

**AIEE WINTER
MEETING**
January 27-31, 1947



PROGRAM

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INSPECTION TRIPS
ENTERTAINMENT
ELECTRICAL SHOW



ENGINEERING SOCIETIES BUILDING
33 West 39th St. • New York 18, N. Y.

GENERAL INFORMATION

The technical program, the largest in the history of the Institute, is a manifestation of expanding technical activities to cover the field more completely. This is evidenced further by the holding of a special conference on technical activities. As an innovation, the Edison, John Fritz, and Hoover Medals will be presented in general sessions in the afternoons, coordinated with technical sessions appropriate to the fields of achievements of the medalists.

Please register promptly on arrival at the meeting. A registration fee of \$2 will be charged all nonmembers, except Enrolled Students and the immediate families of members. Registration will be strictly enforced by the showing of badges for admission to technical sessions.

Information on all features may be obtained at the registration desk. Press headquarters will be in Room 1016. The Institute rooms and offices on the tenth floor of the Engineering Societies Building are open to members.

Efforts will be made to deliver telegrams and messages promptly. Members who expect to receive mail during the meeting are asked to collect same promptly at mail and telegram desk. Please check this desk frequently.

Broadcast Tickets have been obtained for many of the principal broadcasts on various evenings during the week. These are available at the entertainment desk. Some prior reservations of Theatre Tickets are still available.

Technical Sessions and Discussions are governed by the "Conduct of Technical Sessions" at the discretion of the presiding officer. Usually 10 minutes will be allowed for the presentation of each paper and 5 minutes for each discussion. To receive consideration for publication discussions must be left with the chairman or sent to C. S. Rich, AIEE, 33 West 39th Street, New York 18, N. Y., before *Feb. 14*. Discussions received later will be returned. The original, typewritten, double-spaced copy, complete with original illustrations and two carbon copies with photostats or blueprints, should be submitted.

Authors and discussers should make their presentations as effective as possible. Remember the audience. Speak distinctly so as to be heard in the rear of the room. Stress the salient features of the paper which are new or novel, and illustrate the advantages of your methods. When using slides, please turn toward the audience before speaking and raise your. Extemporaneous delivery is preferable to reading unless done slowly and emphasis is put in the proper places.

Advance Copies of Technical Papers may be purchased by members at the registration desk or at Institute headquarters at prices indicated. Nonmember prices 100% more than listed or by mail 100% more than mail price less 5¢ on each paper. Only numbered papers are available. Coupon books in \$5.00 denominations are available for those who wish to avoid remittance by check or otherwise. Most of the papers ultimately will be published as AIEE Proceedings and in the TRANSACTIONS.

SCHEDULE OF EVENTS

For Entertainment, Inspection Trips, and Electrical Show, See Separate Folder

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
<p>9:30 A.M. Light Traction (Auditorium)</p> <p>Automatic Stations (Room 502)</p> <p>Metallic Rectifiers (Room 501)</p> <p>Conference of Student Branch Counselors (Room 503)</p>	<p>9:30 A.M. Protective Devices (Auditorium)</p> <p>Electronic Instruments (Room 502)</p> <p>Diesel-Electric Locomotives (Room 503)</p> <p>Conference on Power Supply for Resistance Welding (Room 501-A)</p> <p>Servomechanisms (Room 501-B and C)</p>	<p>9:30 A.M. Conference on Energy Sources (Auditorium)</p> <p>Industrial Control Devices (Room 503)</p> <p>Conference on Distribution Circuit Protection (Room 502)</p> <p>Conference on Some New Electronic Devices and Methods (Room 501)</p>	<p>9:30 A.M. Board of Directors Mtg. (Room 1001)</p> <p>Applications in the Textile Industry (Auditorium)</p> <p>Conference on Aircraft Safety (Room 502)</p> <p>Basic Sciences (Room 503)</p> <p>Conference on Interconnected Systems (Room 501)</p>	<p>9:30 A.M. Symposium on Lightning (Auditorium)</p> <p>Electric Machinery (Room 501)</p> <p>Symposium on Grounding Portable Electric Equipment (Room 502)</p>

<p>2:00 P.M. Electronics (Auditorium)</p> <p>Electric Railways (Room 503)</p> <p>Conference on Applied Mathematics (Room 501)</p> <p>Conference on Technical Activities (Room 502)</p>	<p>1:45 P.M. General Session Edison Medal Presentation (Auditorium)</p> <p>2:30 P.M. Television and Demonstrations (Auditorium)</p> <p>Power Relays (Room 502)</p> <p>Instruments and Measurements (Room 501-B and C)</p> <p>Resistance Welding (Room 503)</p> <p>Conference on Statistical Methods (Room 501-A)</p> <p>5:30 P.M. Smoker (Hotel Commodore)</p>	<p>1:45 P.M. General Session John Fritz Medal Presentation (Auditorium)</p> <p>2:30 P.M. Symposium on Limitations of Light Production (Auditorium)</p> <p>Hydroelectric Systems (Room 501-B and C)</p> <p>Symposium on Rural Telephone Facilities (Room 502)</p> <p>Conference on Industrial Voltages (Room 501-A)</p> <p>Electric Machinery (Room 503)</p>	<p>1:45 P.M. General Session Hoover Medal Presentation (Auditorium)</p> <p>2:30 P.M. Directors Mtg.—cont. (Room 1001)</p> <p>Conference on Large-Scale Computing Devices (Auditorium)</p> <p>Industrial Power Applications (Room 501)</p> <p>Conference on Aircraft Safety (Room 502)</p> <p>Conference on Testing Telephone Receivers and Transmitters (Room 503)</p>	<p>2:00 P.M. Power Transmission (Auditorium)</p> <p>Industrial Instrumentation and Control (Room 502)</p> <p>Electric Machinery (Room 503)</p> <p>Communications and Components and Techniques (Room 501)</p>
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Monday, January 27

8:30 a.m.—Registration.

9:30 a.m.—Light Traction

Auditorium
W. A. BRECHT, Presiding

Address: "Rapid Transit Plans for New York." Major General Charles P. Gross, Chairman, Board of Transportation, N. Y. City Transit Sys.

47-43. Modern Car Equipment for New York City's Subway System. B. F. Cordts, N. Y. City Transit Sys. 10 cents (by mail 15 cents).

47-44. Special Ten-Car Train for the New York City Transit System. J. J. Sinclair, N. Y. City Transit Sys. 10 cents (by mail 15 cents).

47-45. Can the Trolley Coach Compete Economically with the Gas or Diesel Bus Where No Overhead Facilities Exist? J. H. Gauss, General Elec. Co. 10 cents (by mail 15 cents).

9:30 a.m.—Automatic Stations

Room 502
GEORGE S. WHITLOW, Presiding

47-51. Automatic Control of Air Switches for Line Sectionalizing and Load Transfer. F. W. Rich, M. S. Kirwen, The Commonwealth and Southern Corp. Presentation by title. 15 cents (by mail 20 cents).

47-54. Automatic Switching Schemes for Capacitors. W. H. Cuttino, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).

47-55. The Economics of Using Capacitors in Amounts to Require Automatic Switching. J. W. Butler, General Elec. Co. 15 cents (by mail 20 cents).

9:30 a.m.—Metallic Rectifiers

Room 501
E. A. HARTY, Presiding

47-34. The Physics of Electronic Semi-Conductors. G. L. Pearson, Bell Telephone Labs., Inc. 15 cents (by mail 20 cents).

47-25. Higher Voltage Copper Oxide Rectifiers. I. R. Smith, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).

47-26. Electrical Characteristics of the Junction in a Simplified Selenium Rectifier Cell. S. J. Angello, Univ. of Penna. 15 cents (by mail 20 cents).

47-27. Automatically Controlled Copper-Oxide Rectifiers for Electroplating and Anodizing Applications. J. J. Buckley, General Elec. Co. 10 cents (by mail 15 cents).

**CP. Discussion of Report on Proposed Definitions for Metallic Rectifiers. Subcommittee on Metallic Rectifiers.

**CP. Report on Bibliography of Metallic Rectifiers. Subcommittee on Metallic Rectifiers.

9:30 a.m.—Conference of Student Branch Counselors

Room 503
J. F. CALVERT, Presiding

Demonstration of a film and talk which might be used before Student Branches in support of membership efforts. Tomlinson Fort, Chairman, Membership Committee.

2:00 p.m.—Electronics

Auditorium
C. H. WILLIS, Presiding

47-68. The Shunt Tube Control of Thyatron Rectifiers. J. A. Potter, Bell Tel. Labs., Inc. 10 cents (by mail 15 cents).

47-69. Electronic Constant Current Motor Systems. O. W. Livingston, General Elec. Co. 15 cents (by mail 20 cents).

**CP. Sealed Ignitrons for Power Rectifiers. W. E. Pakala, C. R. Marcum, Westinghouse Elec. Corp.

47-71. Arc-Back Testing of Graphite. W. E. Pakala, C. J. Cucullu, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).

2:00 p.m.—Electric Railways

Room 503
W. A. BRECHT, Presiding

47-8. Developments in Current Collectors for High-Speed Service. B. F. Langer, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).

47-41. Some Recent Developments in the P.C.C. Car. S. B. Cooper, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).

47-42. Recent Developments in Track Brakes and Drum Brakes for P.C.C. Cars. S. J. Vouch, General Elec. Co. 10 cents (by mail 15 cents).

47-53. Investigation of Silicone Insulation on High Temperature Railway Motor. George Grant III, T. A. Kauppi, Dow-Corning Corp.; G. L. Moses, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).

over

Eta Kappa Nu Dinner

Eta Kappa Nu's "Kary" dinner will be held at 6:30 Monday evening, January 27 at the Building Trades Employers' Association's Dining Room, 2 Park Avenue, New York.

Professor V. Karapetoff, Professor Emeritus of Electrical Engineering, Cornell University, will speak on "Into the Fourth Dimension by the Back Door." The subject will be treated in a manner understandable to the ladies and they are cordially invited.

Price of dinner is \$3.00.

Columbia Engineers Dinner

The annual informal dinner for Columbia Electrical Engineers will be held at the Men's Faculty Club, 400 West 117 Street, Monday, January 27, 6:30 p.m. Mr. Walter S. Lemmon, President, World Wide Radio Foundation, Inc., will speak on his experiences in International Communications. Price of dinner is \$2.20.

2:00 p.m.—Conference on Applied Mathematics in Cooperation with the American Mathematical Society

Room 501
MICHEL G. MALTI, Presiding

- **CP. Introductory Remarks. Dr. Michel G. Malti, Cornell Univ.
- **CP. Automatic Electronic Computers. Dr. John von Neumann, Inst. for Adv. Study, Princeton, N. J.
- **CP. Fluid Flow Patterns. Dr. Garrett Birkhoff, Harvard Univ.
- **CP. Probability As Applied to Some Electrical Engineering Problems. Dr. Mark Kac, Cornell Univ.
- **CP. Applications of the Differential Analyzer. C. Concordia, General Elec. Co.

2:00 p.m.—Conference on Technical Activities

Room 502
MORRIS D. HOOVEN, Presiding

The President and the Technical Activities Subcommittee of the Committee on Planning and Coordination will review and discuss the organization and handling of the technical activities of the Institute.

General Review of the Work of the Technical Activities Subcommittee. Chairman Hooven.

Communication and Science Group. W. R. G. Baker.

General Applications Group. S. G. Hibben.

Industry Group. H. Speight.

Power Group. M. J. Steinberg.

Cooperation with Districts. H. M. Turner.

Cooperation with Sections. G. W. Bower.

Significance of Technical Work to the Institute. President Housley.

Tuesday, January 28

9:30 a.m.—Protective Devices

Auditorium
H. J. LINGAL, Presiding

- 47-59. The Interruption of Charging Current at High Voltage. W. M. Leeds, R. C. Van Sickle, Westinghouse Elec. Corp. 25 cents (by mail 30 cents).
- 47-6. Resistors for 133-Kv Cable Switching. E. K. Sadler, Kelman Elec. and Mfg. Co.; T. M. Blakeslee, Dept. of Water and Power, City of Los Angeles. 20 cents (by mail 25 cents).
- 47-50. An Improved Automatic Circuit Recloser. J. M. Wallace, Westinghouse Elec. Corp. (10 cents (by mail 15 cents)).
- 47-60. Sectionalizing and Internal Transformer Fusing on Rural Power Circuits. B. O. Watkins, Rural Elec. Adm. 20 cents (by mail 25 cents).

9:30 a.m.—Electronic Instruments

Room 502
W. R. CLARK, Presiding

- 47-86. Pulse Echo Measurements on Telephone and Television Facilities. L. G. Abraham, A. W. Lebert, J. B. Maggio, J. T. Schott, Bell Tel. Labs., Inc. 15 cents (by mail 20 cents).
- 47-84. A Magnetic Compass with Cathode-Ray Sensing Element. W. H. Kliever, R. R. Syrdal, Minneapolis-Honeywell Reg. Co. 15 cents (by mail 20 cents).
- 47-85. Electronic Null Detectors for Use with Impedance Bridges. H. W. Lamson, General Radio Co. 10 cents (by mail 15 cents).
- 47-13. The Cathode-Ray Spectrograph. Rudolf Feldt, Carl Berkley, Allen B. DuMont Labs., Inc. 10 cents (by mail 15 cents).

9:30 a.m.—Diesel-Electric Locomotives

Room 503
W. A. BRECHT, Presiding

- 47-36. A 3000-Hp Diesel-Electric Locomotive for the Seaboard Air Line Railway. D. R. Staples, Baldwin Locomotive Works; T. L. Weybrew, C. A. Atwell, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).
- 47-37. Developments in Diesel-Electric Traction Generator Excitation Control Systems. C. A. Brancke, G. M. Adams, General Elec. Co. 10 cents (by mail 15 cents).
- 47-38. Braking Resistors and Control for Diesel-Electric Locomotives. E. F. Weiser, General Elec. Co. 10 cents (by mail 15 cents).
- 47-39. A Power Plant Regulating System for Diesel-Electric Locomotives. C. B. Lewis, General Elec. Co. 10 cents (by mail 15 cents).
- 47-40. Developments in Control Systems for Diesel-Electric Locomotives. M. D. Henshaw, General Elec. Co. 15 cents (by mail 20 cents).

9:30 a.m.—Conference on Power Supply for Resistance Welding

Room 501-A
C. N. CLARK, Presiding

- **CP. Resistance Welding, a Beneficial Load. N. J. Roberts, Ohio Public Serv. Co.
- **CP. Co-operative Approach to Power Supply for Resistance Welders. H. W. Tietze, Public Serv. Elec. and Gas Co.
- **CP. Our Methods of Servicing Resistance Welder Loads. R. E. Young, J. E. Renbush, Public Serv. Co. of Northern, Ill.
- **CP. Application Engineers Role in Insuring Adequate Power Supply for Resistance Welders. K. W. Ostrom, Nat. Elec. Welding Mach. Co.
- **CP. New Fields for Stored Energy Welding. A. C. Johnson, Progressive Welder Co.

Tuesday - continued

9:30 a.m.—Servomechanisms

Room 501-B and C
GORDON S. BROWN, Presiding

- 47-7. The Application of Lead Networks and Sinusoidal Analysis to Automatic Control Systems. G. J. Schwartz, Arma Corp. 25 cents (by mail 30 cents).
- 47-12. A Comparison of Two Basic Servomechanisms Types. Herbert Harris, Sperry Gyroscope Co., Inc. 25 cents (by mail 30 cents).
- 47-15. Dimensionless Analysis of Servomechanisms by Electrical Analogy—II. G. D. McCann, Calif. Inst. of Tech.; S. W. Herwald, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).
- 47-52. Laboratory Aids for Electromechanical System Development. G. C. Newton, Jr., W. T. White, Sperry Gyroscope Co. 10 cents (by mail 15 cents).

1:45 p.m.—General Session

Auditorium

Edison Medal Presentation to Lee de Forest.

Presiding: J. Elmer Housley, President, American Institute of Electrical Engineers.

The Origin of the Edison Medal. S. M. Dean, Chairman, Edison Medal Committee.

Address: David Sarnoff, President, Radio Corporation of America.

Presentation of Medal: President Housley.

Response: Lee de Forest.

2:30 p.m.—Television and Demonstrations

Auditorium
C. B. JOLLIFFE, Presiding

- 47-72. Television Equipment for Broadcast Stations. W. L. Lawrence, RCA. 20 cents (by mail 25 cents).
- 47-73. Post War Television Receiver Design. D. W. Pugsley, General Elec. Co. 10 cents (by mail 15 cents).
- **CP. Color Television Receivers. P. C. Goldmark, G. R. Tingley, CBS.
- 47-75. A New Microwave Television System. J. F. Wentz, K. D. Smith, Bell Tel. Labs., Inc. 15 cents (by mail 20 cents).
- 47-74. Television Network Facilities. L. G. Abraham, Bell Tel. Labs., Inc.; H. I. Romnes, American Tel. and Tel. Co. 10 cents (by mail 15 cents).

2:30 p.m.—Power Relays

Room 502
W. R. BROWNLEE, Presiding

- 47-65. Grounding of Instrument Transformer Secondary Circuits. Working Group on Grounding of Instrument Transformer Secondary Circuits, Relay Subcommittee, H. R. Paxson, Sponsor. 10 cents (by mail 15 cents).

- **CP. Simplicity in Transformer Protection. E. T. B. Gross, III. Inst. of Tech.

- 47-66. Fundamental Basis for Distance Relaying on 3-Phase Systems. W. A. Lewis, III. Inst. of Tech.; L. S. Tippett, Westinghouse Rosebery Proprietary, Ltd. 25 cents (by mail 30 cents).
- 47-67. Experience with Single-Pole Relaying and Reclosing on a Large 132-Kv System. J. J. Trainor, C. E. Parks, Public Serv. Co. of Ind., Inc. 15 cents (by mail 20 cents).

2:30 p.m.—Instruments and Measurements

Room 501-B and C
TRUMAN S. GRAY, Presiding

- 47-104. Airborne Magnetometers for Search and Survey. E. P. Felch, W. J. Means, T. Slonczewski, Bell Tel. Labs., Inc.; L. H. Rumbaugh, Naval Ordnance Laboratory; L. G. Parratt, Cornell Univ.; A. J. Tickner, Western Elec. Co., Inc. 25 cents (by mail 30 cents).
- 47-11. The Calibration of Ignition Crest Voltmeters. W. L. Davis, Battelle Memorial Inst.; C. E. Warren, Ohio State Univ. 10 cents (by mail 15 cents).
- 47-22. Advancements in the Design of Long-Scale Indicating Instruments. R. M. Rowell, N. P. Millar, General Elec. Co. 15 cents (by mail 20 cents).
- 47-23. Measurement of High Q Cavities at 10,000 MC. R. W. Lange, Bell Tel. Labs., Inc. 15 cents (by mail 20 cents).
- 47-24. A Polyphase Thermal Ampere Demand Meter. A. J. Petzinger, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).

2:30 p.m.—Resistance Welding

Room 503
G. W. GARMAN, Presiding

- 47-61. Voltage Changes Due to Resistance Welding Loads. I. B. Johnson, H. A. Peterson, C. M. Rhoades, General Elec. Co. 25 cents (by mail 30 cents).
- 47-62. The Voltage Drop in the Welder Throat Loaded with Ferromagnetic Materials. G. M. Stein, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).
- 47-63. Electric Characteristics of Resistance Welding Tools. E. M. Callender, The Budd Co. 25 cents (by mail 30 cents).
- 47-64. Functionalized Resistance Welding Control. C. B. Stadum, W. E. Large, E. C. Hartwig, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).

2:30 p.m.—Joint Conference on Statistical Methods with the American Society for Quality Control

Room 501-A
W. P. DOBSON, Presiding

- **CP. The American Society for Quality Control—Its Objectives and Its Progress to Date. George D. Edwards, President, American Society for Quality Control.
- **CP. Statistics Applied to Consumer Goods. E. E. Folsom, General Elec. Co.
- **CP. Application of Statistical Methods in Industry. A. J. Winterhalter, Colonial Radio Corp.

5:30 p.m.—Smoker, Hotel Commodore

Tickets \$7.50 each. Tables accommodate 6, 8, and 10.

Wednesday, January 29

9:30 a.m.—Conference on Energy Sources

Auditorium
J. D. TEBO, Presiding

The first of a series of conferences on methods of producing electric power will be sponsored by the Committee on Basic Sciences. The great impetus given to new methods of supplying electric power by developments in nuclear energy has suggested that all known methods of producing electric power should be reviewed in the light of present-day knowledge. For purposes of classification, the known means of electric energy generation have been divided into the following ten classes: electromagnetic, thermoelectric, electrostatic, electrochemical, piezoelectric, contact electricity, emission phenomena, pyroelectric, magnetostrictive, and earth potential. At this conference a survey paper will describe the various phenomena and three of the ten classes, namely, emission phenomena, piezoelectric phenomena, and electrostatic phenomena will be discussed by outstanding experts in their respective fields. At later conferences other phases of this broad problem will be discussed by well-known authorities.

- **CP. A Survey of Methods of Producing Electric Power. L. W. Matsch, Armour Research Foundation.
- **CP. Emission Phenomena. Dr. L. A. DuBridg, President, California Inst. of Tech.
- **CP. Piezoelectric Phenomena. Dr. Walter G. Cady, Professor of Physics, Wesleyan Univ.
- **CP. Electrostatic Phenomena. John G. Trump, Associate Professor of Elec. Engg., Mass. Inst. of Tech.

9:30 a.m.—Industrial Control Devices

Room 503
E. U. LASSEN, Presiding

- 47-17. Shading Coil Calculations for Single-Phase Magnets. C. T. Evans, Cutler-Hammer, Inc. 10 cents (by mail 15 cents).
- 47-19. A Thruster Lowering Control System for A-C Crane Hoists. E. L. Schwarz-Kast, Armour Research Foundation. 15 cents (by mail 20 cents).
- 47-20. Dynamic Braking by Self-Excitation of Squirrel-Cage Motor. A. Srinivasan, Ill. Inst. of Tech.; M. A. Thomas, New Mexico State College. 10 cents (by mail 15 cents).
- 47-21. Dynamic Braking of a Single D-C Series Motor. J. D. Leitch, The Elec. Cont. and Mfg. Co. 10 cents (by mail 15 cents).

9:30 a.m.—Conference on Distribution Circuit Protection, Construction, Service Continuity, and Fault Records

Room 502
G. B. DODDS, Presiding

Distribution circuit protection practices and construction methods will be the subject of a conference which will emphasize the influence of these factors on the reduction of sustained faults on distribution systems. This conference is sponsored jointly by the Relay Subcommittee of the Committee on Protective Devices and by the Distribution Subcommittee of the Committee on Power Transmission and Distribution.

The service continuity requirements of distribution circuits is becoming more important because of the increased commercial.

domestic and rural uses of electricity. Outages other than those of a short duration may cause serious inconvenience especially where electric power is used for purposes including cooking, heater control, milking machines, milk cooling, etc. Efforts to effect service improvements through reduction in the number of sustained faults have been concentrated sometimes on protection practices and others on construction methods. A joint subcommittee with Mr. C. B. Dodds as chairman is studying the problem from both standpoints. Introductory conference papers will be presented after which discussion from the floor will be invited. It is hoped to develop interchange of experience data which will also be of value to the joint subcommittee in continuing their investigations. Methods of recording and correlating interruption data will be emphasized.

- **CP. Some Means for Reducing Service Outages. H. P. Seeley, The Detroit Edison Co.
- **CP. 4Kv Fuse Coordination. R. M. Havourd, Public Serv. Elec. & Gas Co.

9:30 a.m.—Conference on Some New Electronic Devices and Methods

Room 501
W. C. WHITE, Presiding

- **CP. Electronic Dynamometer Control for Automotive Testing. E. F. Kubler, H. T. Gayek, General Elec. Co.
- **CP. The Electroflash. H. J. McCarthy, Sylvania Elec. Products, Inc.
- **CP. The Beam Travelling-Wave Tube. J. R. Pierce, Bell Tel. Labs., Inc.
- **CP. A Novel Application of Dielectric Heating in the Furniture Industry. J. M. Cage, Raytheon Mfg. Co.
- **CP. High Frequency Welding, William Parker, Victor Div., RCA.

1:45 p.m.—General Session

Auditorium

John Fritz Medal Presentation to Dr. L. W. Chubb

Presiding: Malcolm Pirnie, Member of the Board of Award.

Address: M. W. Smith, Vice-President, Westinghouse Electric Corp.

Presentation of Medal: N. E. Funk, Chairman of the Board of Award.

Response: L. W. Chubb.

2:30 p.m.—Symposium on Limitations of Light Production

Auditorium
S. G. HIBBEN, Presiding

- **CP. Incandescent Illuminants. R. G. Slauer, Sylvania Elec. Products, Inc.
- **CP. Vapor Lamp or Discharge Sources. Dr. H. C. Rentschler, Westinghouse Elec. Corp.
- **CP. Fluorescent Sources. R. N. Thayer, General Elec. Co.

over

2:30 p.m.—Hydroelectric Systems

Room 501-B and C
M. J. STEINBERG, Presiding

- 47-56. Testing Governor Performance on Electric Power Systems with Improved Instruments. J. E. Allen, Penna. Water and Pr. Co.; W. B. Hess, Safe Harbor Water Pr. Corp. 25 cents (by mail 30 cents).
- 47-57. Automatic Control of Hydroelectric Generating Stations. M. J. Brown, W. A. Derr, Westinghouse Elec. Corp. 25 cents (by mail 30 cents).
- 47-58. Modern Bearing Practice for Vertical Water Wheel Generators. C. M. Laffoon, R. A. Baudry, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).
- **CP. Characteristics of Hydraulic Turbines That Effect Operating Efficiency. J. F. Roberts, Allis-Chalmers Mfg. Co.

2:30 p.m.—Rural Telephone Facilities

Room 502
F. A. COWAN, Presiding

- 47-80. A Carrier Telephone System for Rural Service. J. M. Barstow, Bell Tel. Labs., Inc. 25 cents (by mail 30 cents).
- 47-81. Application of Rural Carrier Telephone System. E. H. B. Bartelink, General Tel. Corp.; L. E. Cook, Ebasco Services, Inc.; F. A. Cowan, American Tel. and Tel. Co.; G. R. Messmer, Rural Elec. Adm. 15 cents (by mail 20 cents).
- 47-82. Joint Use of Pole Lines for Rural Power and Telephone Services. J. W. Campbell, American Tel. and Tel. Co.; L. W. Hill, Carolina Tel. and Tel. Co.; L. M. Moore, Rural Elec. Adm.; H. J. Scholz, Commonwealth and South. Corp. 25 cents (by mail 30 cents).
- **CP. Open-Wire Construction for Rural Telephone Lines. C. G. Sinclair, Jr., American Tel. and Tel. Co.; D. M. Barnes, Assoc. Tel. Co., Ltd.; F. V. Haskell, Bell Tel. Labs., Inc.
- 47-83. Rural Radiotelephone Experiment at Cheyenne Wells, Colorado. J. H. Moore, American Tel. and Tel. Co.; P. K. Seyler, The Mountain States Tel. and Tel. Co.; S. B. Wright, Bell Tel. Labs., Inc. 10 cents (by mail 15 cents).

2:30 p.m.—Conference on Industrial Voltages

Room 501-A
C. C. WHIPPLE, Presiding

- **CP. Report of Subcommittee on Industrial Voltage Requirements. Presentation by a member of the subcommittee.
- **CP. Voltage Regulation for Industrial Systems. R. C. R. Schulze, American Gas and Elec. Serv. Corp.; D. L. Beeman, General Elec. Co.; H. G. Barnett, Westinghouse Elec. Corp.; W. H. Dickinson, Standard Oil Dev. Co.

2:30 p.m.—Electric Machinery

Room 503
E. S. BROWN, Presiding

- 47-10. Simplified Graphical Method of Computing Thermal Transients. Paul Narbutovskih, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).
- 47-9. The Dielectric Properties of Cellulose Insulation Impregnated with Semi-Conductor Liquids. F. M. Clark, General Elec. Co. 15 cents (by mail 20 cents).
- 47-16. A Study of the Relative Severity of Steep-Front Waves and Chopped Waves on Transformers. F. J. Vogel, III. Inst. of Tech. 10 cents (by mail 15 cents).

Thursday, January 30**9:30 a.m.—Applications in the Textile Industry**

Auditorium
PHILIP BLISS, Presiding

- 47-103. Power Distribution in Textile Plants. J. D. McConnell, Proximity Mfg. Co. 10 cents (by mail 15 cents).
- 47-35. Electric Equipment for Two-for-One Twister. E. C. Gwaltney. *ACO. H. J. Burnham, Saco-Lowell Shops. 10 cents (by mail 15 cents).
- 47-32. Electric Drives for Textile Finishing Ranges. R. B. Moore, *ACO. H. C. Uhl, General Elec. Co. 25 cents (by mail 30 cents).
- 47-33. Electrification of the Cotton Industry in the South. S. A. Bobe, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).

9:30 a.m.—Conference on Aircraft Safety

Factors Affecting Safe Operation of Electric Apparatus

Room 502
F. M. ROBERTS, Presiding

1. Safety, History and Requirements.
Leader: F. B. Kemery or A. A. Gray, CAA.

Prepared Discussion:

- | | |
|------------------------------------|----------------------------|
| A. Standards today | D. Evaluation of weight. |
| B. Present needs and requirements. | E. Definition of failures. |
| C. Trends in operation and design. | |

2. Types of Electrical Failures.

Leader: C. R. Moore, Douglas Aircraft Co.

Prepared Discussion:

- | | |
|--|------------------------------|
| A. Loss of Power Source. | E. Fire. |
| B. Loss of power at important load center. | F. Smoke. |
| C. Electric apparatus failures. | G. Hydraulic considerations. |
| D. Driven machine failures. | |

3. Protection in the Electric System.

Leader: R. J. Lusk, Westinghouse Elec. Corp.

Prepared Discussion:

- | | |
|------------------------------|---|
| A. Definition of Protection. | |
| 1. Preventative. | 2. Consequence limiting. |
| B. Power Source Protection. | |
| 1. Generators. | 3. Regulators. |
| 2. Leads. | 4. Relays. |
| C. Distribution System. | |
| 1. Cables. | 3. Automatic protective system. |
| 2. Protective relays. | 4. Multiple channel or dual power supply. |
| D. Utilization Equipment. | |
| 1. Relays. | 3. Wiring connectors, installation. |
| 2. Design considerations. | |

9:30 a.m.—Basic Sciences

Room 503
J. D. TEBB, Presiding

- 47-1. Eddy Currents in Disks: Driving and Damping Forces and Torques. A. D. Moore, Univ. of Mich. 25 cents (by mail 30 cents).
- 47-18. A 60-Cycle Hysteresis-Loop Tracer for Small Samples of Low-Permeability Material. D. E. Wiegand, W. W. Hansen, III. Sch. of Tech. 25 cents (by mail 30 cents).
- 47-87. Machine Computation of Power Network Performance. L. A. Dunstan, Federal Pr. Comm. 25 cents (by mail 30 cents).

over

Thursday - continued

- 47-88. Effective Resistance of Isolated Nonmagnetic Rectangular Conductors. H. B. Dwight, Mass. Inst. of Tech. 10 cents (by mail 15 cents).
- 47-2. Theory and Application of Complex Logarithmic and Geometric Mean Distances. T. J. Higgins, Ill. Inst. of Tech. 15 cents (by mail 20 cents).

9:30 a.m.—Conference on Interconnected Systems

Room 501

M. J. STEINBERG, Presiding

- **CP. Some Technical and Political Aspects of Interconnected System Operation. S. B. Morehouse, Leeds and Northrup Co.
- **CP. Interconnected Systems Operations, Planning, and Performance. Robert Pierce, Ebasco Services, Inc.
- 47-4. Theoretical Approach to Speed and Tie-Line Control. Robert Brandt, New England Power Company. 10 cents (by mail 15 cents).
- **CP. The Maintenance of Hydroelectric Generating Units. A. S. Robertson, R. O. Standing, Ontario Hydro Elec. Comm.

1:45 p.m.—General Session

(Auditorium)

Hoover Medal Presentation to Dr. Vannevar Bush

Presiding: Scott Turner, Chairman, Hoover Medal Board of Award.

Address: E. L. Moreland, Executive Vice-President, Massachusetts Institute of Technology.

Presentation of Medal: Scott Turner.

Response: Vannevar Bush.

2:30 p.m.—Conference on Large-Scale Computing Devices

(Auditorium)

C. CONCORDIA, Presiding

This subject is at present of great interest to many prospective users in government, industry, and the universities. The development, both during and since the war, has been tremendous, so that although many people are familiar in a general way with the fact that such computers have been and will be made, the status and field of usefulness of the various types and what to expect in the near future is largely a matter of speculation. For this reason the committee has arranged for the following talks by men from each of the six leading centers of digital computer development to cover (1) the present status of developments, and (2) the probable future trends.

- **CP. Commander H. H. Aiken, in charge of the Automatic Sequence-Controlled Calculator at the Cruft Lab., Harvard Univ.
- **CP. Julian Bigelow, Chief Engr. of the computer project at the Inst. for Adv. Study, Princeton Univ.
- **CP. J. W. Forrester, in charge of a computer project at the Servomechanisms Lab., Mass. Inst. of Tech.
- **CP. J. C. McPherson, Dir. of Engg., Int. Business Mach. Corp.
- **CP. T. K. Sharpless of the Moore School of Elec. Engg., Univ. of Penna.
- **CP. S. B. Williams, Con. Engr., formerly with Bell Tel. Labs.

2:30 p.m.—Industrial Power Applications

Room 501

S. F. FRENCH, Presiding

- 47-28. An Analysis of Motor Selection for Brass-Slab Rolling-Mill Service. L. H. Berkley, Engr. Training Center, Fort Belvoir, Va. 15 cents (by mail 20 cents).
- **CP. Aluminum Ore Distribution Systems. R. T. Woodruff, Aluminum Ore Company.
- 47-31. A Selective Grounding System. E. Herzog, U. S. Army Air *ACO. Forces. 10 cents (by mail 15 cents).
- 47-29. An Extension of Impact Speed Drop Analysis. F. E. Crever, General Elec. Co. 20 cents (by mail 25 cents).
- 47-30. Cathodic Protection of Steel Water Tanks Using Aluminum Anodes. L. P. Sudrabin, Electro Rust-Proofing Corp.; R. B. Mears, Aluminum Co. of America. 10 cents (by mail 15 cents).

2:30 p.m.—Conference on Aircraft Safety (continued)

Room 502

J. D. MINER, Presiding

- 47-14. An Integrated Control System for Aircraft Direct-Current Generators. A. T. McClinton, Naval Research Laboratory. 10 cents (by mail 15 cents).
- 47-5. Parallel Operation of Aircraft Alternators Using Electronic Frequency Changers. O. E. Bowlus, P. T. Nims, Chrysler Corp. Presentation by Title. 20 cents (by mail 25 cents).

4. Application Considerations.

Leader:

Prepared Discussion:

A. Environment:

- | | |
|-----------------|-----------------|
| 1. Moisture | 3. Altitude |
| 2. Ventilation. | 4. Temperature. |

B. Loading.

- | | |
|-----------------------|-----------------|
| 1. Load analysis. | 3. Duty cycles. |
| 2. Machine selection. | 4. Ratings. |

C. Installation.

D. Radio Noise.

5. Safety Program.

Leader: R. A. Averitt, General Elec. Co.

Prepared Discussions:

A. Practical Specifications

B. Subcommittee Report on Systems Guide.

C. Test Procedure Program.

D. Simplification and Integration of Devices.

6. General Discussion.

Leader: T. B. Holliday, Mueller Accessories.

over

2:30 p.m.—Conference on Testing Telephone Receivers and Transmitters

Room 503

ARTHUR BESSEY SMITH, Presiding

- **CP.1. General introduction by the chairman.
From the standpoint of users.
- **CP.2. A general view, Dr. Leo L. Beranek, Cruft Laboratory, Harvard University.
- **CP.3. U. S. Army, Raoul A. Faralla, Electrical Engineer, Chief of Acoustic Branch, Signal Corps Engineering Laboratory.
- **CP.4. U. S. Navy, P. M. Barzilaski, Supervisor of Communication and Electronics Section, Brooklyn Navy Yard.
From the standpoint of instrument testing apparatus.
- **CP.5. W. L. Tuffnell, Engineer, Bell Telephone Laboratories, Inc.
From the standpoint of manufacturers.
- **CP.6. George H. Brodie, Research Engineer, Kellogg Switchboard & Supply Co.
- **CP.7. W. A. Codd, Engineer, Stromberg-Carlson Co.
- **CP.8. Harry A. Pearson, Assistant Director, Research and Engineering, Sonotone Corporation.
- **CP.9. L. C. Pocock, Engineer, Standard Telephones and Cables, London.
- **CP.10. H. C. Pye, Development Engineer, Automatic Electric Co.

General discussion.

Friday, January 31

9:30 a.m.—Symposium on Lightning

Auditorium

R. J. WISEMAN, Presiding

- 47-97. Field Investigation of Lightning Surges at Substations. I. W. Gross, American Gas and Elec. Serv. Corp.; G. D. McCann, Calif. Inst. of Tech. 15 cents (by mail 20 cents).
- 47-98. Photographic Study of Lightning. J. H. Hagenguth, General Elec. Co. 20 cents (by mail 25 cents).
- 47-99. Field Research on Lightning Arrester Discharges. G. D. McCann, Calif. Inst. of Technology; Edward Beck, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).
- 47-49. Burning of Wood Structures by Leakage Currents. P. M. Ross, Ohio Brass Co. 15 cents (by mail 20 cents).

9:30 a.m.—Electric Machinery

Room 501

C. P. POTTER, Presiding

- 47-3. Equivalent Circuit of the Primitive Machine with Asymmetrical Stator and Rotor. Gabriel Kron, General Elec. Co. 15 cents (by mail 20 cents).
- 47-94. Accuracy of Temperature Measurements on Coil Surfaces. H. M. Beede, B. M. Gain, General Elec. Co. 10 cents (by mail 15 cents).
- 47-100. The Magnetomotive Force of Two-Layer Windings. J. M. Stein, Westinghouse Elec. Corp. 10 cents (by mail 15 cents).
- 47-95. Liquid Cooling of A-C Turbine Generators. C. J. Fechheimer, Consulting Engr. 25 cents (by mail 30 cents).

9:30 a.m.—Symposium on Grounding of Portable Electric Equipment

Room 502

L. F. ADAMS, Presiding

The enormous increase in the use of portable electric tools and other equipment in manufacturing establishments makes it highly important that engineers concerned with the development, use, and maintenance of such equipment be well informed as to the need for safeguarding and methods of accomplishing it.

Report on Grounding of Portable Equipment. Committee on Article 250, Grounding, of the Electrical Committee, NFPA. (Copy complimentary)

- **CP. Discussion of the report to be presented by producers, installers, and users of connecting cord and plug equipment involved in such grounding.

2:00 p.m.—Power Transmission

Auditorium

R. J. WISEMAN, Presiding

- 47-89. Meteorological Engineering for the Electric Utilities. H. A. *ACO. Downs, U. S. Dept. of Comm. 10 cents (by mail 15 cents).
- 47-90. The Transient-Energy Method of Calculating Stability. P. C. Magnusson, Oregon State Col. 25 cents (by mail 30 cents).
- 47-91. Internal Corona Discharges in Insulated Cables. E. W. Greenfield, Anaconda Wire and Cable Co. 25 cents (by mail 30 cents).
- 47-92. Radio-Noise Influence of 230-Kv Lines. H. L. Rorden, Bonneville Pr. Adm. 10 cents (by mail 15 cents).

2:00 p.m.—Industrial Instrumentation and Control

Room 502

HERBERT SPEICHT and M. MICHEL, Presiding

- 47-47. Radar Technique in Industrial Control. W. D. Cockrell, General Elec. Co. 10 cents (by mail 15 cents).
- 47-48. A Balanced Amplifier Using Biased Saturable Core Reactors. H. S. Kirschbaum, The Ohio State Univ.; E. L. Harder, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).
- **CP. Notes on Circuit Breaker Protection for Industrial Equipment, R. R. McGee, The Trumbull Elec. Mfg. Co.
- 47-46. Use of Electric Gages in Quality Control. Joseph Manuele. *ACO. Westinghouse Elec. Corp. 10 cents (by mail 15 cents).
- **CP. The Influence of Electronics on Industrial Instrumentation. H. D. Middel, General Elec. Co.

2:00 p.m.—Electric Machinery

Room 503

M. S. OLDACRE, Presiding

- 47-93. New NEMA Fractional Horsepower Motor Standards; Their Effect of Refrigeration and Pump Application. C. P. Potter, Wagner Elec. Corp. 10 cents (by mail 15 cents).
- 47-101. The Equivalent Circuit of the Capacitor Motor. S. S. L. Chang, Robbins and Myers, Inc. 25 cents (by mail 30 cents).
- 47-102. A Design Method for Capacitor Motors. T. C. Lloyd. S. S. L. Chang, Robbins and Myers, Inc. 25 cents (by mail 30 cents).
- 47-96. The Multistage Rototrol. M. M. Liwshitz, Polytechnic Inst. of Brooklyn. 15 cents (by mail 20 cents).

2:00 p.m.—Communications Components and Techniques

Room 501

J. J. PILLIOD, Presiding

- 47-76. The Stromberg-Carlson XY Dial Telephone System. H. R. Reed, Stromberg-Carlson Co. 15 cents (by mail 20 cents).

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- 47-77. Gas Pressure for Telephone Cables. R. C. Giese, American Tel. and Tel. Co. 20 cents (by mail 25 cents).
- 47-78. Frequency Shift Telegraphy—Radio and Wire Applications. J. R. Davey, A. L. Matte, Bell Tel. Labs., Inc. 25 cents (by mail 30 cents).
- 47-79. Some Modern Techniques in Ocean Cable Telegraphy. C. H. Cramer, Western Union Tel. Co. 20 cents (by mail 25 cents).

*ACO: Advance copies only available; not intended for publication in TRANSACTIONS.

**CP: Conference paper; no advance copies are available; not intended for publication in TRANSACTIONS.

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COMMITTEE MEETINGS

Sunday, January 26

10:00 a.m.—Planning and Coordination 1001

Monday, January 27

9:30 a.m.—Working Group on Ling. Prot. of Substa. Units . . . 1105
10:00 a.m.—Applications of Electricity to Therapeutics 1001
10:30 a.m.—Collective Bargaining 903
2:00 p.m.—Automatic Stations. . . . ASCE Board Room, 15th Floor
2:00 p.m.—Cir. Breakers and Assembled Switchgear Subcom. . 1101
2:00 p.m.—Subcommittee on Fault Limiting Devices. 1105
2:00 p.m.—Project Gr.—Est. Lightning Perf. of Trans.
Lines Alcove, 11th Floor
2:00 p.m.—Subcommittee on Metallic Rectifiers 817
2:30 p.m.—Joint Subcommittee on Servomechanisms 1001
2:30 p.m.—Working Gr. on Fuses Above 600 V., AIEE
Std. No. 25 903
4:00 p.m.—Subcommittee on Switches, Fuses, and Insulators . 903

Tuesday, January 28

9:00 a.m.—Transformer Subcommittee 903
9:30 a.m.—Lamme Medal 1001
9:30 a.m.—Communication ASCE Board Room, 15th Floor
9:30 a.m.—Subcomm. on Int. Wiring Design for Comm. Bldgs. . 1101
10:00 a.m.—Registration of Engineers 1105
2:00 p.m.—Membership 1001
2:00 p.m.—Sections ASCE Board Room, 15th Floor
2:00 p.m.—Insulation Resistance Subcommittee. 903
2:00 p.m.—Lightning Protective Devices Subcommittee. . . . 817
2:30 p.m.—Working Group on Inter. Switches. . . Alcove, 11th Floor
3:00 p.m.—Basic Sciences 1105
4:00 p.m.—Relay Subcommittee 1101

Wednesday, January 29

8:30 a.m.—Induction Machinery Subcommittee 817
9:30 a.m.—Nominating Committee 1001
9:30 a.m.—Joint Subcommittee on Carbon Brushes 1101
9:30 a.m.—Subcommittee on Aircraft Elec. Rotating Mach. . . 1105
9:30 a.m.—Special Committee on Institute Prizes 903
10:30 a.m.—Synchronous Machinery Subcommittee. 817
11:30 a.m.—Finance Committee 1001
1:00 p.m.—Sub.comm. for Revision of Std. No. 4 (ASA C68) . 1001
2:00 p.m.—Joint Subcomm. on Electronic Instruments. . . . 1101
2:00 p.m.—Working Group on Sens. Ground Fault Protection . 1105
2:30 p.m.—Industrial Control Devices 903
2:30 p.m.—Safety 817
2:30 p.m.—Coord. of Constr. and Prot. of Distribution Circuits
4 Irving Place, Room 1449-S
4:00 p.m.—Protective Devices 1001

Thursday, January 30

9:00 a.m.—Electronics ASCE Board Room, 15th Floor
9:00 a.m.—D-C Machinery Subcommittee 1101
9:30 a.m.—Board of Directors 1001
9:30 a.m.—Communications Subcommittee, C42 1105
9:30 a.m.—Electrochemistry and Electrometallurgy 903
10:00 a.m.—Publication 817
10:00 a.m.—Lightning & Insulator Subcom. . . . Alcove, 11th Floor
12:30 p.m.—Power Generation—Luncheon. . . . Engrs. Club,
2:00 p.m.—Electric Machinery 1101
2:00 p.m.—Towers, Wood Poles, and Cond. Alcove, 11th Floor
2:30 p.m.—Board of Directors 1001
2:30 p.m.—Education ASCE Board Room, 15th Floor
2:30 p.m.—Working Gr. on Rev. of Trans. Dielectric Tests . . 1105

Friday, January 31

9:30 a.m.—Hot-Cathode Rectifiers Working Group 1001
9:30 a.m.—Basic Principles of Altitude Rating 903