

AMERICAN INSTITUTE *of*
ELECTRICAL ENGINEERS

Annual Convention



Saratoga Springs, N.Y.
June 22-26
1925

Headquarters :
UNITED STATES HOTEL

Condensed Program

MONDAY

- 10.00 a.m. Sections Meeting
2.00 p.m. Sections Meeting
Evening Informal Cards and Dancing

TUESDAY

- 9.30 a.m. Presidential Address
Presentation of Prizes
Session No. 1
10.30 a.m. Ladies' Putting Contest
1.30 p.m. Golf Tournament
2.00 p.m. Tennis Tournament
Trip to Adirondack Power
Plants
4.30 p.m. Piano Recital
8.30 p.m. Reception and Dance

WEDNESDAY

- 9.30 a.m. Session No. 2
12.30 p.m. Trip to General Electric Works
6.45 p.m. Past Presidents' and Directors'
Dinner
8.30 p.m. Hydroelectric Addresses

THURSDAY

- 9.30 a.m. Sessions Nos. 3 and 4
1.30 p.m. Golf Tournaments
2.00 p.m. Tennis Tournament
Lake George Trip
8.00 p.m. Directors' Meeting
8.30 p.m. Educational Address

FRIDAY

- 9.30 a.m. Session No. 5
1.30 p.m. Golf Contest
2.00 p.m. Tennis Tournament

The
Annual Convention
of the
**AMERICAN INSTITUTE OF
ELECTRICAL ENGINEERS**

June 22-26, 1925

REGISTRATION

Upon arrival all members and guests are requested to register promptly at the Convention headquarters where they will receive badges and may obtain information on all events of the Convention.

Registration for the tennis tournament closes at 1:00 p.m. Tuesday at the hotel.

Registration for the golf tournament should be made as soon as possible, but may be made at the MacGregor links until 3:00 p.m. Tuesday.

Registration for trips should be made as soon as possible.

Program

(NOTE:—Daylight-saving time is indicated throughout this program.)

Monday

10:00 a.m.—Section Delegates Conference
(Liberty Room)

2:00 p.m.—Section Delegates Conference
(Continued)

Evening—Informal Cards, Music and
Dancing

Tuesday

9:30 a.m.—Presidential Address
(Ball Room)

Dr. FARLEY OSGOOD
President, American Institute of Electrical
Engineers

Presentation of Institute Prizes

(See page 9)

Convention Program

TUESDAY, 9.30 a.m. (*continued*)

Technical Session No. 1

(Ball Room)

Present State of Transmission and Distribution Developments
by Committee on Power Transmission and Distribution
P. H. THOMAS, *Chairman*

Live Problems in Connection with Protection of Electrical Systems

by Committee on Protective Devices
H. R. WOODROW, *Chairman*

Latest Design and Practise in Power Plants
by Committee on Power Generation
VERN E. ALDEN, *Chairman*

Developments in Electrical Machine Design
by Committee on Electrical Machinery
H. M. HOBART, *Chairman*

Precision Watthour Meters and High-Frequency Measurement
by Committee on Instruments and Measurements
A. E. KNOWLTON, *Chairman*

The Activities in Research
by Committee on Research
JOHN B. WHITEHEAD, *Chairman*

10:30 a.m.—Ladies' Putting Contest and Luncheon at the MacGregor Golf Links

(Cars leave hotel at 10:30 a.m.)

1:30 p.m.—Golf Tournaments at the MacGregor Links

(See page 10)

Mershon-Cup 18-hole handicap medal play (first half), and four-ball best-ball handicap medal play.

2:00 p.m.—Tennis Tournament at Saratoga Country Club Courts

(See page 10)

Trips to Adirondack Power & Light Company Plants

Amsterdam steam station; Sprite Creek remote-control hydroelectric station, and Rotterdam high-tension substation

4:30 p.m.—Piano Recital by Professor Vladimir Karapetoff.

8:30 p.m.—President's Reception and Informal Dance

Convention Program

Wednesday

9:30 a.m.—Technical Session No. 2

(Ball Room)

Developments in Applying Electricity to Industrial Uses
by Committee on General Power Applications
A. E. WALLER, *Chairman*

Electricity's Progress in the Iron and Steel Industry
by Committee on Applications to Iron and Steel Production
F. B. CROSBY, *Chairman*

Advances in Use of Electricity in Mines
by Committee on Applications to Mining Work
F. L. STONE, *Chairman*

Rules and Personnel Problems of the Marine Field
by Committee on Applications to Marine Work
L. C. BROOKS, *Chairman*

Progress in Diverse Lines of Electrochemistry and Electrometallurgy
by Committee on Electrochemistry and Electrometallurgy
GEORGE W. VINAL, *Chairman*

A Year's Progress in Lighting
by Committee on Production and Application of Light
G. H. STICKNEY, *Chairman*

Recent Advances in the Communication Art
by Committee on Communication
O. B. BLACKWELL, *Chairman*

Revised Standards and the Organization of Standards Activities
by Standards Committee
H. S. OSBORNE, *Chairman*

12:30 p.m.—Trip to General Electric Company

(See page 9)

Luncheon will be served at the plant

6:45 p.m.—Past-Presidents' and Directors' Dinner

8:30 p.m.—Addresses on Hydroelectric Developments

(Ball Room)

Power Possibilities at Muscle Shoals
SAMUEL S. WYER, *Consulting Engineer*

The 540,000-hp. Hydroelectric Development at Isle Maligne, Quebec

WILLIAM S. LEE, *Vice-President and Chief Engineer*
Southern Power Company

Convention Program

Thursday

9:30 a.m.—Technical Session No. 3

(Liberty Room)

Engineering and Economic Elements of Two-Phase Five-wire Distribution

P. H. CHASE
Philadelphia Electric Co.

An analysis of the merits of the two-phase five-wire secondary distribution system as compared with other systems. Among the customer requirements considered are continuity of service, safety, standard voltages, voltage regulation and balance, and utilization equipment and wiring. Among the distribution-system requirements are simplicity, standardization, load and voltage balance, adaptability to physical conditions and to growth, investment, losses, costs, and the combination of lighting and power secondaries.

The Oil-Circuit-Breaker Situation from an Operator's Viewpoint

E. C. STONE
Duquesne Light Co.

This paper is an assembly of the present knowledge on (1) factors affecting interrupting capacity, (2) features of design considered essential, (3) factors affecting interrupting duty, (4) relations between ratings and cost, (5) present status of interrupting ratings and (6) applications and maintenance.

The Quadrant Electrometer

W. B. KOUWENHOVEN
Johns Hopkins University

This paper discusses the theory of the quadrant electrometer in respect to power measurements and reduces the general equation to a simple form. It shows how the constants may be determined with continuous current and that these constants apply also in a-c. power measurements.

A New Method and Means for Measuring Dielectric Absorption

R. E. MARBURY
Westinghouse Electric & Mfg. Co.

An instrument called a "dielectric lag meter" for measuring dielectric absorption has been developed. This paper tells of this instrument and its use in making measurements, particularly in three types of tests, namely: (1) residual voltage against time, (2) residual voltage against applied voltage and (3) discharge curves with condenser and resistance.

9:30 a.m.—Technical Session No. 4

(Ball Room)

Separate Leakage Reactance of Transformer Windings

O. G. C. DAHL
Massachusetts Institute of Technology

This paper discusses an experimental method of determining as a separate reactance the leakage reactance of transformer windings. The results obtained are consistent and accurate enough for engineering purposes.

Transformer Harmonics and Their Distribution

O. G. C. DAHL
Massachusetts Institute of Technology

This paper discusses the distribution of harmonics in single-phase transformers. Formulas for distribution of harmonic currents between primary and secondary circuits are given. Laboratory and field test results check well with calculated values.

A New Two-Phase to Six-Phase Transformer Connection

A. BOYAJIAN
General Electric Co.

A new transformer connection for which is claimed 100 per cent apparatus efficiency for transformation from two-phase to six-phase is described in this paper. Its merits are compared with those of the Scott and the Woodbridge connections.

Convention Program

Technical Session No. 4 (continued)

Resolution of Transformer Reactances into Primary and Secondary Reactances

A. BOYAJIAN
General Electric Co.

In this paper the stand is taken that the resolution of the leakage reactance of two windings into two separate reactances, one for each winding, is indeterminate unless referred to a third winding and that it varies according to the object in view. Formulas are given for some possible resolutions and experimental methods are described.

Losses in Iron Under the Action of Superposed A.-C. and D.-C. Excitations

O. E. CHARLTON
Alabama Power Co.
J. E. JACKSON
General Electric Co.

This study is particularly related to d.-c. excited reactors and the results indicate that the iron losses are not excessive. In fact, with high a.-c. saturation they may decrease. The copper losses resulting from double-frequency circulating current may be considerable if the conductor is not sufficiently large.

1:30 p.m.—Golf Tournaments

Mershon Cup (second half) and "Knickers" Handicap

2:00 p.m.—Tennis Tournament

Lake George Excursion Trip

Special train leaves D. & H. Station, Saratoga, promptly at 2:00 p.m., d.s.t.

8:00 p.m.—Directors' Meeting

8:30 p.m.—Educational Address Engineering-Education Systems of Europe

W. E. WICKENDEN
Director of Investigations, Society for the
Promotion of Engineering Education

Friday

9:30 a.m.—Technical Session No. 5

(Ball Room)

Study of Time Lag of the Needle Gap

K. B. McEACHRON
E. J. WADE
Both of General Electric Co.

Transients lasting only one-millionth of a second may be photographed by the adaptation of the Dufour oscillograph which is described in this paper. In this adaptation the photographic film is placed inside the exhausted tube. The paper gives an account of studies made with the instrument on the time lag of needle gaps.

Oscillograph Solution of Electro-Mechanical Systems

C. A. NICKLE
General Electric Co.

This paper describes a simple method for the easy solution of complicated dynamic problems such as those of electrical power systems or of mechanical systems. The problem is set up on an "equivalent electrical circuit" and the solution is made by means of an oscillograph. The application of the method to several cases is illustrated.

Convention Program

Technical Session No. 5 (*continued*)

The Klydonograph and Its Application to Surge Investigations

J. H. COX
J. W. LEGG

Both of Westinghouse Electric & Mfg. Co.

Four field investigations of surges on transmission lines made by the use of the klydonograph are discussed in this paper. There is also information on the latest developments in this instrument which utilizes Lichtenberg figures on a photographic emulsion for obtaining records of surges.

Overvoltages on Transmission Systems Due to Drooping of Load

E. J. BURNHAM
General Electric Co.

This paper shows the manner in which voltage rises when load suddenly goes off a waterwheel-driven generator or a hydroelectric station. Tests and calculations prove that the voltage rises more rapidly and to a greater extent than has generally been realized.

The Loaded Submarine Telegraph Cable

O. E. BUCKLEY
Bell Telephone Laboratories, Inc.

A speed of over 1900 letters per minute, or four times the traffic capacity of an ordinary submarine telegraph cable has been obtained on the new permalloy-loaded cable from New York to the Azores. This paper treats of the design and tests of the new type of cable, particularly with reference to long-distance submarine application.

1:30 p.m.—Selected-Score Golf Contest

2:00 p.m.—Tennis Tournament

Annual Convention Committee

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C. S. VAN DYKE	Excursions

Special Features

The President's Address

On Tuesday morning Dr. Farley Osgood will deliver the presidential address in the Ball Room of the hotel.

Section Delegates' Meeting

The section delegates will meet Monday morning and afternoon, under the auspices of the Sections Committee, to discuss the problems and activities of the sections. All Institute members are invited to attend this meeting.

Hydroelectric Addresses

On Wednesday evening two interesting addresses on hydroelectric power developments will be given. Samuel S. Wyer will present *Power Possibilities at Muscle Shoals*. Following this William S. Lee will describe the 540,000-h.p. *Hydroelectric Development on the Saguenay River at Isle Maligne, Quebec*.

Engineering Education

A lecture on European systems of engineering education will be given on Thursday evening by Dr. W. E. Wickenden, Director of Investigations of the Society for the Promotion of Engineering Education.

Prizes for Papers

The Institute prizes for papers will be presented to the winners on Tuesday morning. Two prizes of \$100 each will be presented. The "Transmission Prize" will be presented to R. D. Evans and R. C. Bergvall, authors of the paper entitled *Experimental Analysis of Stability and Power Limitations*. The "First Paper Prize" will be presented to Murray F. Gardner for his paper *Corona Investigation on an Artificial Line*.

Inspection Trips

On Tuesday afternoon visits will be made to three plants of the Adirondack Power & Light Company that are of special interest, namely, the Amsterdam steam station, the Sprite Creek remote-control hydroelectric station and the Rotterdam high-tension substation.

After the Wednesday morning technical session the General Electric Company will entertain both ladies and men with a trip to Schenectady. A special train will leave the D. & H. Station, Saratoga, at 12:30 p.m., sharp, daylight-saving time. Luncheon will be served at the General Electric Plant, followed by fac-

Special Features

tory inspection trips for the men. A musicale and tea will be arranged for the ladies at the Mohawk Golf Club. Returning to Saratoga a special train will leave the General Electric Works at 5:15 p.m., daylight-saving time.

Golf and Tennis

The golf tournament for the Mershon Cup will start at the MacGregor Links beginning Tuesday afternoon at 1:30 p.m. Registration will close at 3:00 p.m. Tuesday at the links.

A ladies' putting contest will be held on Tuesday morning at the MacGregor links. Lunch will be served afterwards at the club. Cars will leave the hotel at 10:30 a.m.

The Mershon Cup tennis tournament will be held on the famous grass courts of the Saratoga Country Club at 2:00 p.m. Tuesday. Registration will close at 1:00 p.m. Tuesday, at the hotel.

Facilities for informal golf and tennis will be available at all times during the Convention.

Sightseeing Trips

On Thursday afternoon a convention trip by special train will be made to Lake George. The train will leave the D. & H. Station at 2:00 p.m.

Other sightseeing trips which will be of special interest may also be made to Saratoga and Schuylerville battle fields and to Saratoga Lake.

Prof. Karapetoff's Recital

On Tuesday, at 4:30 p.m., Prof. Vladimir Karapetoff, prominent Institute member, will give a piano recital with interesting interpretations such as have been enjoyed at other conventions.

Rules for Presenting and Discussing Papers

At the technical sessions papers will be presented in abstract, ten minutes being allowed for each paper.

If a member wishes to discuss a paper he should give his name to the registration bureau or to the presiding officer of the session at which the paper is to be presented. Any member, however, is perfectly free to discuss any paper when the meeting is thrown open for discussion, even though his name is not entered beforehand.

Discussors should step to the front of the room and announce their names and professional affiliations clearly so that all may hear.

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“The advancement of the theory and practice of electrical engineering and of the allied arts and sciences, the maintenance of a high professional standing among its members, and the development of the individual engineer.”

These are the objects of the
American Institute of
Electrical Engineers



AMERICAN INSTITUTE OF
ELECTRICAL ENGINEERS

Headquarters

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