AERONAUTICS

Postwar Transports

Air transport industry faces critical period in decade following the war. Diesel engines may be used in long-range planes, and all will have radar.

➤ THE MOST critical period to be faced by the air transport industry will be the first decade following the end of the war, declared Charles Froesch, chief engineer of Eastern Air Lines, Inc., speaking at the meeting of the Society of Automotive Engineers in New York.

"It is safe to say, at the outset, that the day of transport airplane standardization, as we have known it for the past seven years . . . is over," he said, "for as we grow we must provide a public service ranging from local passenger service operation to long range passenger service, as well as air cargo facilities to the shipper of merchandise requiring speed of movement."

Five distinct types of airplanes will be required for these purposes.

Three successive periods of development are expected during the ten-year period. They are the transition period, changing from war to commercial activities, an intermediate period of readjustment and expansion, and a development era of efficient large-scale operation of improved large and small planes, and ground handling which will establish the air transport industry as big business.

"Any transport plane must be conceived around its passenger cabin and cargo compartment for passenger operation, or its cargo compartment if especially designed for air cargo service," Mr. Froesch stated.

"Every part of the airplane should be designed for utility. No operating function must be either sacrificed or compromised, yet the designer must continually bear in mind simplicity of design."

The power plant is of particular importance. Accessibility for overhaul without too great a loss of time is an essential. Diesel engines, he suggested, may some day be used in transcontinental and other long-range passenger and cargo planes.

"Fuel cost represents today approximately 12% of all direct flight costs and therefore any possible reduction permitted by the substitution of a cheaper fuel is worth investigating," he stated.

"In view of amazing advances in radio, it is difficult at this time to outline any specifications, except to say that modifications of the much discussed radar should give us an excellent postwar instrument landing system and perhaps provide what might be virtually called a block system of the air. Postwar transport radio equipment will undoubtedly include equipment for landing, automatic compass, communications equipment, and ultra high frequency radio range receivers."

Science News Letter, July 24, 1943

RESOURCES

Iron Printing Plates May Replace Copper and Nickel

➤ IRON printing plates, releasing the copper and nickel now used for service on the war front, have been made possible through research at the Battelle Memorial Institute in Columbus, Ohio. The new process, just announced, represents the completion of two years of experimentation, in which 125 different iron-plating solutions were tried out.

Battelle engineers have developed a solution which will produce deposits of electrolytic iron satisfactory for normal electrotyping operations and for the hard surfacing of stereotypes.

Copper and nickel can be reduced 50% to 70% by processes well tested commercially, and eliminated entirely by a process that works successfully in the laboratory and which is now undergoing commercial production tests, it is claimed.

Ferrous sulfate, ferrous chloride and ammonium chloride, in definite proportions, are the essential components of the iron plating electrolytic bath. Iron anodes are used, the electrotype mold itself serving as the cathode. The iron can be plated on treated lead molds, or on wax molds previously oxidized with copper or silvered with a silver spray apparatus.

To be successful, the bath must be prepared carefully according to specifications, but the process is not too technical for commercial practice. The investigation was sponsored by Printing Plates Research, Inc., a non-profit corporation.

Science News Letter, July 24, 1943

ENGINEERING

Shooting Electrons Aid Attack on Rust, Corrosion

➤ SHOOTING BILLIONS of electron bullets per second, the electronic diffraction camera is being used for a new scientific attack on rust and corrosion.

These silent saboteurs of metal war equipment are being investigated at the Westinghouse Research Laboratories by Dr. Earl A. Gulbransen through studies of the atomic structure of coatings that "grow" on steel, aluminum and copper when these metals are exposed to air or corrosive chemicals.

"Just as some types of bacteria are beneficial to human beings," Dr. Gulbransen explained, "some of these oxide coatings protect the metal underneath them. Others, of course, like rust, are harmful. With this electronic camera, we are testing new theories as to how these coatings are formed."

The camera bounces electrons off a highly polished button of aluminum or steel on which an oxide coating is being built up. Electrons ricochet off different faces of the molecules of the coating, and strike a strip of photographic film. A design is formed on the film from which atomic structure can be interpreted.

Such research points the way toward development of longer-wearing bearings and cylinders for plane and auto engines, better tin cans and cheaper stainless steel.

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