

**AIEE
WINTER GENERAL
MEETING**



PROGRAM

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entire meeting*



See separate folder for
INSPECTION TRIPS
and
ENTERTAINMENT



**Pittsburgh, Pa.
January 26-30
1948**

Meeting Headquarters
WILLIAM PENN HOTEL

FUTURE AIEE MEETINGS

*Closing Date
for Papers*

Conference on Electron Tubes for Instrumentation and Industrial Use

Benjamin Franklin Hotel, Philadelphia, Pa.
March 29-31, 1948

Great Lakes District Meeting

Des Moines, Iowa, April 1-3, 1948

North Eastern District Meeting

New Haven, Conn., April 28-30, 1948

Summer General Meeting

Sessions in Palace of Fine Arts, Mexico City
June 21-25, 1948

Pacific General Meeting

Spokane, Washington, August 24-27, 1948

Middle Eastern District Meeting

Hotel Statler, Washington, D. C.
October 5-7, 1948

Midwest General Meeting

Schroeder Hotel, Milwaukee, Wis.
October 18-22, 1948

Southern District Meeting

Birmingham, Alabama, November 3-5, 1948

* Required so papers can be reviewed, revised, and sent to Mexico for printing in Spanish in advance.

Because great interest has been shown in the Summer General Meeting to be held in Mexico City, June 21-25, Travelogue pictures in color will be shown in the Ball Room, 1:30 to 2:00 p.m., Monday, Tuesday, Wednesday, and Thursday.

GENERAL INFORMATION

The Program features electrical applications in the mining and steel industries. Other sessions treat subject matter practically throughout the entire range of Institute technical activities. Inspection trips have been co-ordinated with the technical sessions. The Edison Medal will be presented in a general session, at which a feature talk of interest to many members will be given. On the social side, a Smoker, Dinner-Dance, and Ladies' Entertainment program have been arranged. Most sessions and meeting activities will be on the 17th floor except those scheduled for the Pittsburgh Room, which is on the basement floor level.

Please register promptly in the Silver Room on arrival at the meeting. A registration fee of \$2 will be charged all nonmembers, except members of the AISE, AMC, MHS who have been invited to take part in the industry group sessions; enrolled students and the immediate families of members.

Information on all features may be obtained at the registration desk. Press headquarters will be in Parlor G. For committee meetings see page 24 and for meeting features see pages 21 and 22.

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.

Technical Sessions and Discussions are governed by the "Conduct of Technical Sessions" at the discretion of the presiding officer. Insofar as possible papers will be presented in the order of the program to facilitate hearing other papers in parallel sessions. 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. 13*. Discussions received later will be returned. Separate discussions on each paper should be submitted as discussions on groups of papers are not acceptable. 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 voice. 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

Monday, January 26

- 9:00 a.m.—Registration
- 9:30 a.m.—Electronic and Resistance Heating
- 9:30 a.m.—Applications in the Steel Industry
- 9:30 a.m.—Relays
- 9:30 a.m.—Instruments for Radiation Measurements
- 9:30 a.m.—Symposium on New Materials
- 1:30 p.m.—Trip to Copperweld Steel Co.
- 1:30 p.m.—Trip to Tidd 500 Kv Test Lines
- 2:00 p.m.—Power Supply to Steel Mills
- 2:00 p.m.—Industrial Control
- 2:00 p.m.—Relay Protection of Transmission Lines
- 2:00 p.m.—Transformers
- 2:00 p.m.—Electronic Instruments
- 6:30 p.m.—Eta Kappa Nu Recognition Dinner

Tuesday, January 27

- 9:30 a.m.—Trip to Pittsburgh Plate Glass Co.
- 9:30 a.m.—Trip to Springdale Power Plant
- 9:30 a.m.—Steel
- 9:30 a.m.—Material Handling
- 9:30 a.m.—Switchgear I
- 9:30 a.m.—Rotating Machinery
- 9:30 a.m.—Electronics
- 9:30 a.m.—Symposium on Railroad Electrification
- 1:30 p.m.—Trip to Irvin Steel Works
- 2:00 p.m.—Machine Tools
- 2:00 p.m.—Switchgear II
- 2:00 p.m.—Telemetering
- 2:00 p.m.—High-Frequency Measurements
- 2:00 p.m.—Heavy Traction
- 2:00 p.m.—Some New Electronic Devices and Applications
- 6:30 p.m.—Dinner-Smoker
- 7:00 p.m.—Ladies' Dinner

Wednesday, January 28

- 10:00 a.m.—General Session
- 1:30 p.m.—Trip to Westinghouse E. Pittsburgh Works
- 1:30 p.m.—Trip to Dravo Shipyard
- 2:00 p.m.—Power Distribution in Steel Mills and Mines
- 2:00 p.m.—Transmission and Distribution
- 2:00 p.m.—Distr. Cir. Prot., Constr., Serv. Continuity and Fault Rec.
- 2:00 p.m.—Basic Sciences
- 2:00 p.m.—Communication Components and Techniques
- 2:00 p.m.—Light Traction
- 7:00 p.m.—Dinner-Dance

Thursday, January 29

- 9:30 a.m.—Board of Directors Meeting
- 9:30 a.m.—Trip to 66-Kv 10,000 Kva Series Capacitor Installation
- 9:30 a.m.—Power Distribution in the Mining and Glass Industry
- 9:30 a.m.—Metallic Rectifiers
- 9:30 a.m.—Arc Welding
- 9:30 a.m.—Extra-High-Voltage Cable Systems
- 9:30 a.m.—Conference on Applied Mathematics
- 9:30 a.m.—Facsimile and Picture Transmission
- 12:30 p.m.—Board of Directors Luncheon
- 1:00 p.m.—Trip to Alcoa Research
- 1:30 p.m.—Trip to Bureau of Mines Expl. Test Station
- 2:00 p.m.—Resistance Welding
- 2:00 p.m.—Conference on Mechanical Rectifiers
- 2:00 p.m.—Fault Limiting Devices
- 2:00 p.m.—Symposium on Electrical Network Theory
- 2:00 p.m.—Magnetic Recording
- 2:00 p.m.—Conference on Safety

Friday, January 30

- 9:30 a.m.—General Applications to Mining
- 9:30 a.m.—Electrothermal Processes
- 9:30 a.m.—Excitation and Speed Governing
- 9:30 a.m.—Conference on Substations
- 9:30 a.m.—Servomechanisms and Measurements
- 9:30 a.m.—Synthetic Crystals
- 1:30 p.m.—Trip to Tidd 500 Kv Test Lines
- 2:00 p.m.—Electric Cables in Mines
- 2:00 p.m.—General System Engineering
- 2:00 p.m.—Industrial Control
- 2:00 p.m.—Radio Relay Systems
- 2:00 p.m.—Symposium on Electric House Heating

WINTER GENERAL MEETING COMMITTEES

General

- C. A. Powel, *Chairman*
- C. T. Sinclair, *Vice-Chairman*
- L. N. Grier, *Sec.-Treasurer*
- H. S. Fitch
- Paul Frederick
- J. R. MacGregor
- A. C. Monteith

Entertainment

- M. S. Angier, *Chairman*
- J. P. Barton
- J. S. Brown
- R. B. Fulton
- L. E. Hemeter
- R. C. McKee
- L. E. Olmstead
- W. H. Osterle
- M. E. Reagan

Finance

- R. L. Dunlap, *Chairman*
- E. W. Aestereich
- W. A. Furst
- L. N. Grier
- H. A. P. Langstaff

G. W. Penney

Hotels

- C. M. Skooglund, *Chairman*
- J. A. Cadwallader
- R. J. Weber

Inspection and Transportation

- A. A. Johnson, *Chairman*
- W. A. Albert
- E. W. Brewer
- F. W. Cramer
- H. M. Foss
- V. E. Hill
- C. A. Jensen
- C. L. Jordan
- H. H. Marsh
- N. A. Mowry
- George Phillips

B. E. Rector

Meetings and Papers

- R. C. Gorham, *Chairman*
- F. S. Brown
- H. E. Chisholm
- C. B. Downer
- L. H. Hemeter

Publicity

- M. Getting, Jr., *Chairman*
- D. L. Hemenway
- R. J. Salsbury
- C. F. Nagel

Registration and Information

- B. M. Jones, *Chairman*
- J. W. Batchelor
- W. C. Bowen
- C. N. Clark
- G. B. Dodds
- C. V. Fields
- C. H. Jensen
- F. D. Marston
- E. S. Reeser
- F. E. Reiber
- H. H. Wagner

S. L. Woolley

Women's Entertainment

- Mrs. G. A. Price, *Chairman*
- Mrs. R. L. Dunlap
- Mrs. H. S. Fitch
- Mrs. Paul Frederick
- Mrs. M. Getting
- Mrs. R. C. Gorham
- Mrs. L. N. Grier
- Mrs. A. A. Johnson
- Mrs. B. M. Jones
- Mrs. J. R. MacGregor
- Mrs. C. T. Sinclair
- Mrs. C. M. Skooglund

Monday, January 26

9:00 a.m.—Registration

Silver Room

9:30 a.m.—Electronic and Resistance Heating

Cardinal Room

G. W. SCOTT, Jr., Presiding

- *CP. Measurement of Interference from Radio-Frequency Heating Equipment. G. H. Brown, RCA.
- *CP. Shielding of Electronic Heating Equipment. G. W. Klingaman, RCA.
- 48-10. F.C.C. Diathermy Design for Low-Harmonic Radiation and Good Frequency Stability. E. W. Chapin, W. K. Roberts, M. C. Mobley, Jr., Federal Communications Comm. 15 cents (by mail 20 cents).
- 48-17. Some Economic Aspects of Radio Frequency Heating. L. M. Duryee, The Connecticut Lt. and Pr. Co. 30 cents (by mail 35 cents).
- *CP. Simple Means for the Prediction of Generator Performance in Induction Heating. Eugene Mittelman, Consulting Engr. and Physicist.
- *CP. Industrial Electric Resistance Heating. L. P. Hynes, Elec. and Mech. Engr.

9:30 a.m.—Applications in the Steel Industry

Ball Room

F. W. CRAMER and J. D. LEITCH, Presiding

- 48-100. An X-Ray Thickness Gage for Hot-Strip Rolling Mills. C. W. Clapp, R. V. Pohl, General Elec. Co. 20 cents (by mail 25 cents).
- 48-14. X-Ray Thickness Gage for Cold Rolled Strip Steel. W. N. Lundahl, Westinghouse Elec. Corp. 25 cents (by mail 30 cents).
- *CP. Pin Hole Detectors for the Steel Industry. M. D. Bassett, L. U. C. Kelling, General Elec. Co.

9:30 a.m.—Relays

Urban Room

W. R. BROWNLEE, Presiding

- 48-6. Bibliography of Relay Literature 1944-1946. Project Committee on Relay Bibliography. 20 cents (by mail 25 cents).
- 48-12. Relaying Difficulties Disclosed by Staged Fault Tests. W. A. Morgan, Byron Evans, Bureau of Reclamation. 25 cents (by mail 30 cents).
- 48-13. Service Restoration with Automatic Air Break Switches. K. N. Reardon, West Penn Power Co. 20 cents (by mail 25 cents).

9:30 a.m.—Instruments for Radiation Measurements

Adonis Room

G. W. DUNLAP, Presiding

- *CP. High-Speed Counters. J. L. Lawson, General Elec. Co.
- *CP. Crystal Counters. R. Hofstader, Princeton Univ.
- *CP. Photomultipliers. J. W. Coltman, Westinghouse Elec. Corp.
- *CP. GM Counters. L. F. Curtiss, Natl. Bureau of Stds.
- *CP. Vibrating Reed Electrometer. Harold Forstat, Argonne Labs.

9:30 a.m.—Symposium on New Materials

Forum Room

C. G. SUITS, Presiding

- *CP. Magnetic Oxides. F. G. Brockman, Philips Labs., Inc.
- *CP. Development of High Permeability Iron. G. W. Elmen, E. A. Gaugler, Naval Ordnance Lab.

Dielectrics

- *CP. Properties of Dielectrics Composed of Titenates of the Alkaline Earth Oxide. G. R. Shelton, Natl. Bureau of Stds.

Insulation

- *CP. New Polymers for Electrical Insulation. J. R. Perkins, E. I. du Pont de Nemours, Plastics Dept.
- *CP. Polyester Resins as Electrical Insulation. C. F. Hill, N. C. Foster, Westinghouse Research Lab.
- *CP. Sulphur Hexafluoride. J. T. Pinkston, The Harshaw Chemical Co.
- *CP. Silicone Rubber for Electrical Uses. R. O. Sauer, General Elec. Co.
- *CP. Silicone Insulation for Electrical Uses. T. A. Kauppi, Dow-Corning Corp.
- *CP. Permafil for Electrical Applications. J. A. Loritsch, General Elec. Co.
- *CP. Synthetic Rubber as Cable Insulation. J. T. Blake, Simplex Wire & Cable Co.
- *CP. New Plastic Materials for Electrical Industry. M. C. Caine, Monsanto Chemical Co.
- *CP. CEROC Teflon. Stanley Dorst, Sprague Elec. Co.

Specialties

- *CP. The Welding of Glass with a High Frequency Electric Torch. E. M. Guyer, Corning Glass Works.

Semi-Conductors

- *CP. Rectification Properties of Silicon and Germanium. J. H. Scaff, Bell Tel. Labs.

1:30 p.m.—Trip to Copperweld Steel Co.

1:30 p.m.—Trip to Tidd 500-Kv Test Lines

2:00 p.m.—Power Supply to Steel Mills

Ball Room

D. L. BEEMAN, Presiding

- *CP. Electric Power for Industrial Plants. F. D. Troxel, Sargent and Lundy.
- *CP. Economics of Process Steam Generation. Mr. Zelle, John A. Roeblings and Sons.
- 48-15. Suddenly Applied Loads Carried by a Variable Ratio Synchronous-Induction Frequency Changer. A. G. Darling, General Elec. Co.; G. A. Kaufman, Jones and Laughlin Steel Corp. 15 cents (by mail 20 cents).
- *CP. Effect of Load Swings on Frequency and Tie-Line Load Control. T. E. Purcell, Duquesne Light Co.

over

Monday - continued

2:00 p.m.—Industrial Control

Forum Room
J. D. LEITCH, Presiding

- 48-98. The Liquid Rheostat for Speed Control of Wound-Rotor Induction Motors. G. L. McFarland, Wm. Alvarez, General Elec. Co. 20 cents (by mail 25 cents).
- *CP. A New Liquid Rheostat. T. B. Montgomery, Allis-Chalmers Mfg. Co.
- 48-11. Improvements in Rolling Mill Preset Screw-Down Controllers. J. D. Leitch, C. A. Schurr, The Elec. Controller and Mfg. Co. 15 cents (by mail 20 cents).

2:00 p.m.—Relay Protection of Transmission Lines

Urban Room
E. L. HARDER, Presiding

The Project Committee of the Relay Committee has developed this subject through the study of a typical transmission system, having short, medium, and long lines. Quite complete Calculating Board studies have been made for this system, for faults, load swings and reclosing, so that the relaying schemes considered could be put to the test of quantitative application data. Costs also have been determined for economic comparisons where needed.

The session will be introduced by three conference papers prepared by the groups working on the short, medium, and long lines respectively. The first paper will also discuss the general philosophy of back-up protection. The second will cover the factors involved in applications on medium length lines. The third paper will dwell chiefly on the relay problems of long, heavily loaded lines, with and without high speed reclosing. Single and three-pole reclosing are considered.

Having thus introduced the factors and problems entering into relay application on transmission lines the meeting will be opened for a general conference type discussion of the subject. It is hoped later to combine the material already prepared, as developed further by discussion at the conference, into a useful report on transmission line protection.

2:00 p.m.—Transformers

Adonis Room
H. B. KEATH, Presiding

- 48-18. Influence of the Core Form upon the Iron Losses of Transformers. G. M. Stein, Westinghouse Elec. Corp. 35 cents (by mail 40 cents).
- 48-19. Electrical Insulation Deterioration Treated as a Chemical Rate Phenomenon. T. W. Dakin, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).
- 48-20. Terratex—A Thin, Flexible Inorganic Insulation. T. R. Walters, General Elec. Co. 15 cents (by mail 20 cents).

2:00 p.m.—Electronic Instruments

Cardinal Room
W. R. CLARK and J. G. REID, Jr., Presiding

- *CP. Fail-Safe Operation of Electronic Circuits. G. D. Hanchett, RCA Mfg. Co.
- 48-21. Electronic Circuits of a Supersonic Reflectoscope. R. B. DeLano, Jr., Sperry Products, Inc. 15 cents (by mail 20 cents).
- 48-96. Oil Film Thickness Indicator for Journal Bearings. M. L. Greenough, Natl. Bureau of Stds. 25 cents (by mail 30 cents).
- 48-9. D-C Amplifier Stabilized for Zero and Gain. A. J. Williams, Jr., R. E. Tarpley, W. R. Clark, Leeds and Northrup Co. 35 cents (by mail 40 cents).
- *CP. High-Voltage Cathode-Ray Oscillographs for High Speed Transients for Surge Testing. W. G. Fockler, Allen B. DuMont Labs., Inc.
- *CP. The "Linascop"—An Echo-Ranging-Type Fault Locator for High-Voltage Lines. J. R. Leslie, K. H. Kidd, The Hydro-Elec. Power Comm. of Ont.

(Also see papers in Monday morning session on Applications in the Steel Industry).

6:30 p.m.—Eta Kappa Nu Recognition Awards Dinner

Urban Room
Toastmaster: Dean N. S. HIBSHMAN
Speaker: C. A. POWEL

Awards:

- 1942 Dr. John Robinson Pierce, Calif. Inst. of Tech. '33; Bell Telephone Labs., Inc.
- 1943 Nathan I. Hall, West Virginia Univ. '34, Hughes Aircraft Co.
- 1944 Dr. R. W. Porter, Univ. of Kansas '34; General Elec. Co.
- 1945 James M. Wallace, Univ. of Pittsburgh '35; Westinghouse Elec. Corp.
- 1946 Dr. Everard Mott Williams, Yale Univ. '36; Carnegie Inst. of Tech.
- 1947 R. R. Hough, Princeton Univ. '39; Bell Telephone Labs., Inc.

In addition two or three honorable mentions will be made for each of these years. Mr. W. J. Lyman of the Duquesne Light Company is chairman of the arrangements for the dinner.

Tuesday, January 27

9:30 a.m.—Trip to Pittsburgh Plate Glass Co.

9:30 a.m.—Trip to Springdale Power Plant

9:30 a.m.—Steel

Pittsburgh Room

F. W. CRAMER and T. B. MONTGOMERY, Presiding

Talk on Irvin Works of Carnegie-Illinois Steel Company to provide introduction to inspection trip. M. W. Reed, Vice-President, Engg., Carnegie-Illinois Steel Co.

48-22. Electric Equipment for Cold Strip Reduction Mills. W. E. Miller, General Elec. Co. 20 cents (by mail 25 cents).

*CP. WK² Aspect of High-Speed Mills. T. B. Montgomery, Allis-Chalmers Mfg. Co.

*CP. Some Generalizations Regarding Time Delays and Their Importance in Regulator Systems. W. O. Osbon, Westinghouse Elec. Corp.

9:30 a.m.—Material Handling

Forum Room

E. M. HAYS, Presiding

*CP. Electric Drives with Fluid Couplings for Material Handling Equipment. F. W. Atz, Link Belt Co.

*CP. Features of New 600 Series Mill Motor for Material Handling Applications. C. B. Hathaway, Westinghouse Elec. Corp.

*CP. Selection of D-C Series Motors for Crane Applications. M. A. deFerranti, General Elec. Co.

9:30 a.m.—Switchgear I

Ball Room

H. J. LINGAL, Presiding

48-23. A Study of A-C Arc Behavior Near Current Zero by Means of Mathematical Models. T. E. Browne, Jr., Westinghouse Elec. Corp. 35 cents (by mail 40 cents).

48-24. A Compressed Air Circuit Breaker for 23-Kv Arc Furnace Duty. H. M. Wilcox, B. P. Baker, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).

48-26. Arcing Fault Currents in Low-Voltage Alternating-Current Circuits. C. F. Wagner, L. L. Fountain, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).

9:30 a.m.—Rotating Machinery

Adonis Room

C. E. KILBOURNE, Presiding

48-27. Steady-State Equivalent Circuits of Synchronous and Induction Machines. Gabriel Kron, General Elec. Co. 25 cents (by mail 30 cents).

48-28. An Induction Generator Used with the All-Electric Automatic Pilot for Planes. H. Vickers, England. 15 cents (by mail 20 cents).

48-29. The Single-Phase Synchronous Machine. I. A. Terry, General Elec. Co.; B. L. Robertson, Univ. of Calif. 25 cents (by mail 30 cents).

48-30. Performance of the Single-Phase Synchronous Machine. B. L. Robertson, T. A. Rogers, Univ. of Calif. 15 cents (by mail 20 cents).

48-31. A Study of the Three-Phase Commutator Armature with Six Adjustable Brushes. P. W. Franklin, Continental Elec. Co. 25 cents (by mail 30 cents).

9:30 a.m.—Electronics

Urban Room

C. H. WILLIS, Presiding

48-32. Quadrature Operation of Filamentary Thermionic Gas Tubes. V. L. Holdaway, Bell Tel. Labs., Inc. 15 cents (by mail 20 cents).

48-33. Method for the Measurement of the Ionization and Deionization Times of Thyatron Tubes. Milton Birnbaum, Washington, D. C. 20 cents (by mail 25 cents).

48-34. Printed Circuit Developments. Cleo Brunetti, Natl. Bureau of Stds. 35 cents (by mail 40 cents).

48-35. Performance of Pumped Ignitron Rectifiers. C. C. Herskind, E. J. Remscheid, General Elec. Co. 15 cents (by mail 20 cents).

9:30 a.m.—Symposium on Railroad Electrification

Cardinal Room

J. C. AYDELOTT, Presiding

48-97. Power Costs and the Contribution of Existing Transmission Networks towards Cost Reduction of Power for Electrification of Main Line Railroads with Moderate Traffic. Llewellyn Evans, Tennessee Valley Authority. 15 cents (by mail 20 cents).

48-37. Railroad Electrification Energy Conversion and Transmission Costs. R. L. Kimball, J. G. Holm, Gibbs and Hill, Inc. 25 cents (by mail 30 cents).

48-38. Are the Overhead Distribution Costs Retarding Railroad Electrification? L. W. Birch, Ohio Brass Co. 35 cents (by mail 40 cents).

48-54. Electric Locomotives with Identical Basic Components. W. A. Brecht, Charles Kerr, Jr., Westinghouse Elec. Corp. 15 cents (by mail 20 cents).

1:30 p.m.—Trip to Irvin Steel Works

2:00 p.m.—Machine Tools

Forum Room

W. B. WICTON, Presiding

*CP. Electrical Engineering in Machine Tool Industry. W. B. Wigton, The Cincinnati Planer Co.

*CP. New Types of Adjustable Speed Motors for Machine Tools. W. M. Elder, Westinghouse Elec. Corp.

*CP. Electric Drives for Planers. J. W. Harper, General Elec. Co.

*CP. Electrical Features and Performance Analysis of an Automatic Hob and Relief Cutter Sharpener. R. E. Johnson, Frank A. Glassow, Barber-Colman Co.

2:00 p.m.—Switchgear II

Ball Room

H. J. LINGAL, Presiding

48-40. A 230-Kv 3-Cycle Oil Circuit Breaker for Extra-Heavy Arc Rupturing Duty. W. M. Leeds, G. B. Cushing, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).

48-41. Unusual Performance of Standard 230-Kv Impulse and Tank-Type Oil Circuit Breakers on Field Tests. E. B. Rietz, General Elec. Co. 15 cents (by mail 20 cents).

48-42. Field Tests for Development of 10-Million KVA 230-Kv Oil Circuit Breakers for Grand Coulee Power Plant. C. L. Killgore, W. H. Clagett, United States Bureau of Reclamation. 35 cents (by mail 40 cents).

48-43. Performance Tests of the AEG (German) Free-Jet, Air-Blast, 220-Kv., 2500-MVA, Reclosing Circuit Breaker. Alexander Dovjikov, C. C. Diamond, Bonneville Pr. Adm. 25 cents (by mail 30 cents).

over

American Institute of Electrical Engineers

2:00 p.m.—Telemetering

Urban Room
G. S. LUNGE, Presiding

- 48-45. Modern Telemetering System—Providing Kilowatt Indication, Recording, Integration and Demand. R. G. Meyerand, Union †ACO. Elec. Co. of Missouri. 15 cents (by mail 20 cents).
- 48-46. A Faster Telemeter for Carrier Current Channels. E. E. Lynch, H. C. Thomas, G. S. Lunge, General Elec. Co. 15 cents (by mail 20 cents).
- 48-44. New Devices Derived from a Torque Balance Telemeter. W. H. Burnham, General Elec. Co. 15 cents (by mail 20 cents).

2:00 p.m.—High-Frequency Measurements

Adonis Room
F. J. GAFFNEY, Presiding

- 48-47. A Direct Reading D-C Bridge for Microwave Power Measurements. H. J. Carlin, Judd Blass, Polytechnic Inst. of Brooklyn. 20 cents (by mail 25 cents).
- 48-48. A Broadband Signal Generator. T. P. Hahn, John Ebert, W. A. Lynch, Polytechnic Research and Development Co. 15 cents (by mail 20 cents).
- 48-49. Microwave Frequency Measurements and Standards. B. F. Husten, Harold Lyons, Natl. Bureau of Stds. 25 cents (by mail 30 cents).
- 48-50. A Standard of Attenuation for Microwave Measurements. R. E. Grantham, J. J. Freeman, Natl. Bureau of Stds. 20 cents (by mail 25 cents).

2:00 p.m.—Heavy Traction

Cardinal Room
J. C. AYDELOTT, Presiding

- 48-36. Comparative Operating Results of Steam, Diesel-Electric, and Electric Motive Power on the Great Northern Railway Electrification. J. F. N. Gaynor, Great Northern R.R. 15 cents (by mail 20 cents).
- 48-39. Shunt Capacitor Installation for Single-Phase Railway Service. H. F. Brown, New York, New Haven, and Hartford RR.; R. L. Witzke, Westinghouse Elec. Corp. 25 cents (by mail 30 cents).
- 48-53. A Unique Application of the Wheatstone Bridge to High-Speed Train Braking. C. M. Hines, Westinghouse Air Brake Co. 15 cents (by mail 20 cents).
- 48-52. Responsive Devices on Diesel-Electric Locomotives. A. V. Johansson, General Elec. Co. 15 cents (by mail 20 cents).

2:00 p.m.—Some New Electronic Devices and Applications

Pittsburgh Room
W. G. DOW, Presiding

- *CP. The Measurement of Large Pulse Currents. N. Rochester, D. L. Stevens, Sylvania Elec. Prod., Inc.
- *CP. New Apparatus and Techniques for Cathode-Ray Oscillography. P. S. Christaldi, Allen B. DuMont Labs.

Winter General Meeting

- *CP. The Lead Sulphide Photoconductive Cell. R. W. Engstrom, RCA Victor Division.
- *CP. The Motion Detector—An Application of Microwaves. W. C. White, General Elec. Co.
- *CP. The Hydrogen-Diffusion Leak Locator. Herbert Nelson, RCA.

2:00 p.m.—Membership Committee Meeting

Rooms 468-470
TOMLINSON FORT, Presiding

A meeting to review and discuss membership activities, to which members of the Sections Committee, the Section Chairmen, and others have been invited.

6:30 p.m.—Dinner-Smoker

17th Floor

Dinner will start at 6:30 p.m., followed by an array of top-notch vaudeville acts. Tables seat 4 or 10 persons. Tickets \$7.50 per person. Please obtain early due to limited accommodations.

7:00 p.m.—Ladies' Dinner

Pittsburgh Room, Lower Lobby

Wednesday, January 28

10:00 a.m.—General Session

Ball Room
President BLAKE D. HULL, Presiding

Edison Medal Presentation to Dr. Joseph Slepian, Associate Director of Research, Research Laboratories, Westinghouse Elec. Corp.

Address: "Solar Radiation and Its Effect Upon Power Transmission and Radio Communication." Jack T. Wilson, Physicist, Allis-Chalmers Mfg. Co.

1:30 p.m.—Trip to Westinghouse E. Pittsburgh Works

1:30 p.m.—Trip to Dravo Shipyard

2:00 p.m.—Power Distribution in Steel Mills and Mines

Pittsburgh Room
D. L. BEEMAN and F. W. CRAMER, Presiding

- *CP. Basic Pattern for Arrangement of Electric Systems for Steel Mills. H. J. Finison, General Elec. Co.
- *CP. Short-Circuit Currents in D-C Systems. Williams Deans, I-T-E Circuit Breaker Co.
- 48-26. Arcing Fault Currents in Low-Voltage Alternating-Current Circuits. C. F. Wagner, L. L. Fountain, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).
- 48-16. Features of a New A-C Bus Design. R. N. Wagner, Aluminum †ACO. Co. of America. 15 cents (by mail 20 cents).

over

Wednesday - continued

2:00 p.m.—Transmission and Distribution

Ball Room
C. F. WAGNER, Presiding

- 48-55. 10,000-Kva Series Capacitor Improves Voltage on 66-Kv Line Supplying Large Electric Furnace Load. B. M. Jones, J. M. Arthur, C. M. Stearns, Duquesne Light Co.; A. A. Johnson, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).
- 48-56. Design and Layout of 66-Kv 10,000-Kva Series Capacitor Substation. G. B. Miller, Duquesne Light Co. 15 cents (by mail 20 cents).
- 48-57. Design and Protection of 10,000-Kva Series Capacitor for 66-Kv Transmission Line. A. A. Johnson, R. E. Marbury, Westinghouse Elec. Corp.; J. M. Arthur, Duquesne Light Co. 15 cents (by mail 20 cents).
- 48-25. Transient Shaft Torques in Turbine Generators Produced by Transmission-Line Reclosing. J. W. Batchelor, D. L. Whitehead, and J. S. Williams, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).

2:00 p.m.—Distribution Circuit Protection, Construction, Service Continuity and Fault Records

Urban Room
HAROLD COLE, Presiding

- *CP. Selecting Distribution Line Sectionalizing Devices. R. F. Quinn, General Elec. Co.
- *CP. Rural Line Sectionalizing with Repeater Fuses. R. M. Schahfer, Northern Indiana Public Service Co.
- *CP. Thirty Years Experience in Relay Protection of Distribution Feeders. C. L. Headley, Cons. Gas and Elec. Co. of Baltimore.

2:00 p.m.—Basic Sciences

Cardinal Room
J. D. TEBO, Presiding

- 48-1. A Critical Analysis of Voltage Conventions and Double-Subscript Notations. M. B. Reed, W. A. Lewis, Illinois Inst. of Tech. 20 cents (by mail 25 cents).
- 48-58. Hystero-Viscosity in Silicone. M. G. Malti, Cornell Univ.; A. K. Chatterjee, Univ. of Illinois. 20 cents (by mail 25 cents).
- 48-68. Attenuator Materials, Attenuators, and Terminations for Microwaves. G. K. Teal, M. D. Rigterink, C. J. Prosch, Bell Telephone Labs., Inc. 30 cents (by mail 35 cents).
A Demonstration of Microwave Attenuators will accompany the presentation.
- 48-69. Insulation Breakdown As a Function of Area. L. R. Hill, P. L. Schmidt, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).
- 48-70. Solutions of the Mathieu Equation. H. J. Gray, Richard Merwin, J. G. Brainerd, Univ. of Pennsylvania. 25 cents (by mail 30 cents).

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

Forum Room
H. I. ROMNES, Presiding

- 48-59. Recent Improvements in Loading Apparatus for Telephone Cables. S. G. Hale, Bell Telephone Labs., Inc.; A. L. Quinlan, Western Elec. Co.; J. E. Ranges, Bell Telephone Labs., Inc. 25 cents (by mail 30 cents).
- 48-60. A Telegraph Signal Analyzer. G. L. Erickson, The Western Union Tel. Co. 15 cents (by mail 20 cents).
- 48-8. An Electro-Acoustical Locating System. E. A. Walker, The Pennsylvania State College. 15 cents (by mail 20 cents).
- 48-99. The Director for Automatic Telephone Switching Systems. Arthur Bessey Smith, Assoc. Elec. Labs., Inc. 30 cents (by mail 35 cents).
- *CP. Rotary Switching System for Small Community Exchanges. R. W. Engsborg, Federal Tel. and Radio Corp.
- *CP. Modern Reperforator Switching System for Patron Telegraph Service. R. F. Dirkes, Western Union Teleg. Co.

2:00 p.m.—Light Traction

Adonis Room
J. C. AYDELOTT, Presiding

- 48-63. Trolley Coach Distribution System. G. R. McDonald, General Elec. Co. 30 cents (by mail 35 cents).
- 48-62. Electrically Propelled Vehicles Most Economical in City
†ACO. Transit. G. M. Woods, Westinghouse Elec. Corp. 20 cents (by mail 25 cents).
- 48-64. Three-Compartment Articulated Cars for Test on Rapid Transit Division, Chicago Transit Authority. H. A. Otis, Chicago Transit Authority. 15 cents (by mail 20 cents).
- 48-51. Alternating-Current Air Conditioning for Railroad Passenger
†ACO. Cars. H. H. Hanft, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).

7:00 p.m.—Dinner-Dance

Ball Room

Dinner will be served at 7:00 p.m. followed by dancing and a floor show. Tables for the dinner and dance will accommodate 4 or 10 persons. Tickets \$6.00 per person. Please obtain tickets early to facilitate arrangements.

Thursday, January 29

9:30 a.m.—Board of Directors Meeting

Rooms 468-470

9:30 a.m.—Trip to 66-Kv 10,000 Kva Series Capacitor Installation

9:30 a.m.—Power Distribution in the Mining and Glass Industry

Urban Room
R. T. WOODRUFF, Presiding

- *CP. Power Supply for a Glass Plant. J. E. Arberry, Pittsburgh Plate Glass Co.
- *CP. Power Supply for Strip Mining. Albert Brown, Phila. and Reading Coal and Iron Co.
- 48-65. The New D-C Sectionalization Application Standards. M. W. Pennybacker. Donald J. Baker, I-T-E Circuit Breaker Co. 15 cents (by mail 20 cents).

9:30 a.m.—Metallic Rectifiers

Forum Room
L. O. GRONDAHL, Presiding

- 48-66. Twenty-five Years of Copper Oxide Rectifiers. L. O. Grondahl, Union Switch and Signal Co. 25 cents (by mail 30 cents).

Discussions

- *CP. Mechanized Methods of Manufacture of Copper Oxide Rectifiers. E. A. Harty, General Elec. Co.
- *CP. Industrial Applications of Copper Oxide Rectifiers. I. R. Smith, Westinghouse Elec. Corp.
- *CP. Copper Oxide Rectifiers in Railway Signalling. G. W. Baughman, Union Switch & Signal Co.
- *CP. Copper Oxide Rectifiers in the Instrument Field. F. X. Lamb, Weston Elec. Inst. Co.
- *CP. Copper Oxide Varistors in Communication Circuits. N. Y. Priessman, Bell Telephone Labs.

9:30 a.m.—Arc Welding

Cardinal Room
E. F. STEINERT, Presiding

- *CP. Electric Power Supply Problems of Inert Gas Arc Welding. A. J. Welch, General Elec. Co.
- *CP. Electrical Characteristics of the Arc in Heliarc Welding. H. T. Herbst, Linde Air Products Co.
- *CP. Power Supply for Farm Welders. A. A. Mathews, G. V. Paterson, Ohio Power Co.

9:30 a.m.—Extra-High-Voltage Cable Systems

Ball Room
L. F. HICKERNELL, Presiding

- 48-71. 138,000-Volt Polyethylene Sheathed Compression Cable—Pipe-Line Type. J. E. McCormack, C. T. Hatcher, Con. Edison Co. of N. Y., Inc.; K. S. Wyatt, W. A. Del Mar, E. J. Merrell, J. H. Palmer, Phelps Dodge Copper Prod. Corp.; E. F. DeTurk, Long Island Ltg. Co. 35 cents (by mail 40 cents).
- 48-72. 115-Kv High-Pressure Oil-Filled Pipe Cable Installation at New Orleans, Louisiana. W. R. Bullard, Ebasco Service, Inc.; A. D. Pettee, General Cable Corp.; G. L. Rhodes, New Orleans Public Serv., Inc. 35 cents (by mail 40 cents).
- 48-73. Thermal Characteristics of a 120-Kv High-Pressure, Gas-Filled Cable Installation. W. D. Sanderson, J. Sticher, The Detroit Edison Co.; M. H. McGrath, General Cable Corp. 35 cents (by mail 40 cents).
- 48-3. Location of Gas Leaks in Pipe-Encased Gas-Pressure Cable Lines. J. D. Piper, The Detroit Edison Co. 30 cents (by mail 35 cents).
- 48-7. Use of Reduced-Scale Models for the Solution of Cable Temperature Problems—Part II. Andrew Gemant, Joseph Sticher, The Detroit Edison Co. 20 cents (by mail 25 cents).

9:30 a.m.—Conference on Applied Mathematics

Adonis Room
M. G. MALTI, Presiding

The general subject to be discussed at this conference is: "What the Engineer Can do with His Experimental Data." The speakers are:

- *CP. Introductory Remarks. M. G. Malti, Cornell Univ.
- *CP. Garrett Birkhoff, Harvard Univ.
- *CP. H. Poritsky, General Elec. Co.
- *CP. E. G. Olds and Forman Action, Carnegie Inst. of Tech.
- *CP. A Large Scale General Purpose Electric Analog Computer. E. L. Harder, Westinghouse Elec. Corp.; G. D. McCann, Calif. Inst. of Tech.

9:30 a.m.—Facsimile and Picture Transmission

Pittsburgh Room
J. L. CALLAHAN, Presiding

- 48-74. Western Union Teletape Facsimile. L. G. Pollard, The Western Union Tel. Co. 15 cents (by mail 20 cents).
- *CP. Use of Telephone Circuits for Picture and Facsimile Service. I. E. Lattimer, American Tel. and Tel. Co.
- *CP. Consideration on Facsimile Transmission Speed. H. F. Burkhard, Signal Corps Labs.
- *CP. Facsimile Transmission for Pickup and Delivery of Telegrams. G. H. Ridings, Western Union Teleg. Co.
- *CP. Standards for Facsimile Broadcasting. J. V. L. Hogan, Radio Inventions, Inc.

12:30 p.m.—Board of Directors Luncheon

Rooms 468-470

1:00 p.m.—Trip to Alcoa Research

1:30 p.m.—Trip to Bureau of Mines Expl. Test Station

over

2:00 p.m.—Resistance Welding

Cardinal Room
C. E. SMITH, Presiding

- *CP. What Is Resistance Welding? J. F. Deffenbaugh and F. A. Bodenheim, Jr., Federal Mach. and Welder Co.
- *CP. Resistance Welding in the Steel Mill. J. J. Riley, Taylor-Winfield Corp.
- *CP. Summary of Work and Program of the Subcommittee on Power Supply for Resistance Welding Machines, C. M. Rhoades, Chairman.

2:00 p.m.—Conference on Mechanical Rectifiers

Ball Room
H. WINOGRAD, Presiding

This conference is sponsored by the Electronic Power Converter Committee and the Electronics Committee.

A mechanical rectifier, used for converting a-c power to d-c power, consists of a set of synchronously driven contacts which are connected between a rectifier transformer and the d-c load circuit. Investigations of this type of rectifier were carried on in this country some 10 to 15 years ago. Interest in this subject has been revived by the development and commercial application in Germany during the war of high-current mechanical rectifiers for ratings up to 5,000 amperes at 400 volts d-c per set of six contacts.

- *CP. History of Mechanical Rectifiers. J. T. Thwaites, Canadian Westinghouse Co.
- *CP. The Problem of Commutation. Walther Richter, Allis-Chalmers Mfg. Co.
- *CP. Commutating Reactors. B. D. Bedford, General Elec. Co.
- *CP. The German Mechanical Rectifier. Otto Jensen, I-T-E Circuit Breaker Co.

2:00 p.m.—Fault Limiting Devices

Forum Room
H. R. STEWART, Presiding

- 47-237. Present-Day Grounding Practices on Power Systems. AIEE Subject Committee on Present-Day Grounding Practices, late R. D. Evans, Chairman. 35 cents (by mail 40 cents).
- 48-78. Survey of Lightning Protective Equipment for Rotating A-C Machines. AIEE Lightning Protective Devices Subcommittee. 15 cents (by mail 20 cents).
- 48-79. Expulsion-Type Lightning Arresters Impulse Sparkover Voltage Characteristics. AIEE Lightning Protective Devices Subcommittee. 15 cents (by mail 20 cents).

2:00 p.m.—Symposium on Electrical Network Theory

Urban Room
J. G. BRAINERD, Presiding

During the war years, although great advances were being made in the field of Electrical Network Theory, very little material was published, principally due to restrictions for military reasons. This symposium will review the results of recent developments (within the last 10 years) and discussion of new problems, in the field of linear network theory.

The speakers for this symposium are:

- *CP. R. L. Dietzold, Bell Telephone Labs.
- *CP. Gabriel Kron, General Elec. Co.
- *CP. C. F. Wagner, Westinghouse Elec. Corp.
- *CP. E. L. Harder, Westinghouse Elec. Corp.
- *CP. E. A. Guillemin, Mass. Inst. of Tech.

2:00 p.m.—Magnetic Recording

Pittsburgh Room
J. L. CALLAHAN, Presiding

- 48-75. Magnetic Recording Tapes. Marvin Camras, Armour Research Foundation. 20 cents (by mail 25 cents).
- 48-76. Turn-in-Gap Erase Head for Magnetic Recorders Providing Intense High-Frequency Fields. D. E. Wiegand, R. E. Zenner, Armour Research Foundation. 15 cents (by mail 20 cents).
- 48-77. The Practical Application of Supersonic Bias in Magnetic Recording. H. A. Howell, Indiana Steel Prod. Co. 15 cents (by mail 20 cents).
- *CP. Distortions in Magnetic Tape Recording Due to the Configuration of the Bias Field. S. J. Begun, Brush Dev. Co.
- *CP. Drive Mechanism for High Fidelity Magnetic Tape Recorders (Including Demonstration). R. H. Ranger, R. H. Kuhnappel, Rangertone, Inc.

2:00 p.m.—Conference on Safety

Adonis Room
ROBIN BEACH, Presiding

Selling the Public on Safety from Low-Voltage Electrical Hazards.

1. Motion picture: "The Shocking Truth," a technicolor film on low-voltage hazards. Courtesy of The Liberty Mutual Ins. Co.
2. Symposium on How to Enforce and Caution the Public Against the Hazards of Low-Voltage Shocks.

Friday, January 30

9:30 a.m.—General Applications to Mining

Ball Room
A. C. MUIR, Presiding

- *CP. Conversion Equipment for Mine Power. W. R. Morton, General Elec. Co.
- *CP. Motors and Controls for Underground Mining Machines. D. E. Renshaw, Westinghouse Elec. Corp.
- 48-80. Electrical Control Problems in Coal Mines. C. O. Wood, Goodman Mfg. Co. 15 cents (by mail 20 cents).

Friday - continued

9:30 a.m.—Electrothermal Processes

Urban Room
F. R. BENEDICT, Presiding

- *CP. Electrode Control and Associated Operating Mechanisms. E. A. Hanff, Swindell-Dressler Corp.
- *CP. Experience in Design and Control of Ferro-Alloy Furnaces. F. V. Andreas, Southern Ferro Alloys Co.
- *CP. Electrode Control for Arc Furnaces. C. E. Valentine, E. H. Browning, Jr., Westinghouse Elec. Corp.
- *CP. Electrical Equipment and Operation of Graphitizing Furnaces. F. M. Baxandall, E. R. Cole, Dow Chemical Co.
- *CP. Electrode Control for Arc Furnaces. A. R. Oltrogge, General Elec. Co.

9:30 a.m.—Excitation and Speed Governing

Pittsburgh Room
A. H. FRAMPTON, Presiding

- 48-2. Generator Stability at Low Excitation. E. L. Michelson, L. G. Lischer, Commonwealth Edison Co. 25 cents (by mail 30 cents).
- 48-81. Underexcited Operation of Turbine-Generators. C. G. Adams, J. B. McClure, General Elec. Co. 15 cents (by mail 20 cents).
- 48-82. Rototrol Excitation Systems. J. E. Barkle, C. E. Valentine, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).
- 48-83. Main Exciter Rototrol Excitation for Turbine Generators. C. Lynn, C. E. Valentine, Westinghouse Elec. Corp. 15 cents (by mail 20 cents).
- 48-90. Precise Turbine Governor. H. E. Warren, Lombard Governor Corp. 15 cents (by mail 20 cents).
- 48-89. Hydraulic Turbine Governor Specification. E. B. Strowger, Buffalo Niagara Elec. Corp.; C. L. Avery, Woodward Governor Co. 15 cents (by mail 20 cents).
- 48-4. Recommended Specification for Speed-Governing of Steam Turbines Intended to Drive Electric Generators Rated 500 Kw and Up. Joint AIEE-ASME Committee on a Recommended Specification for Prime Mover Speed Governing; M. J. Steinberg, Chairman. *Presentation by title.* 30 cents (by mail 35 cents).
- 48-5. Recommended Specification for Speed-Governing of Hydraulic Turbines Intended to Drive Electric Generators. Joint AIEE-ASME Committee on a Recommended Specification for Prime Mover Speed Governing; M. J. Steinberg, Chairman. *Presentation by title.* 30 cents (by mail 35 cents).

9:30 a.m.—Conference on Substations

Adonis Room
G. S. WHITLOW, Presiding

This conference will have two or three papers on each of the following subjects:

- *CP. 1. Protection of Pilot Wire Used for Telemetry and Supervisory Control.
- *CP. Problems Relating to A-C and Low Voltage D-C.

9:30 a.m.—Servomechanisms and Measurements

Forum Room
E. I. GREEN and J. B. RUSSELL, Presiding

- 48-84. The Effect of Coulomb Friction on the Performance of Servomechanisms. G. D. McCann, F. C. Lindvall, C. H. Wilts, Calif. Inst. of Tech. 25 cents (by mail 30 cents).
- 48-85. Graphical Analysis of Control Systems. W. R. Evans, Washington Univ. 30 cents (by mail 35 cents).
- 48-94. Relation between Electrical and Mechanical Parameters of a Permanent Magnet Movable Coil Instrument Having a General Circuit. W. N. Goodwin, Jr., Weston Elec. Instr. Corp. 25 cents (by mail 30 cents).
- 48-67. A Bridge Method for Determining the Motional Characteristics of Permanent Magnet-Movable Coil Instrument Mechanisms. R. W. Gilbert, Weston Elec. Instr. Corp. 15 cents (by mail 20 cents).

9:30 a.m.—Synthetic Crystals

Cardinal Room
The late R. G. McCURDY, Sponsor

- 48-86. Crystal Filters Using Ethylene Diamine Tartrate in Place of Quartz. E. S. Willis, Bell Telephone Labs., Inc. 15 cents (by mail 20 cents).
- 48-87. Design and Performance of Ethylene Diamine Tartrate Crystal Units. J. P. Griffin, E. S. Pennell, Bell Telephone Labs., Inc. 15 cents (by mail 20 cents).
- 48-88. Growing Crystals of Ethylene Diamine Tartrate. A. C. Walker, G. T. Kohman, Bell Telephone Labs., Inc. 15 cents (by mail 20 cents).

1:30 p.m.—Trip to Tidd 500 Kv Test Lines

2:00 p.m.—Electric Cables in Mines

Ball Room
Vice-President E. W. DAVIS, Presiding

- *CP. Discussion of Electric Cable Practice in Coal Mines of Illinois. C. C. Conway, Consolidated Coal Co.
- *CP. Mechanical Problems of Trailing Cables on Mobile Mine Machinery. C. B. Peck, Anaconda Wire and Cable Co.
- *CP. Safe Use and Installation of Electric Cables in Coal Mines. T. R. Weichel, Bureau of Mines.
- *CP. A Machinery Manufacturer Looks at Cable. Frank Hugus, Joy Mfg. Co.
- *CP. Improvements in Mining Machine Cables. R. A. Schatzel, Rome Cable Co.
- *CP. Essential Characteristics of Design and Materials for Mine Trailing Cables. G. J. Crowdes, Simplex Wire & Cable Co.

2:00 p.m.—General System Engineering

Urban Room
J. E. McCORMACK, Presiding

- *CP. Electric Power and Our National Defense. W. L. Cisler, The Detroit Edison Co.

over

Friday - continued

Symposium on Controllable Factors Affecting System Load

- *CP. Results of Frequency and Voltage Reduction Tests on an Isolated System. C. B. Kelly, United Light and Railways Serv. Co.
- *CP. Operating Tests of Voltage-Load Reductions. D. P. Reed, New England Pr. Co.
- *CP. Voltage and Frequency Reduction as Tools for Handling Emergency Capacity Conditions. H. W. Phillips, Pennsylvania-New Jersey Interconn.
- *CP. Technical Approach As to the Effect of Voltage and Frequency Reductions on System Load. J. E. McCormack, Cons. Edison Co. of N. Y., Inc.

2:00 p.m.—Industrial Control

Forum Room
J. D. LEITCH, Presiding

- *CP. Steel Mill Control Practices and Trends. A. W. Schmitz, General Elec. Co.
- *CP. Two Overload Relays versus Three on 3-phase Systems. K. Pinder, E. I. DuPont de Namours, Inc.
- *CP. Heavy Duty D-C Contactors, 6000 A, 3000 A, and 1500 A. R. M. Peeples, C. R. Peter, Allis-Chalmers Mfg. Co.
- *CP. High Voltage, High Interrupting Capacity Controllers with Current Limiting Power Fuses. E. H. Alexander, General Elec. Co.

2:00 p.m.—Radio Relay Systems

Cardinal Room
E. G. PORTS, Presiding

- *CP. The Philco Philadelphia-New York Microwave Television Relay System. W. H. Forester, Philco Corp.
- *CP. Portable Television Studio to Transmitter Link. C. A. Rosencrans, RCA.
- 48-91. A 150-Kilocycle Carrier System for Radio Relay Applications. J. E. Boughtwood, Western Union Teleg. Co. 20 cents (by mail 25 cents).
- 48-92. Filters for a 150-Kilocycle Carrier System. R. C. Taylor, The Western Union Teleg. Co. 20 cents (by mail 25 cents).
- *CP. Multi-channel Carrier Telephone Equipment for Radio Link Operation. H. R. Hunkins, Federal Tel. and Radio Corp.; E. M. Ostlund, Federal Telecomm. Labs.

2:00 p.m.—Symposium on Electric House Heating with Special Emphasis on the Heat Pump

Adonis Room
M. M. BRANDON, Presiding

- 48-93. The Heat Pump from the Utility's Point of View. S. W. Andrews, American Gas and Elec. Serv. Corp. 15 cents (by mail 20 cents).

- *CP. The Heat Pump—Its Significance as a Potential Residential Electric Load. Constantine Bary, Phila. Elec. Co.
- *CP. Engine-Driven Heat Pumps. K. W. Miller, N. C. Penfold, Armour Research Foundation.
- *CP. Climatic and Usage Factors Affecting Heat Pump Selection. D. W. McLenehan, G. W. Brown, General Elec. Co.
- 48-95. Electric House-Heating Tests in Oregon. W. L. Sharp, A. E. †ACO. Opdenweyer, Portland General Elec. Co. 25 cents (by mail 30 cents).

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

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

MEETING FEATURES

GENERAL SESSION: On this occasion the Edison Medal will be presented to Dr. Joseph Slepian, Associate Director of Research, Research Laboratories, Westinghouse Electric Corporation. The medal was awarded, "For his theoretical and practical contributions to power systems through circuit analysis, arc control, and current interruption."

An illustrated feature talk on the subject of "Solar Radiation and Its Effect Upon Power Transmission and Radio Communication" will be given by Jack T. Wilson, Physicist, Allis-Chalmers Manufacturing Company.

THE DINNER-DANCE: This year marks the revival of the formal Dinner-Dance which will be held in the ballroom of the William Penn Hotel, Wednesday evening, January 28th. Dinner will start at 7:00 p.m. followed by dancing and a floor show. Tables for the Dinner and Dance will accommodate 4 or 10 persons. Tickets \$6.00 per person.

LADIES' ENTERTAINMENT: A varied and interesting program has been prepared for the ladies: a luncheon, teas, dinners, tours of the city including the Block House and inclined railway, trips to H. J. Heinz and the "Buhl Planetarium and Institute of Popular Science," and an afternoon at the University of Pittsburgh's Cathedral of Learning to see the unique Nationality Rooms, Heinz Chapel, and the Stephen Foster Memorial.

INSPECTION TRIPS to the following industries have been arranged. Registration fee 50¢ per person per trip except for the Tidd trip which will be \$2.00 per person per trip.

1. Copperweld Steel Company—Glassport, Pa.

The manufacture of copperweld steel products will be shown and the facilities for producing and controlling the products demonstrated.
Monday, 26th—1:30 p.m.

2. Irvin Works—Carnegie Illinois Steel Corp.

This is the largest steel plate rolling plant in the world. The equipment and its operation will be inspected.
Tuesday, 27th—1:30 p.m.

3. Pittsburgh Plate Glass Company—Creighton, Pa.

This company is the largest manufacturer of plate glass in the world. The operation of this plant will show how some of these products are made.
Tuesday, 27th—9:30 a.m.

INSPECTION TRIPS—Continued

4. Springdale Power Plant—West Penn Power Co.

This plant has seven large generators the most recent one being an 81,250 Kva, 3600 RPM unit. There is also an ignitron rectifier exciter. *Tuesday, 27th—9:30 a.m.*

5. Dravo Corporation—Neville Island

Construction on towboats and large freight barges will be on view and the mass-production arrangements for building these craft will be evident. *Wednesday, 28th—1:30 p.m.*

6. Westinghouse Electric Corp.—East Pittsburgh Works

This trip will cover the manufacture aisles on large generators, circuit breakers and allied equipment. In addition a demonstration of large circuit breaker operation will be given in the high power testing laboratory. *Wednesday, 28th—1:30 p.m.*

7. 10,000 Kva Series Capacitor in 66 Kv Circuit—Duquesne Light Co.

This largest and highest voltage series capacitor will be shown in operation carrying a circuit load of approximately 50,000 Kva. Certain protective devices will be in view. *Thursday, 29th—9:30 a.m.*

8. Aluminum Company of America Research Laboratories—New Kensington, Pa.

Will visit the various divisions of this modern research laboratory which include Metallography, Paints, Mechanical Testing, and Analytical laboratories. *Thursday, 29th—1:00 p.m.*

9. Bureau of Mines Explosives Testing Stations—Bruceton, Pa.

A mine explosion will be demonstrated and an opportunity will be given for visitors to inspect the test mine. *Thursday, 29th—1:30 p.m.*

10. Tidd 500 kv Test Lines and Power Station—Brilliant, Ohio

The test equipment including lines, towers, transformers, lightning arresters, and testing devices will be on view as well as the newest power plant of the American Gas and Electric Company's system. *Monday, 26th and Friday, 30th—1:30 p.m.*

The following trips may be taken daily except No. 11 for which members should register.

11. University of Pittsburgh Cyclotron

A trip to see the operation of this equipment will be scheduled for several different days. The equipment and its practical uses will be explained. *Tuesday, 27th; Wednesday, 28th; and Thursday, 29th—2:30 p.m.*

12. Heinz 57 Varieties Factory

Visitors may inspect this plant at certain times on any of the days of the week of January 26. Processing, preparation, preserving, packing, etc., of various food products will be observed.

13. Buhl Planetarium

The Planetarium may be visited any evening. Displays of electrical devices will be on evidence.

14. Inclined Railway

Opportunities will be given for visitors to ride on one of the inclined railways—probably the one which goes up Mt. Washington so that a view of downtown Pittsburgh can be seen.

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L. F. Hickernell

Reginald L. Jones

H. B. Keath

L. F. Kennedy

C. E. Kilbourne

A. J. Krupy

J. D. Leitch

H. J. Lingal

J. E. McCormack

J. D. Miner

J. R. North

J. J. Orr

W. H. Reed

Harris Reinhardt

T. R. Rhea

G. W. Scott, Jr.

Herbert Speight

M. J. Steinberg

C. G. Suits

S. D. Summers

T. O. Sweatt

J. G. Tarboux

J. D. Tebo

Frank Thornton, Jr.

L. A. Umansky

E. H. Vedder

C. F. Wagner

C. C. Whipple

G. S. Whitlow

C. H. Willis

H. Wingrad

COMMITTEE MEETINGS

Sunday, January 25

10:30 a.m. Technical Activities Subcommittee Parlor B

Monday, January 26

9:30 a.m. Towers, Poles and Conductors Subcomm. Parlor D
10:00 a.m. Lamme Medal Committee Parlor B
10:00 a.m. NEMA Codes & Standards Com. Club Floor—Parlor 4
10:00 a.m. Power Sys. Fault Limitation Working Gr. Parlor F
12:30 p.m. Finance Committee Luncheon Parlor E
1:30 p.m. Principles of Altitude Rating Subcomm. Parlor C
2:00 p.m. Communication and Science Coord. Comm. Parlor B
2:00 p.m. Joint Subcommittee on Nucleonic Instr. Parlor F
2:00 p.m. Switchgear Committee Rooms 468-470
4:00 p.m. Planning and Coordination Committee Parlor E
4:00 p.m. Relay Committee Parlor D
6:30 p.m. Planning and Coordination Dinner Rooms 468-470
8:00 p.m. Electronics Committee Parlor F

Tuesday, January 27

6:30 a.m. Industry Coordinating Committee Breakfast... Parlor B
8:00 a.m. Capacitor Subcommittee Breakfast Parlor C
9:00 a.m. Aircraft Rotating Elec. Mach. Subcomm., Room
815, Union Bank Bldg., 306 Fourth Avenue
9:30 a.m. Distr. Cir., Prot. & Constr. Subcomm. Parlor C
9:30 a.m. Resistance Htg. and Elec. Furnaces Subcomm. Parlor E
9:30 a.m. Transformer Committee Club Floor—Parlor 4
10:00 a.m. Nominating Committee Parlor B
10:00 a.m. Basic Sciences Committee Rooms 468-470
12:30 p.m. Insulated Cond. Adm. Subcomm. Luncheon... Parlor F
2:00 p.m. Membership Comm. (Sections Comm. invited) 468-470
2:00 p.m. Electric Heating Committee Parlor C
2:00 p.m. Rotating Machinery Committee Parlor E
2:00 p.m. Communication Committee Club Floor—Parlor 4
2:00 p.m. Relaying Perf. of Current Transf. Working Gr. Parlor B
2:00 p.m. Lightning & Insulator Subcommittee Parlor D
3:00 p.m. Distribution Subcommittee Parlor F

Wednesday, January 28

8:00 a.m. General Industry Appl. Comm. Breakfast. Rooms 468-470
8:00 a.m. Mining and Metal Industry Committee Parlor D
8:30 a.m. Electronic Conv. Plan. & Policy Subcomm. Parlor B
9:00 a.m. Synchronous Machinery Subcommittee Parlor F
9:00 a.m. AIEE-ASME Turbine Standards Jt. Subcomm. Parlor C
11:00 a.m. Land Transp. Comm. Club Floor—Parlor 4
Luncheon—Parlor F
12:30 p.m. Edison Medal Luncheon Parlor D
2:00 p.m. Electronic Converter Circuits Subcomm. Parlor B
2:00 p.m. Excitation Subcommittee Parlor C
2:00 p.m. Electronic Instr. Joint Subcomm. Club Floor—Parlor 4
2:00 p.m. Nucleonics Committee Parlor E
2:00 p.m. Sections Comm. (Membership Comm. invited)
Rooms 468-470
4:00 p.m. Carrier Current Committee Parlor F
4:30 p.m. Energy Sources Subcommittee Parlor D
4:30 p.m. Impulse Voltage Measurement Subcomm. Parlor B

Thursday, January 29

9:00 a.m. Ltg. Protective Dev. Subcomm., Duquesne Lt.
Offices, Room 703, 435 6th Ave.
9:00 a.m. Chemical, Electrochem, & Electroth. Comm. Parlor D
9:30 a.m. Power Generation Committee Club Floor—Parlor 4
9:30 a.m. System Engineering Committee Parlor C
9:30 a.m. Substation Committee Parlor E
9:30 a.m. Electronic Converter Appl. Subcomm. Parlor F
9:30 a.m. Board of Directors Mtg. and Luncheon ... Rooms 468-470
2:00 p.m. Power Coordinating Committee Parlor B
2:00 p.m. Industrial Power Systems Committee Parlor C
3:00 p.m. Industrial Control Committee Parlor D
4:00 p.m. Protective Devices Meeting and Dinner... Parlors E & F
8:00 p.m. Registration of Engineers' Committee Parlor B
8:00 p.m. Technical Program Committee Rooms 468-470

Friday, January 30

9:30 a.m. Domestic and Commercial Appl. Comm. Parlor B
9:30 a.m. Electric Welding Committee Parlor C
9:30 a.m. Education Committee Parlor E
9:30 a.m. Metallic Rectifier Subcommittee Parlor F
9:30 a.m. Student Branches Committee Rooms 468-470
9:30 a.m. Insulation Resistance Subcommittee Parlor D