

## Contributors to this Issue

W. H. HARDEN, B.E.E., University of Michigan, 1912; Engineering Department, American Telephone and Telegraph Company, 1912-1919; Department of Operation and Engineering, 1919—. Mr. Harden has been engaged in the development of transmission maintenance testing methods and in the preparation of routines and practices required for applying these methods in the telephone plant.

JOHN R. CARSON, B.S., Princeton, 1907; E.E., 1909; M.S., 1912; Research Department, Westinghouse Electric and Manufacturing Company; 1910-12; instructor of physics and electrical engineering, Princeton, 1912-14; American Telephone and Telegraph Company, Engineering Department, 1914-15; Patent Department, 1916-17; Engineering Department, 1918; Department of Development and Research, 1919—. Mr. Carson's work has been along theoretical lines and he has published several papers on theory of electric circuits and electric wave propagation.

W. H. MARTIN, A.B., Johns Hopkins University, 1909; S.B., Massachusetts Institute of Technology, 1911. American Telephone and Telegraph Company, Engineering Department, 1911-19; Department of Development and Research, 1919—. Mr. Martin's work has related particularly to loading, quality, and transmission of telephone sets and local circuits.

C. W. SMITH, B.S.E., University of Michigan, 1916; Chicago Telephone Company, 1916-20; American Telephone and Telegraph Company, Engineering Department and Department of Operation and Engineering, 1920—.

RAY S. HOYT, B.S. in electrical engineering, University of Wisconsin, 1905; Massachusetts Institute of Technology, 1906; M.S., Princeton, 1910. American Telephone and Telegraph Company, Engineering Department, 1906-07. Western Electric Company, Engineering Department, 1907-11; American Telephone and Telegraph Company, Engineering Department, 1911-19; Department of Development and Research, 1919—. Mr. Hoyt has made contributions to the theory of transmission lines and associated apparatus, and more recently to the theory of crosstalk and other interference.

KARL K. DARROW, S.B., University of Chicago, 1911; University of Paris, 1911-12; University of Berlin, 1912; Ph.D., in physics and mathematics, University of Chicago, 1917; Engineering Department, Western Electric Company, 1917—. At the Western Electric, Mr. Darrow has been engaged largely in preparing studies and analyses of published research in various fields of physics.

H. H. NANCE, Washington University, 1906-10; Long Lines Plant Department, 1910-23; district plant chief, 1917-18; division superintendent of equipment construction, 1919-20; division engineer, 1920-23; Long Lines Engineering Department, acting engineer of transmission, 1923; engineer of transmission, 1924.

J. W. HORTON, B.S., Massachusetts Institute of Technology, 1914; instructor in physics, 1914-16; Engineering Department of the Western Electric Company, 1916—. Mr. Horton has been closely connected with the development of apparatus for carrier current communication.