surprise the enemy; bazookas and their rocket relatives; cannon, new guns, gun installations and controls.

"Highly accurate bombsights and jet propulsion planes, marvelous as they have turned out to be, will soon give way to even greater marvels," Maj. Gen. Charles E. Branshaw, commanding general, emphasized, repeating a statement made several weeks ago.

Brig. Gen. Franklin O. Carroll, in an hour's address illustrated with special charts, outlined the future plans and possibilities of jet propulsion, and the continued promise of air cooled and liquid cooled engines, which will be with us for a long time, although constantly pushed to higher horsepower outputs. One engine, for example, is producing twice the horsepower of its early days.

Engines producing the equivalent of 6,000 hp. are in sight.

The 400 mph. speed limit has been exceeded substantially. It is probably safe to say that we shall be over the 500 mph. hurdle soon.

Big ships are on the way—of staggering size. They

are nearer than most of us had realized. They will bring non-military versions which will fly experimentally to determine costs and economic possibilities, and they must prove out. Some, admittedly, will be orphans. Others will go into production and take over long-range commercial business gradually.

Tests at 50,000 feet altitude will come.

Unconventional aircraft of flying wings, pusher and contrarotating propellers, combinations of jet propulsive and conventional power all are to be given their chance.

"One small group of engineers here has been told never to have a practical idea," Gen. Carroll reported. "They can draw some funny airplanes, but they may not be so funny or impractical three or five years from now. These men must keep ahead of today's possibilities."

That is typical of the philosophy the Wright Field visitor finds.

Sensible Airport Planning

WILLIAM A. MARA, pioneer Stinson executive who knows his private flying, voices a plea which deserves the widest circulation in government and Congressional circles. He is one of a group of this country's sensible, plain-talking aviation realists who know that the safest, most economical lightplane built will not be operating at anything approaching its maximum cross-country utility without an adequate network of tracts available for takeoffs and landings.

The several hundred airline and military airports now in existence, and others like them, will always be needed but they are not the types of airports the small towns can afford, or in which the personal airplane owner is even interested, Mr. Mara points out.

Mara advocates 20,000 new air strips placed ten miles apart in a system of squares which would cover the country. Cost would be about \$90,000,000, or approximately \$4,500 per strip, contrasted with about \$25,000 for a single mile of the national highway system.

Each strip would be from 150 to 200 feet wide, and 1,500 to 2,000 feet long.

"Along with the air strip, the pilot will need a simple system of aerial markers or road signs," Mara writes in the new issue of Consolidated Vultee's magazine, *Plane Talk*.

"These will tell him where he is at any time, and so permit him to fly without learning a complicated system of navigation."

Mara's plan is one of several simple systems of airports and marking being discussed. All of them have merit.

The single warning which must be made clear to government and to Congress is to fight off any tendency to use private flying as a means of jumping real estate prices and enriching local landowners and contractors by buying sites unnecessarily large and setting up elaborate facilities with high maintenance costs which will turn the already harassed taxpayer against all flying. Extravagance in small airport planning will be inexcusable.

ROBERT H. WOOD



When Tomorrow Meets Yesterday...In **CHINA**

For untold centuries, the plodding water buffalo has been the mainstay of economy in the lives of millions of Chinese. Venerated and respected, these great slow beasts are a fundamental source of motive power for transportation — serving the functions of truck, tractor and automobile — to countless Chinese.

But in tomorrow's China . . . the China which will emerge after Victory, the development and rapid expansion of commercial and personal transportation, may be little short of phenomenal.

The helicopter may become a familiar sight in the blue China skies over landscapes both rural and urban. And great passenger planes and cargo carriers will be able to transport more men and merchandise more miles in minutes—than carts and caravans might carry in many months.

For new China now numbers among her sons and daughters, thousands of trained, keen-eyed pilots and skilled aircraft maintenance workers . . . millions of progressive, well-educated citizens whose courage, intelligence and energy can bring China the prosperity and position it so richly deserves . . . a standing in World affairs as enduring as the ancient Chinese tradition of culture and courtesy. But Victory must come first.

Right now, at McDonnell, we're working three shifts a day making planes, parts, and plastics for the United Nations' war effort. But *after Victory*, we hope to add our contribution to the development of China's post-war aviation industry... to the prosperity which can be China's through a fuller realization of its own rich resources.

MCDONNELL *Aircraft Corporation*

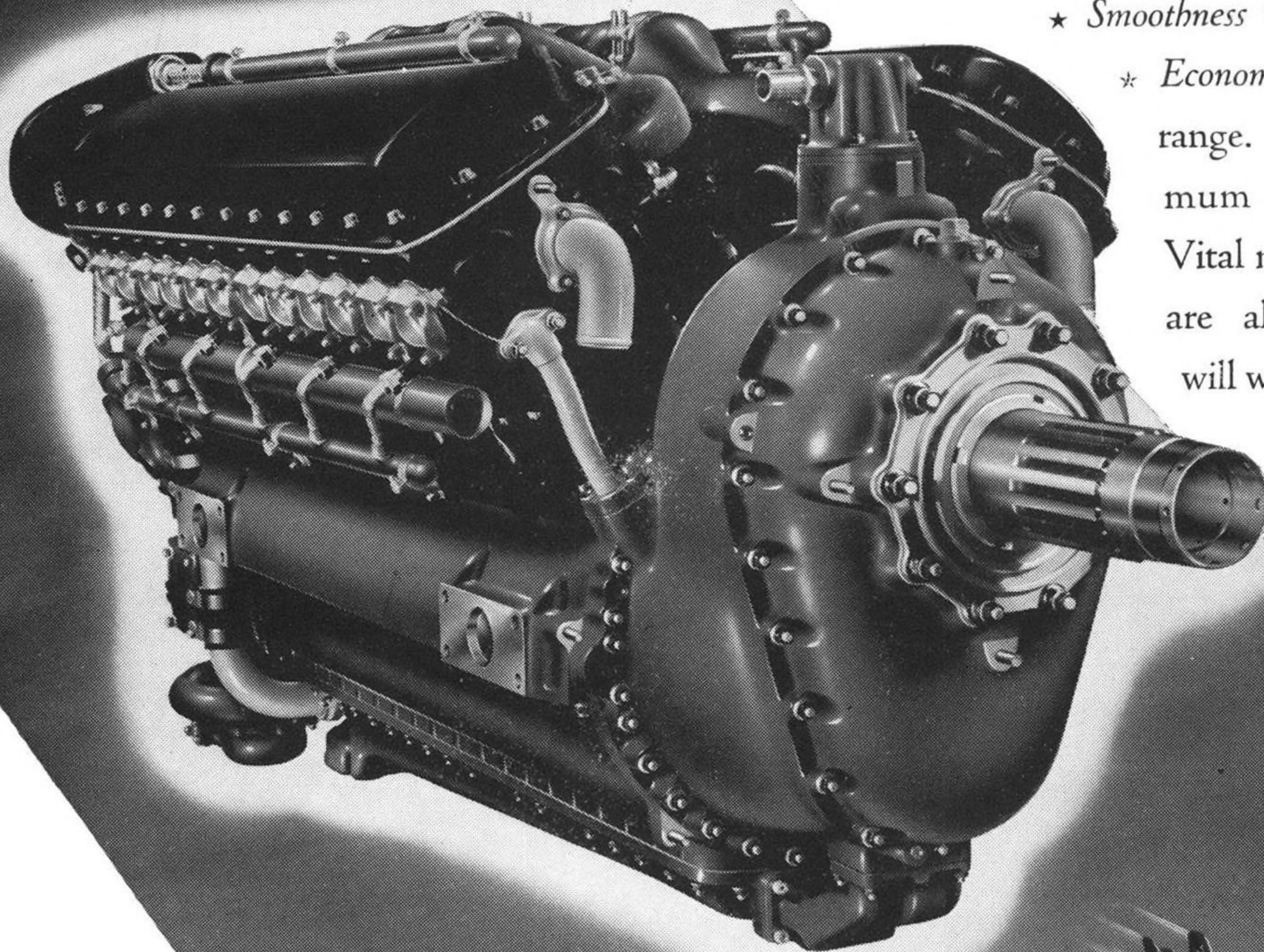
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★ *Smoothness* to lessen pilot fatigue.

★ *Economy* for greatest fighting range. ★ *Durability* for maximum fighting readiness. ★ Vital now for our flyers, these are also characteristics you will want in engines that will power postwar planes.



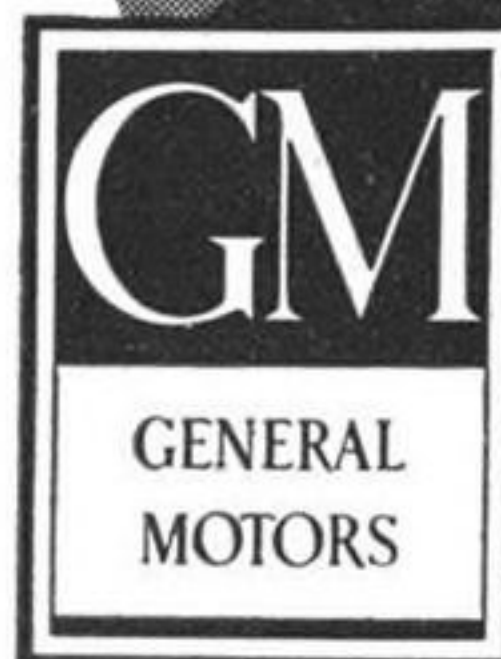
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P-40—Warhawk • A-36 and P-51—Mustang

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