HGB:GDM
O-7

DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
WASHINGTON, D. C.

Letter
Circular
LC-325
(Superseding
LC-285)

# AERONAUTICAL PUBLICATIONS BY MEMBERS OF THE STAFF OF THE BUREAU OF STANDARDS.

(April 13, 1932.)

Contents.



*********

## GENERAL INFORMATION

This Letter-Circular is a list of papers on aeronautics by members of the staff of the Bureau of Standards. Some of these have been published in the regular series of publications of the Bureau of Standards, others in the publications of the National Advisory Committee for Aeronautics, and still others in various scientific and technical journals.

Unless specifically stated, none of the papers herein listed are obtainable from the Bureau of Standards. Those marked with an asterisk (*) are out of print, but, in general, may be consulted at the libraries in large cities.

Where the price is given, the publication must be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C. The prices quoted are for delivery to addresses in the United States and its possessions, Canada, Cuba, Mexico, Newfoundland, and the Republic of Panama. When remitting for delivery to other countries, include in your remittance one-third of the total cost of publications to cover postage. Remittances should be made payable to the "Superintendent of Documents, Government Printing Office, Washington, D. C." (in United States currency) and sent to him with order.

The publications of the Bureau of Standards and of the National Advisory Committee for Aeronautics are designated by a series letter followed by a number. The explanation for these letters is as follows:

RP = "Research Paper." These are reprints of articles appearing in the "Bureau of Standards Journal of Research." When applying at a library, the Journal should be asked for.

S = "Scientific Paper" of the Bureau of Standards. This series has been superseded by the "Journal of Research."

T = "Technologic Paper" of the Bureau of Standards. This series has likewise been superseded by the "Journal of Research."

C = "Circular" of the Bureau of Standards.

M = "Miscellaneous Publication" of the Bureau of Standards.

TN = "Technical Note" of the National Advisory Committee for Aeronautics, Washington, D. C. (Mimeographed.) Obtainable without charge from the committee.

TR = "Technical Report" of the National Advisory Committee for Aeronautics. Those reports which are out of print will be found in the annual volumes of the committee. These volumes are available for reference or loan in the libraries of large cities and in the Office of Aeronautical Intelligence, National Advisory Committee for Aeronautics, Washington, D. C. A table showing the Technical Reports included in each annual volume is noted below.

| Annual volume. | Fiscal year. | Containing Tech. Reports Nos. | | Annual volume. | Fiscal year. | Containing Tech. Reports Nos. | |
|---|---|---|---|---|---|---|---|
| *First | 1915 | 1-7 | | *Ninth | 1923 | 159-185 | |
| *Second | 1916 | 8-12 | | *Tenth | 1924 | 186-209 | |
| Third | 1917 | 13-23 | $1.50 | *Eleventh | 1925 | 210-232 | |
| *Fourth | 1918 | 24-50 | | *Twelfth | 1926 | 233-256 | |
| *Fifth | 1919 | 51-82 | | Thirteenth | 1927 | 257-282 | $1.25 |
| *Sixth | 1920 | 83-110 | | Fourteenth | 1928 | 283-308 | $1.25 |
| *Seventh | 1921 | 111-132 | | Fifteenth | 1929 | 309-336 | $2.35 |
| *Eighth | 1922 | 133-158 | | Sixteenth | 1930 | 337-364 | $3.00 |
| | | | | Seventeenth | 1931 | 365-400 | (In press |

In the case of papers not published in any of the above series a complete reference to the journal in question is included. These journals may, in general, be consulted at libraries in large cities or may be obtained from the publishers direct. Copies cannot be obtained from the Bureau of Standards. It is not possible to include information on their availability or price.

## AERODYNAMICS

Series No. Title.

S394 Air forces on circular cylinders, axes normal to the wind, with special reference to dynamical similarity. H. L. Dryden. (1920) 5¢.

S523 Wind pressure on structures. H. L. Dryden and G. C. Hill. (1926) 20¢

## AERODYNAMICS (Continued)

| Series No. | Title. |
|---|---|
| RP193 | The characteristics of two-blade propeller fans. H. L. Dryden and P. S. Ballif. (1930) 10¢ |
| RP221 | Wind pressure on circular cylinders and chimneys. H. L. Dryden and G. C. Hill. (1930) 15¢ |
| RP283 | Further measurements of propeller fan characteristics. P. S. Ballif and H. L. Dryden. (1931) 10¢ |
| RP301 | Wind pressure on a model of a mill building. H. L. Dryden and G. C. Hill. (1931) 10¢ |
| M46 | War work of the Bureau of Standards. H. G. Boutell. (1921) 70¢ |
| TN129* | Notes on aerodynamic forces on airship hulls. L. B. Tuckerman. (1923) |
| TR207* | Aerodynamic characteristics of airfoils at high speeds. L. J. Briggs, G. F. Hull, and H. L. Dryden. (1925) |
| TR231 | Investigation of turbulence in wind tunnels by a study of the flow about cylinders. H. L. Dryden and R. H. Heald. (1926) 10¢ |
| TR255 | Pressure distribution over airfoils at high speeds. L. J. Briggs and H. L. Dryden. (1927) 15¢ |
| TR298 | Effect of variation of chord and span of ailerons on rolling and yawing moments in level flight. R. H. Heald and D. H. Strother. (1928) 10¢ |
| TR319 | Aerodynamic characteristics of twenty-four airfoils at high speeds. L. J. Briggs and H. L. Dryden. (1929) 15¢ |
| TR320 | The measurement of fluctuations of air speed by the hot wire anemometer. H. L. Dryden and A. M. Kuethe. (1929) 15¢ |
| TR342 | Effect of turbulence in wind tunnel measurements. H. L. Dryden and A. M. Kuethe. (1930) 10¢ |
| TR343 | Effect of variation of chord and span of ailerons in rolling and yawing moments at several angles of pitch. R.H. Heald, D. H. Strother, and B. H. Monish. (1930) 15¢ |
| TR365 | Aerodynamic characteristics of circular-arc airfoils at high speeds. L. J. Briggs and H. L. Dryden. (1930) 10¢ |
| TR370 | Effect of variation of chord and span of ailerons on hinge moments at several angles of pitch. B. H. Monish. (1930) 10¢ |
| TR392 | Reduction of turbulence in wind tunnels. H. L. Dryden. (1931) 10¢ |

## AERODYNAMICS (Continued)

Section on aerodynamics. L. J. Briggs and H. L. Dryden. International Critical Tables, vol. 1, 1926, pp. 402-411. (McGraw-Hill Pub. Co., New York, N. Y.)

Control of airplanes at low speeds by means of conventional ailerons. Anonymous. Aeronautics Bulletin No. 15 (Aeronautics Branch, Department of Commerce, Washington, D. C.); July 1, 1931.

The effect of compressibility on the characteristics of airfoils. L. J. Briggs and H. L. Dryden. Proceedings, International Congress of Applied Mechanics, 1930 (Stockholm, Sweden); 1931.

The pressure of the wind on large chimneys. H. L. Dryden and G. C. Hill. Proceedings, National Academy of Sciences (Washington, D. C.); November, 1930.

## AIRCRAFT MATERIALS AND CONSTRUCTION

| Series No. | Title. |
|---|---|
| S337* | Constitution and metallography of aluminum and its light alloys with copper and with magnesium. P. D. Merica, R. G. Waltenberg, and J. R. Freeman, jr. (1919) |
| S347 | The heat treatment of duralumin. P. D. Merica, R. G. Waltenberg, and H. Scott. (1919) 10¢ |
| S426 | Thermal expansion of nickel, monel metal, stellite, stainless steel, and aluminum. Wilmer Souder and P. Hidnert. (1921) 10¢ |
| S497 | Thermal expansion of aluminum and various important aluminum alloys. P. Hidnert. (1925) 15¢ |
| S565 | Thermal expansion of beryllium and aluminum-beryllium alloys. P. Hidnert and W. T. Sweeney. (1927) 10¢ |
| T113* | Determination of permeability of baloon fabrics. J. D. Edwards. (1918) |
| T139* | Some tests of light aluminum casting alloys - The effect of heat treatment. P. D. Merica and C. P. Karr. (1919) |
| T152 | Investigation of the compressive strength of spruce struts of rectangular cross section and the derivation of formulas suitable for use in airplane design. J. E. Boyd. (1920) 10¢ |
| T258 | Strength of steel tubing under combined column and transverse loading, including tests of columns and beams. Tom W. Greene (1924) 15¢ |
| T270 | An analysis of the deformationof the mooring spindle of the SHENANDOAH. L. B. Tuckerman and C. S. Aitchison. (1925) 10¢ |

## AIRCRAFT MATERIALS AND CONSTRUCTION (Continued)

| Series No. | Title. |
|---|---|
| T275 | Design of specimens for short-time "fatigue" tests. L. B. Tuckerman and C. S. Aitchison. (1924) 5¢ |
| T346 | Electrodeposition of chromium from chromic acid baths. H. E. Haring and W. P. Barrows. (1927) 15¢ |
| C346 | Light metals and alloys; aluminum; magnesium. (1927) $1.10. |
| M46 | War work of the Bureau of Standards. H. G. Boutell. (1921) 70¢ |
| RP29 | Thermal expansion of magnesium and some of its alloys. P. Hidnert and W. T. Sweeney. (1928) 10¢ |
| RP63 | Soundproofing of airplane cabins. V. L. Chrisler and W. F. Snyder. (1929) 5¢ |
| Letter Circular VII-1-12 | Fire-proof and transparent airplane wing coverings. L. B. Tuckerman. (1919) Free on application to Bureau of Standards. |
| Letter Circular VII-1-16 and 18a | Proposed aeronautical specifications; streamline stay wires. (Jan. 16, 1922) Free on application to Bureau of Standards. |
| TR35* | The strength of one-piece, solid, built-up, and laminated wood airplane wing beams. John H. Nelson. (1918) |
| TR36* | The structure of airplane fabrics. E. D. Walen. (1918) |
| TR37* | Fabric fastenings. E. D. Walen and R. T. Fisher. (1918) |
| TR39* | The testing of balloon fabrics. Part I.- Characteristic exposure tests of balloon fabrics. Part II.- Use of ultra-violet light for testing balloon fabrics. J. D. Edwards and I. L. Moore (1918). |
| TR77* | Parker variable camber wing. Humphrey F. Parker. (1919) |
| TR210 | Inertia factors of ellipsoids for use in airship design. L. B. Tuckerman. (1925) 5¢ |
| TR211 | Water model tests for semirigid airships. L. B. Tuckerman. (1925). 5¢ |
| TR348 | Strength of welded joints in tubular members for aircraft. H. L. Whittemore and W. C. Brueggeman. (1930) 30¢ |
| TR356 | Strength of rectangular flat plates under edge compression. Louis Schuman and Goldie Back. (1930) 15¢ |

## AIRCRAFT MATERIALS AND CONSTRUCTION (Continued)

| Series No. | Title. |
|---|---|
| TN78* | Impact tests for woods. (1922) |
| TN282 | Corrosion embrittlement of duralumin. I. Practical aspects of the problem. H. S. Rawdon. (1928) |
| TN283 | Corrosion embrittlement of duralumin. II. Accelerated corrosion tests and the behavior of high-strength aluminum alloys of different compositions. H. S. Rawdon. (1928) |
| TN284 | Corrosion embrittlement of duralumin. III. Effect of the previous treatment of sheet materials on the susceptibility to this type of corrosion. H. S. Rawdon. (1928) |
| TN285 | Corrosion embrittlement of duralumin. IV. The use of protective coatings. H. S. Rawdon. (1928) |
| TN304 | Corrosion embrittlement of duralumin. V. Results of weather-exposure tests. H. S. Rawdon. (1929) (Also appeared as Technical Publication No. 173, American Institute of Mining and Metallurgical Engineers, 29 West 39th St., New York, N. Y., February, 1929 meeting.) |
| TN305* | Corrosion embrittlement of duralumin. VI. The effect of corrosion accompanied by stress on the tensile properties of sheet duralumin. H. S. Rawdon. (1929) (Also appeared as Preprint 42, American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa., June, 1929, meeting.) |
| TN307 | Strength of tubing under combined axial and transverse loading. L. B. Tuckerman, S. N. Petrenko, C. D. Johnson. (1929) |
| TN335 | The structure and properties of parachute cloth. H. J. McNicholas and A. F. Hedrick. (1930) |
| TN350 | Methods for the identification of aircraft tubing of plain steel and chromium molybdenum steel. W. H. Mutchler and R. W. Buzzard. (1930 |
| TN393 | An investigation of cotton for parachute cloth. W. D. Appel and R. K. Worner. (1931) |
| TN400 | Advantages of oxide films as bases for aluminum-pigmented surface coatings for aluminum alloys. R. W. Buzzard and W. H. Mutchler. (1931). |

Properties of airplane fabrics. E. D. Walen. American Society of Mechanical Engineers (29 W. 39th St., New York, N. Y.), Transactions, vol. 40, p. 509; 1918. Discussion on pp. 530-535; 1919.

AIRCRAFT MATERIALS AND CONSTRUCTION (Continued)

Textile war work of the Bureau of Standards. E. D. Walen. Textile World (334 Fourth Ave., New York, N. Y.), vol. 55, p. 124; January 11, 1919.

Balloon fabrics and their testing. J. D. Edwards. Textile World (334 Fourth Ave., New York, N. Y.), vol. 55, p. 31; February 8, 1919.

Report on dirigible design. Engineering News-Record (10th Ave. & 36th St., New York, N. Y.), vol. 89, No. 26, p. 1137; Dec. 28, 1922.

Discussion on tests of thin gage metals. H. L. Whittemore, Proceedings, American Society Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 24, Part II, pp. 1006-1011; 1924.

Tests of ball bearings for rotating beam fatigue machines. L. B. Tuckerman and C. S. Aitchison. American Machinist (10th Ave. & 36th St., New York, N. Y.), vol. 61, No. 10, p. 369; Sept. 4, 1924.

Metal airplane wing patent. H. L. Whittemore. Patent No. 1,516,480 (Issued Nov. 18, 1924). Patent Office, Department of Commerce, Washington, D. C. 10¢

Duralumin as a structural material. G. K. Burgess. Scientific American (24 W. 40th St., New York, N. Y.), pp. 51-52, January, 1925).

Properties of duralumin (corrosion). Engineering News-Record (10th Ave. & 36th St., New York, N. Y.), Nov. 26, 1925, No. 22, pp. 862-863; Dec. 17, 1925, vol. 95, No. 25, pp. 979, 1000, 1001, 1006; Jan. 7, 1926, vol. 96, No. 1, pp. 1, 34.

Discussion of Templin's paper "Effect of size and shape of test specimen on tensile properties of thin sheet metal." H. L. Whittemore. Proceedings, American Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 26, Part II, p. 401; 1926.

Discussion: Tensile testing of thin sheet metal by Templin. H. L. Whittemore. Proceedings, American Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 27, Part II, Technical Papers p. 256; 1927.

Steel requirements of the aircraft industry. H. J. French. American Iron & Steel Institute Yearbook, 1928, p. 350 (40 Rector St., New York, N. Y.).

The investigation of welded joints for aircraft by the Bureau of Standards. W. I. Gaston. Aviation Engineering (Lyon Block, Albany, N. Y.), vol. I, No. 1, p. 9; October, 1928.

Testing joints for aircraft structures welded under procedure specifications. H. L. Whittemore. Journal of the American Welding Society (29 W. 39th St., New York, N. Y.), vol. VII, No. 12, p. 31; December, 1928.

## AIRCRAFT MATERIALS AND CONSTRUCTION (Continued)

Effect of corrosion accompanied by stress on the tensile properties of sheet duralumin. H. S. Rawdon. American Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 29, Part II, p. 314; 1929.

Testing welded joints for aircraft structures. H. L. Whittemore. Airway Age (34 N. Crystal St., E. Stroudsburg, Pa.), vol. 10, No. 2, p. 161; February, 1929.

Corrosion-prevention methods as applied to aircraft construction. H. S. Rawdon, American Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 30, Part II, p. 61; 1930.

Silencing the airplane. H. L. Dryden. American Society of Mechanical Engineers (29 W. 39th St., New York, N. Y.), Fourth National Aeronautical Meeting, Dayton, Ohio; May, 1930.

Procedure control in aircraft welding. H. L. Whittemore, J. J. Crowe, and H. H. Moss. Proceedings, American Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 30, Part II, p. 140; 1930.

Discussion: Aircraft Materials. L. B. Tuckerman. Proceedings, Amer. Soc. Test. Mtrls. (1315 Spruce St., Phila., Pa.), vol. 30, Part II, p. 195; 1930.

Procedure control for aircraft welding. H. L. Whittemore, J. J. Crowe, and H. H. Moss. Welding (Steel Publications, Inc., 108 Smithfield St., Pittsburgh, Pa.) vol. 1, No. 9, p. 589; July, 1930.

Reduction of airplane noise. Anonymous. Aeronautics Bulletin No. 25 (Aeronautics Branch, Department of Commerce, Washington, D. C.), October 1, 1930.

Surface coatings for aluminum alloys. W. H. Mutchler. Metals and Alloys (Chemical Catalog Co., New York, N. Y.), vol. 2, p. 324; December, 1931.

## AERONAUTIC POWER PLANTS

| Series No. | Title. |
|---|---|
| S424 | Mathematical theory of induced voltage in the high-tension magneto. F. B. Silsbee. (1921) 15¢ |
| T211 | Radiators for aircraft engines. S. R. Parsons and D. R. Harper 3d. (1922) 50¢ |
| T287 | A hot-wire anemometer for measuring air flow through engine radiators. C. G. F. Zobel and L. B. Carroll. (1925) 5¢ |
| T293 | Condensation of water from engine exhaust for airship ballasting. R. F. Kohr. (1925) 25¢ |

## AERONAUTIC POWER PLANTS (Continued)

| Series No. | Title. |
|---|---|
| RP118 | Correcting engine tests for humidity. D. B. Brooks. (1929) 10¢ |
| M46 | War work of the Bureau of Standards. H. G. Boutell. (1921) 70¢ |
| TR43* | Synopsis of aeronautic radiator investigations for the years 1917 and 1918. R. V. Kleinschmidt. (1918) |
| TR44 | The altitude laboratory for the testing of aircraft engines. H. C. Dickinson and H. G. Boutell. (1918) 10¢ |
| TR45* | Effect of compression ratio, pressure, temperature, and humidity on power. (1918)<br>Part 1. Variation of horsepower with altitude and compression ratio. H. C. Dickinson, W. S. James, and G. V. Anderson.<br>Part 2. Value of supercharging. H. C. Dickinson and G.V.Anderson.<br>Part 3. Variation of horsepower with temperature. H. C. Dickinson, W. S. James, and G. V. Anderson.<br>Part 4. Influence of water injection on engine performance. V. W. Brinkerhoff. |
| TR46* | A study of airplane engine tests. V. R. Gage. (1918) |
| TR47* | Power characteristics of fuels for aircraft engines. (1918)<br>Part 1. Power characteristics of aviation gasoline. E. W. Roberts.<br>Part 2. Power characteristics of Sumatra and Borneo gasolines. E. W. Roberts.<br>Part 3. Power characteristics of 20 per cent benzol mixtures. E. W. Roberts. |
| TR48* | Carbureting conditions characteristic of aircraft engines. P. S. Tice (1918) |
| TR49* | Metering characteristics of carbureters. P. S. Tice. (1918) |
| TR59* | General analysis of airplane radiator problems. H. C. Dickinson, W. S. James, and R. V. Kleinschmidt. (1919) |
| TR61* | Head resistance due to radiators. (1919)<br>Part 1. Head resistance of radiator cores. R. V.Kleinschmidt and S. R. Parsons.<br>Part 2. Preliminary report on resistance due to nose radiator. R. V. Kleinschmidt.<br>Part 3. Effect of streamline casing for free-air radiators. S. R. Parsons. |
| TR62* | Effect of altitude on radiator performance. W. S. James and S. R. Parsons. (1919) |

## AERONAUTIC POWER PLANTS (CONTINUED)

| Series No. | Title. |
|---|---|
| TR63* | Results of tests on radiators for aircraft engines. (1919)<br>Part 1. Heat dissipation of radiators. H. C. Dickinson, W. S. James, and R. V. Kleinschmidt.<br>Part 2. Water flow through radiator cores. W. S. James. |
| TR86* | Properties of special types of radiators. S. R. Parsons. (1920) |
| TR87* | Effects of nature of cooling surface on radiator performance. S. R. Parsons and R. V. Kleinschmidt. (1920). |
| TR88* | Pressure drop in radiator air tubes. S. R. Parsons. (1920). |
| TR89 | Comparison of Alcogas aviation fuel with export aviation gasoline. V. R. Gage, S. W. Sparrow, and D. R. Harper. (1920) 5¢ |
| TR90 | Comparison of Hector fuel with export aviation gasoline. H. C. Dickinson, V. R. Gage, and S. W. Sparrow. (1920) 5¢ |
| TR102* | Performance of a Liberty 12 airplane engine. S. W. Sparrow and H. S. White. (1920) |
| TR103* | Performance of a 300-horsepower Hispano-Suiza airplane engine. S. W. Sparrow and H. S. White. (1920) |
| TR106* | Turbulence in the air tubes of radiators for aircraft engines. S. W. Sparrow. (1920) |
| TR107 | A high-speed engine pressure indicator of the balanced diaphragm type. H. C. Dickinson and F. B. Newell. (1920) 5¢ |
| TR108* | Some factors of airplane engine performance. Victor R. Gage. (1920) |
| TR134* | Performance of Mayback 300-horsepower airplane engine. S.W. Sparrow. (1922) |
| TR135 | Performance of B.M.W. 185-horsepower airplane engine. S. W. Sparrow. (1922) 5¢ |
| TR158* | Mathematical equations for head conduction in the fins of air-cooled engines. D. R. Harper and W. G. Brown. (1922) |
| TR159* | Jet propulsion for airplanes. E. Buckingham. (1923) |
| TR189* | Relation of fuel-air ratio to engine performance. S.W. Sparrow. (1924) |
| TR190* | Correcting horsepower measurements to a standard temperature. S. W. Sparrow. (1924) |

## AERONAUTIC POWER PLANTS (Continued)

| eries No. | Title. |
|---|---|
| TR205* | The effect of changes in compression ratio upon engine performance. S. W. Sparrow. (1924) |
| TR232 | Fuels for high-compression engines. S. W. Sparrow. (1925) 10¢ |
| TR262 | Friction of aviation engines. S. W. Sparrow and M. A. Thorne. (1927) 10 |
| TR359 | An investigation of the effectiveness of ignition sparks. M. F. Peters, W. L. Summerville, and M. Davis. (1930) 10¢ |
| TN39* | High thermal efficiency in airplane service. S. W. Sparrow. (1920) |
| TN55* | Airplane crashes - engine troubles. A possible explanation. S. W. Sparrow. (1921) |
| TN108* | The use of multiplied pressures for automatic altitude adjustments. S. W. Sparrow. (1922). |
| TN210* | The testing of aviation engines under approximate altitude conditions. R. W. Dubois. (1924). |

he design of cooling surface for air-cooled engines. W. B. Brown. Automotive Industries. (56th & Chestnut Sts., Philadelphia, Pa.), vol. XLII, No. 24, p. 1352; June 10, 1920.

lying an airplane engine on the ground. S. W. Sparrow. S. A. E. Journal (29 W. 39th St., New York, N. Y.), vol. 6, No. 4, p. 239; April, 1920.

esign factors for airplane radiators. S. R. Parsons, S. A. E. Journal (29 W. 39th St., New York, N. Y.), vol. 6, No. 6, p. 437; June, 1920.

Compression ratio and thermal efficiency of airplane engines. S. W. Sparrow. S. A. E. Journal, (29 W. 39th St., New York, N. Y.), vol. 8, No. 5, p. 424; May, 1921.

adiators for aircraft engines. S. R. Parsons and D. R. Harper 3d. Journal of Washington Academy of Sciences (Washington, D. C.), vol. II, No. 17, p. 409; Oct. 19, 1921.

Condensation of water from engine exhaust for airship ballasting. R. F. Kohr. Air Service Information Circular (Aerostation), (Air Corps, Wright Field, Dayton, Ohio), vol. 1, No. 44; May 1, 1924.

Effect of altitude on engine power revealed by Bureau tests. Automotive Industries, (56th & Chestnut Sts., Philadelphia, Pa.), vol. L, No. 21, p. 1126; May 22, 1924.

## AERONAUTIC POWER PLANTS (Continued)

Heat transfer in the condensation of water from engine exhaust gas. R. F. Kohr and L. Butler. Journal of Industrial and Engineering Chemistry (810 - 18th St., N. W., Washington, D. C.), vol. 16, No. 9, p. 885; September, 1924.

Aviation engine performance. S. W. Sparrow. Journal of Franklin Institute (Philadelphia, Pa.), vol. 200, No. 6, p. 711; December, 1925.

Safety in a research laboratory. R. N. DuBois. Safety Engineering (119 Nassau St., New York, N. Y.), vol. 52, No. 1, p. 27; July 1,1926.

Laboratory and service tests for engine safety. H . C. Dickinson. Trans. 17th Annual Safety Conference (National Safety Council, New York, N. Y.), vol. 52, No. 1, pp. 444-448; October, 1928.

Development and testing of commercial aircraft engines from the point of view of safety and regulation. H. C. Dickinson. Proceedings, International Civil Aeronautics Conference, December 12-14, 1928. Sold by Superintendent of Documents, Government Printing Office, Washington, D. C., at 45 cents per copy.

Laboratory and service test for engine safety. H. C. Dickinson. Aeronautical World (1709 W. 8th St., Los Angeles, Calif.), January, 1929.

Commercial aircraft engines. H. C. Dickinson. Aero Digest (220 W. 42nd St., New York, N. Y.), vol. 14, No. 4, p. 102; April, 1929.

Type testing of commercial airplane engines of medium power. H. K. Cummings. Aeronautical Engineering (Transactions of American Society of Mechanical Engineers, 29 W. 39th St., New York, N. Y.), vol. 1, No. 2, p. 45; April-June, 1929.

Failures of aircraft engine parts and causes thereof. T. T. Neill. Proceedings, Amer. Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 30, Part II, p. 99; 1930.

Discussion: Failures of aircraft engine parts and causes thereof. L. B. Tuckerman. Proceedings, Amer. Society for Testing Materials (1315 Spruce St., Philadelphia, Pa.), vol. 30, Part II, p. 195; 1930.

The vapor locking tendency of aviation gasoline. O. C. Bridgeman and H. S. White. S. A. E. Journal, (29 West 39th St., New York, N. Y.), vol. 47, No. 2, p. 218; August, 1930.

Gasoline requirements of commercial aircraft engines. H. K. Cummings. S. A. E. Journal (29 W. 39th St., New York, N. Y.), vol. 47, No. 2, p. 212; August, 1930.

## AERONAUTIC POWER PLANTS (Continued)

The PROPERTIES OF GASOLINES WITH REFERENCE TO VAPOR LOCK. O. C. Bridgeman and E. W. Aldrich. S. A. E. Journal, (29 W. 39th St., New York, N. Y.), vol. 47, No. 1, p. 93; July, 1930.

The effect of airplane fuel-line design on vapor lock. O. C. Bridgeman and H. S. White. S. A. E. Journal (29 W. 39th St., New York, N. Y.), vol. 47, No. 4, p. 444; October, 1930.

Airplane fuel-line temperatures. O. C. Bridgeman, C. A. Ross, and H. S. White. S. A. E. Journal (29 W. 39th St., New York, N. Y.), vol. 49, No. 2, p. 121; August, 1931.

Altitude laboratory tests of aircraft engines. H. K. Cummings and E. A. Garlock. Aeronautical Engineering (American Society of Mechanical Engineers, 29 W. 39th St., New York, N.Y.). (In press.)

## AIRCRAFT INSTRUMENTS

| Series No. | Title. |
|---|---|
| T237 | Aeronautic instruments. F. L. Hunt. (1923) 20¢ |
| T247 | A new electrical telemeter. B. McCollum and O. S. Peters. (1924) 15¢ |
| T287 | A hot-wire anemometer for measuring air flow through engine radiators. Carl G. F. Zobel and L. B. Carroll. (1925) 5¢ |
| T320 | A fabric tension meter for use on aircraft. L. B. Tuckerman, G. H. Keulegan, and H. N. Eaton. (1926) 10¢ |
| T332 | Statical hysteresis inthe flexure of bars. G. H. Keulegan. (1926) 10¢. |
| T359 | A superheat meter or differential thermometer for airships. D. H. Strother and H. N. Eaton. (1927) 10¢ |
| RP78 | Relative visibility of luminous flashes from neon lamps and from incandescent lamps with and without red filters. F. C. Breckenridge and J. E. Nolan. (1929) 5¢ |
| RP222 | Thermometric lag of aircraft thermometers, thermographs, and barographs. H. B. Henrickson. (1930). 10¢ |
| M46 | War work of the Bureau of Standards. H. G. Boutell. (1921) 70¢ |
| Vibration board for testing aircraft instruments. W. G. Brombacher. Commercial Standards Monthly, vol. 7, p. 270; March, 1931. 10¢ | |
| M82 | Standard atmosphere chart. W. G. Brombacher. (1927) 5¢ |

AIRCRAFT INSTRUMENTS (Continued)

| Series No. | Title. |
|---|---|
| TN90* | Sylphon diaphragms. A method for predicting their performance for purposes of instrument design. H. N. Eaton and G.H. Keulegan. (1922) |
| TN261* | Tension experiments on diaphragm metals. H. B. Henrickson. (1927). |
| TR32 | The airplane tensiometer. L. J. Larson. (1918) 5¢ |
| TR110* | The altitude effect on air speed indicators. M. D. Hersey, F. L. Hunt, and H. N. Eaton. (1921) |
| TR125 | General classification of instruments and problems, including bibliography. M. D. Hersey. (1922) 5¢ |
| TR126 | Altitude instruments. (1922) 15¢<br>Part I. Altimeters and barographs. A. H. Mears, H. B. Henrickson, and W. G. Brombacher.<br>Part II. Precision altimeter design. J. B. Peterson and J. R. Freeman, jr.<br>Part III. Statoscopes and rate-of-climb indicators. A.H.Mears.<br>Part IV. Aerographs and strut thermometers. J.A.C.Warner. |
| TR127 | Aircraft speed instruments. (1922) 10¢<br>Part I. Air-speed indicators. F. L. Hunt.<br>Part II. Testing of air-speed meters. H. C. Stearns.<br>Part III. Principles of ground speed measurement. F.L. Hunt. |
| TR128 | Direction instruments. (1922) 15¢<br>Part I. Inclinometers and banking indicators. W. S. Franklin and M. H. Stillman.<br>Part II. The testing and use of magnetic compasses for airplanes. R. L. Sanford.<br>Part III. Aircraft compasses - Description and classification. J. A. C. Warner.<br>Part IV. Turn indicators. R. C. Sylvander and E. W. Rounds. |
| TR129 | Power plant instruments. (1922) 15¢<br>Part I. Airplane tachometers. G. E. Washburn.<br>Part II. Testing of airplane tachometers. R. C. Sylvander.<br>Part III. Thermometers for aircraft engines. E. F. Mueller and R. M. Wilhelm.<br>Part IV. Air pressure and oil pressure gages. H. N. Eaton.<br>Part V. Gasoline depth gages and flowmeters for aircraft. J. A. C. Warner. |
| TR130 | Oxygen instruments. F. L.Hunt. (1922) 10¢ |
| TR131 | Aerial navigation and navigating instruments. H. N. Eaton.(1922)10¢. |
| TR132 | Recent developments and outstanding problems. F. L. Hunt (1922) 5¢ |

## AIRCRAFT INSTRUMENTS (Continued)

| Series No. | Title. |
|---|---|
| TR156* | The altitude effect of air speed indicators. H. N. Eaton and W. A. MacNair. (1922) |
| TR165* | Diaphragms for aeronautic instruments. . M. Hersey. (1923) |
| TR198 | Astronomical methods in aerial navigation. K. H. Beij. (1925) 15¢ |
| TR206 | Non-metallic diaphragms for instruments. H. N. Eaton and C. T. Buckingham. (1925) 10¢ |
| TR246* | Tables for calibrating altimeters and computing altitudes based on the standard atmosphere. W. G. Brombacher. (1926) -- (Available as Letter-Circular No. 190, "Altitude-pressure tables based on the U. S. standard atmosphere," which may be obtained without charge on application to the Bureau of Standards, Washington, D.C.) |
| TR299 | Investigation of damping liquids for aircraft instruments. G. H. Keulegan. (1928) 10¢ |
| TR310 | Pressure element of constant logarithmic stiffness for temperature compensated altimeter. W. G. Brombacher and F. Cordero. (1929) 10¢ |
| TR358 | Temperature coefficient of the modulus of rigidity of aircraft instrument diaphragm and spring materials. W. G. Brombacher and E. R. Milton. (1930) 10¢ |
| TR371 | Present status of aircraft instruments. Sub-committee on instruments. (1930) 15¢ |
| TR398 | Investigation of damping liquids for aircraft instruments. II. W. R. Houseman and G. H. Keulegan. (1931) 15¢ |

Aeronautic instruments. M. D. Hersey. Trans., Amer. Society of Mechanical Engineers (29 W. 39th St., New York, N. Y.), vol. 42, p. 83; 1920.

The earth inductor compass. P. R. Heyl and L. J. Briggs. Proc., American Philosophical Society (104 S. Fifth St., Philadelphia, Pa.), vol. 51, p. 15; 1922.

Determination of the altitude of aircraft. W. G. Brombacher. Journal of Optical Society of America (care of Cornell University, Ithaca, N.Y.), vol. 7, p. 719; 1923.

Optical rate-of-climb recorders. Their uses, theory and description. A. H. Mears and D. H. Strother. Journal of Optical Society of America (care of Cornell University, Ithaca, N. Y.), vol. 8, p. 787; 1924.

New types of aircraft instruments. F. L. Hunt. Journal of Optical Society of America (care of Cornell University, Ithaca, N. Y.), vol. 12, p. 227; 192

AIRCRAFT INSTRUMENTS (Continued)

Aircraft instruments. H. N. Eaton, K. H. Beij, W. G. Brombacher, W. W. Frymoyer, H. B. Henrickson, C. L. Seward, and D. H. Strother. 269 pages. (1926) Tonald Press, New York, N. Y.

Lag of thermometers and thermographs for aircraft. H. Henrickson and W. G. Brombacher. Monthly Weather Review (Weather Bureau, Washington, D.C.) vol. 55, p. 72; 1927.

Record altitude flights. H. B. Henrickson. Aero Digest (220 W. 42nd St., New York, N. Y.), vol. 12; May, 1928.

A brief historical survey of airplane instruments. W. G. Brombacher and K.H. Beij. Popular Aviation (608 S. Dearborn St., Chicago, Ill.), vol. 3; December, 1928.

Endurance flights in 1928. H. B. Henrickson. Aero Digest (220 W. 42nd St., New York, N. Y.), p. 38; April, 1929.

Altitude flights in 1928. H. B. Henrickson. Aero Digest (220 W. 42nd St., New York, N. Y.), vol. 2, p. 39; 1929.

Electrical instruments for aircraft. V. E. Whitman. Electrical Manufacturing (461 Eighth Ave., New York, N. Y.), p. 32; August, 1929.

Recent developments in aircraft instruments. W. G. Brombacher. Trans., American Society of Mechanical Engineers (29 W. 39th St., New York, N. Y.), Aeronautical Engineering, vol. 1, p. 119; 1929.

Minimum temperature recording strut thermometer. H. B. Henrickson. Instruments (1117 Wolsendale St., Pittsburgh, Pa.), vol. 2, p. 323; 1929.

Flight test instruments. J. B. Peterson and E. W. Rounds. S. A. E. Journal (29 W. 39th St., New York, N. Y.), vol. 26, p. 313; March, 1930.

Duration flights during 1929. H. B. Henrickson. Aero Digest (220 W. 42nd St., New York, N. Y.), vol. 16, p. 64; April, 1930.

Performance of aneroid altimeters for landing and for level flying. Preprint for American Society of Mechanical Engineers (29 W. 39th St., New York N. Y.), Aeronautic meeting in Baltimore; May, 1931.

Altitude flights in 1930. H. B. Henrickson. Aero Digest (220 W. 42nd St., New York, N. Y.), Vol. 18, p. 42, and vol. 19, p. 36; June and July, 1931.

## AIDS TO AIR NAVIGATION

| Series No. | Title. |
|---|---|
| S341* | Airplane antenna constants. J. M. Cork. (1919) |
| S428 | The radio direction finder and its application to navigation. F. A. Kolster and F. W. Dunmore. (1922) 15¢ |
| S480 | A directive type of radio beacon and its application to navigation. F. H. Engel and F. W. Dunmore. (1924) 5¢ |
| RP19 | Receiving sets for aircraft beacon and telephony. H. Pratt and H. Diamond. (1928) 15¢ |
| RP28 | Design of tuned reed course indicators for aircraft radiobeacon. F. W. Dunmore. (1928) 5¢ |
| RP35 | Unidirectional radiobeacon for aircraft. E. Z. Stowell. (1928) 10¢ |
| RP77 | A course-shift indicator for the double-modulation type radiobeacon. H. Diamond and F. W. Dunmore. (1929) 5¢ |
| RP78* | Relative visibility of luminous flashes from neon lamps and from incandescent lamps with and without red filters. F. C. Breckenridge and J. E. Nolan. (1929) |
| RP148 | Applying the visual double-modulation type radio range to the airways H. Diamond. (1930) 10¢ |
| RP154 | A 12-course radio range for guiding aircraft with tuned reed visual indication. H. Diamond and F. G. Kear. (1930) 10¢ |
| RP155 | Applying the radio range to the airways. F. G. Kear and W. E. Jackson. (1930) 5¢ |
| RP158 | Engine-ignition shielding for radio reception in aircraft. H. Diamond and F. G. Gardner. (1930) 15¢ |
| RP159 | Development of the visual type airway radiobeacon system. J. H. Dellinger, H. Diamond, and F. W. Dunmore. (1930) 20¢ |
| RP160 | A tuned-reed course indicator for the 4 and 12 course aircraft radio range. F. W. Dunmore. (1930) 15¢ |
| RP238 | A radio beacon and receiving system for blind landing of aircraft. H. Diamond and F. W. Dunmore. (1930) 25¢ |
| RP313 | Characteristics of airplane antennas for radio range-beacon reception H. Diamond and G. L. Davies. (1931) 5¢ |
| RP330 | Automatic volume control for aircraft radio receivers. W. S. Hinman jr. (1931) 10¢ |

## AIDS TO AIR NAVIGATION (Continued)

Series No. Title.

RP336 A course indicator of pointer type for the visual radio range-beacon system. F. W. Dunmore. (1931) 15¢

RP338 Theory of design and calibration of vibrating reed indicators for radio range beacons. (1931) 10¢. G. L. Davies.

RP341 A simultaneous radiotelephone and visual range beacon for the airways F. G. Kear and G. H. Wintermute. (1931) 20¢

Applications of radio in air navigation. J. H. Dellinger. Engineers and Engineering (124 W. Polk St., Chicago, Ill.), vol. 43, p. 301; Nov., 1926. Mechanical Engineering (29 W. 39th St., New York, N. Y.), vol. 49, p. 29; January, 1927.

Apparent night variations with crossed-coil radio beacons. H. Pratt. Proc., Institute of Radio Engineers (33 W. 39th St., New York, N. Y.), vol. 16, p. 652; May, 1928.

Development of radio aids to air navigation. J. H. Dellinger and H. Pratt. Proc. Institute of Radio Engineers (33 W. 39th St., New York, N. Y.), vol. 16, p. 890; July, 1928.

Bibliography on aircraft radio. C. B. Joliffe and E. M. Zandonini. Proc., Institute of Radio Engineers (33 W. 39th St., New York, N. Y.), vol. 16, p. 985; July, 1928.

Directional radio as an aid to safe flying. J. H. Dellinger. Papers of Seventeenth Annual Safety Congress. National Safety Council (Washington, D. C.) p. 564; Oct. 4, 1928. Aeronautical World (1709 West 8th St., Los Angeles, Calif.), vol. 2, p. 20; February, 1929.

Uses of radio as an aid to navigation on fixed airways. J. H. Dellinger. Papers of International Civil Aeronautics Conference (Government Printing Office, Washington, D. C., $1.00), p. 595; December 12-14, 1928.

Directional radio as a transport safety factor. J. H. Dellinger. Aeronautical World (1709 W. 8th St., Los Angeles, Calif.), vol. 2, p. 20; February, 1929

Uses of radio as an aid to air navigation. J. H. Dellinger. Journal, American Institute Electrical Engineers (33 W. 39th St., New York, N. Y.), vol. 48, p. 105; February, 1929.

Field intensity characteristics of double-modulation type of directive radio beacon. H. Pratt. Proc., Institute of Radio Engineers, (33 W. 39th St., NewYork, N. Y.), vol. 17, p. 873; May, 1929.

Airway beacons. F. C. Breckenridge. Aero Digest (220 W. 42nd St., New York, N. Y.), p. 76; June, 1929.

## AIDS TO AIR NAVIGATION (Continued)

A radio system for flying and landing aircraft in fog. H. Diamond and F. W. Dunmore. Proceedings, National Academy of Sciences ( Washington, D. C.), vol. 16, No. 11, p. 678; November, 1930.

Airplanes land blind - guided by radio. H. Diamond and F. W. Dunmore. Scientific American (24 W. 40th St., New York, N. Y.), vol. 145, p. 20; July, 1931.

Transmission of light through fog. F. C.Breckenridge. Proceedings, International Commission on Illumination, 1931 meeting in Cambridge, England. Transactions, Illuminating Engineering Society (29 W. 39th St. New York, N. Y.) vol. 27; February, 1932. Aircraft Engineering (London, England), vol. 3, p. 261; 1931.

## MISCELLANEOUS

| Series No. | Title. |
|---|---|
| T128 | Effect of solar radiation upon balloons. J. D. Edwards and M. B. Long (1919) 5¢ |
| C81 | A bibliography of the scientific literature relating to helium. (1922) 10¢ |
| M46 | War work of the Bureau of Standards. H. G. Boutell. (1921) 70¢ |
| M82 | Standard atmosphere chart. (Altitude-pressure curves) W. G. Brombacher (1927) 5¢ |
| TR40 | The ferrosilicon process for the generation of hydrogen. E. R. Weaver W. M. Berry, and V. T. Bohnson. (1918) 15¢ |
| TR160 | An airship slide rule. E. R. Weaver and S. F. Pickering. (1923) 5¢ |

The significance of oxygen in baloon gas. J. D. Edwards and P. G. Leidig. Aviation (330 W. 42nd St., New York, N. Y.), p. 325; April 15, 1919.

Inflammability of jets of hydrogen and inert gases. P. G. Leidig. Industrial and Engineering Chemistry (Washington, D. C.), vol. 12, p. 1098; 1920.

Production of hydrogen by the thermal decomposition of oil. E. R. Weaver. Chemical and Metallurgical Engineering (330 W. 42nd St., New York, N. Y.), April 30, May 28, and June 18, 1923.

Making airships safe. L. B. Tuckerman. Scientific Monthly (Grand Central Terminal New York, N. Y.), vol. XXIII, p. 74; July, 1926.

Technical aspects of the loss of the SHENANDOAH. Journal of the American Society of Naval Engineers (Navy Department, Washington, D. C.), vol. XX, No. 3; August 3, 1926.