

## The Contributors to this Issue

OTTO J. ZOBEL, A.B., Ripon College, 1909; A.M., Wisconsin, 1910; Ph.D., 1914; Instructor in physics, 1910-15; instructor in physics, Minnesota, 1915-16; Engineering Department, American Telephone and Telegraph Company, 1916-19; Department of Development and Research, 1919—. Mr. Zobel has made important contributions to circuit theory in branches other than the subject of wave-filters.

J. N. KIRK, B.S., Purdue University, 1905; Engineering Department, New York Telephone Company, 1905-11; Plant Engineer for Texas, Southwestern Bell Telephone Company, 1912; Outside Plant Engineer, 1913-16; Engineering Department, American Telephone and Telegraph Company, 1917-19; Outside Plant Engineer, Department of Operation and Engineering, 1920—.

A. B. CLARK, B.E.E., University of Michigan, 1911; American Telephone and Telegraph Company, Engineering Department, 1911-19; Department of Development and Research, 1919—. Mr. Clark's work has been connected with toll telephone and telegraph systems.

GEORGE A. CAMPBELL, B.S., Massachusetts Institute of Technology, 1891; A.B., Harvard, 1892; Ph.D., 1901; Gottingen, Vienna and Paris, 1893-96; Mechanical Department, American Bell Telephone Company, 1897; Engineering Department, American Telephone and Telegraph Company, 1903-19; Department of Development and Research, 1919—; Research Engineer, 1908—. Dr. Campbell has published papers on loading and the theory of electric circuits, including electric wave-filters, and is also well known to telephone engineers for his contributions to repeater and substation circuits.

J. E. HARRIS, A.B., University of Michigan, 1908; M.S., 1909; Ph.D., 1911; instructor in general and physical chemistry, 1911-17; Engineering Department, Western Electric Company, 1917—. Mr. Harris has been connected with the development of the oxide coated filament used in the manufacture of vacuum tubes.

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