

# Midwinter Convention

of

## American Institute OF Electrical Engineers

"It is the function of the American Institute of Electrical Engineers to bring individual workers into a common unity, to join them in a community of interest."

1884



1924



CITY HALL AND WILLIAM PENN STATUE  
*Courtesy of Corn Exchange National Bank*

PHILADELPHIA, PA.

February, 4-8, 1924

BELLEVUE-STRATFORD HOTEL

American Institute of Electrical Engineers

Headquarters

33 West 39th Street, New York, N. Y.

# PROGRAM

## 40th Anniversary and 12th Midwinter Convention

### February 4-8, 1924

#### Historical

*The American Institute of Electrical Engineers was organized in 1884. A preliminary meeting was held on April 15th, followed by a second meeting on May 13th at which the first officers were elected. The objects of the Institute are "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."*

#### Monday, February 4

MORNING—9:30 A. M.—Red Room

Registration and committee meetings

All delegates and guests upon arrival are requested to register promptly at the special booth provided at Convention headquarters, where they will be provided with badges and with the latest pertinent information regarding the Convention. Registration every day—no charge.

All Committees will be represented at the Registration Bureau, so that members may obtain detailed information at all times.

AFTERNOON—2:00 P. M.—Ball Room

#### TECHNICAL SESSION

*Presiding: F. G. Baum*

*Economics and Limitations of the Super Transmission System*, by Percy H. Thomas, Consulting Engineer, New York, N. Y.

*Some Theoretical Considerations of Power Transmission*, by C. L. Fortescue and C. F. Wagner, both of the Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Power Transmission*, by F. C. Hanker, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Power Limitations of Transmission Systems*, by R. D. Evans and H. K. Sels, both of the Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Experimental Analysis of the Stability and Power Limitations of Transmission Systems*, by R. D. Evans, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa., and R. C. Bergvall.

*Limitations of Output of a Power System Involving Long Transmission Lines*, by E. B. Shand, Design Engineer, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

EVENING—8:15 P. M.—Ball Room

*Presiding: President Ryan*

*Celebration of the 40th Anniversary of the Institute.* Speakers: Elmer A. Sperry, T. Commerford Martin, Elihu Thomson and John J. Carty.



INDEPENDENCE HALL  
*The home of the Liberty Bell*

Presentation of Edison Medal to John W. Lieb, Vice-President, New York Edison Co. Address by Samuel Insull. Presentation by President Harris J. Ryan. Response by Mr. Lieb.

### Tuesday, February 5

MORNING—9:30 A. M.—North Garden

#### TECHNICAL SESSION

Presiding: F. W. Peek

*Gaseous Ionization in Built-Up Insulation-II*, by J. B. Whitehead, Dean, School of Engineering, Johns Hopkins University, Baltimore, Md.

*Overdamped Condenser Oscillations*, by Charles P. Steinmetz,\* Chief Consulting Engineer, General Electric Co., Schenectady, N. Y.

*Free Convection of Heat in Gases and Liquids-II*, by C. W. Rice, General Electric Company, Schenectady, N. Y.

*The Magnetic Properties of the Ternary Alloys*, by T. D. Yensen, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

*Alkali Vapor Detector Tubes*, by H. A. Brown and C. T. Knipp, both of the University of Illinois, Urbana, Ill.

AFTERNOON—2 P. M.—Clover Room

Presiding: Afternoon—N. W. Storer

*Operating Aspects of Railroad Transportation.*

(See page 8)

EVENING—8 P. M.—Metropolitan Opera House

Presiding: Evening—President Ryan

*Transportation Meeting at Metropolitan Opera House.* For list of speakers and other details, see "Railroad Sessions," page 8.

### Wednesday, February 6

MORNING—9:30 A. M.—South Garden

#### TECHNICAL SESSION (A)

Presiding: H. D. James

*Transient Performance of Electric Elevators*, by David Lindquist, Otis Elevator Co., New York, N. Y., and E. W. Yearsley, Electrical Engineer, Brooklyn, N. Y.

\* Deceased October 26, 1923.

*Variable Voltage Control Systems as Applied to Elevators*, by E. M. Bouton, Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

*A Novel Alternating-Current Voltmeter*, by L. T. Wilson, American Telephone & Telegraph Co., New York, N. Y.

*Oscillographic Study of Voltage and Current in Permeameter Circuit*, by W. B. Kouwenhoven, Dept. of Electrical Engineering, Johns Hopkins University, Baltimore, Md., and T. L. Berry, Jr.

*Power Plant Auxiliaries and Their Relation to Heat Balance*, by A. L. Penniman, Jr., Consolidated Gas, Electric Light & Power Co., Baltimore, Md.

MORNING—9:30 A. M.—Ball Room

#### TECHNICAL SESSION (B)

Presiding: H. M. Hobart

*Shaft Currents in Electric Machines*, by P. L. Alger, General Electric Company, Schenectady, N. Y., and H. W. Samson.

*Eddy Current Losses in Armature Conductors*, by R. E. Gilman,\* Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Tooth Pulsations in Rotating Machines*, by T. Spooner, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Surface Iron Losses with Reference to Laminated Materials*, by T. Spooner, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa., and I. F. Kinnard, General Electric Co., Lynn, Mass.

AFTERNOON

Dedication of the Moore School of Electrical Engineering at the University of Pennsylvania.

EVENING

*Dinner Conference on Engineering Education*

6:15 P. M.—An informal dinner meeting for all those interested in engineering education will be held under the joint auspices of the Educational Committee and the Society for the Promotion of Engineering Education. There will be a round table conference on the new project of the Board of Investigation and Co-ordination of the S. P. E. E. Speakers will include members of this Board and W. E. Wickenden, its Director of Investigations.

Members wishing to attend should report to convention headquarters not later than Tuesday evening, February 5th.

8 P. M.—Ball Room and Clover Room

*Illustrated Lecture on 220,000-Volt Transmission*, by Frank G. Baum, Consulting Engineer, San Francisco, Cal.

Entertainment and Dance.

\* Deceased.

### Thursday, February 7

MORNING—9:30 A. M.—Clover Room

#### TECHNICAL SESSION (A)

Presiding: G. A. Sawin

*Method of Testing Current Transformers*, by F. B. Silsbee, Physicist, Bureau of Standards, Washington, D. C.

*Recent Developments in Kilovolt-Ampere Metering*, by B. H. Smith, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa. and A. R. Rutter.

*Automatic Transmission of Power Readings*, by B. H. Smith, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa., and R. T. Pierce.

*Quadrant Electrometer for Measurement of Dielectric Loss*, by D. M. Simons and W. S. Brown, both of the Standard Underground Cable Co., Pittsburgh, Pa.

MORNING—9:30 A. M.—Ball Room

#### TECHNICAL SESSION (B)

Presiding: H. M. Hobart

*Recent Advances in the Manufacture and Testing of Static Condensers in Power Sizes*, by R. Marbury, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Effect of Time and Frequency on Insulation Tests of Transformers*, by V. M. Montsinger, General Electric Company, Pittsfield, Mass.

*Insulation Tests of Transformers as Influenced by Time and Frequency*, by F. J. Vogel, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Short Circuits of Alternating-Current Generators*, by C. M. Laffoon, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

AFTERNOON—2 P. M.—Ball Room

#### TECHNICAL SESSION

Presiding: O. B. Blackwell

*Economic Development of Step-by-Step Automatic Telephone Equipment*, by P. G. Andres, Automatic Electric Co., Chicago, Ill.

*High Quality Transmission and Reproduction of Speech and Music*, by W. H. Martin, American Tel. & Tel. Co., New York, N. Y., and H. Fletcher, Western Electric Co., New York, N. Y.

*Function and Design of Horns for Loud Speakers*, by C. R. Hanna and Joseph Slepian, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Certain Factors Affecting Telegraph Speed*, by H. Nyquist, American Tel. & Tel. Co., New York, N. Y.

EVENING—Ball and Clover Rooms  
Annual Dinner Dance—6:45 P. M.—  
Ball Room

### Friday, February 8

MORNING—9:30 A. M.—Ball Room

#### TECHNICAL SESSION (A)

Presiding: O. B. Blackwell

*Measuring Methods for Maintaining the Transmission Efficiency of Telephone Circuits*, by F. H. Best, American Tel. & Tel. Co., New York, N. Y.

*Radio Telephone Signaling—Low Frequency Systems*, by C. S. Demarest and Milton L. Almquist, American Tel. & Tel. Co., New York, and Lewis M. Clement, Western Electric Co., New York.

*Telephone Transformers*, by W. L. Casper, Western Electric Co., Inc., New York, N. Y.

*An Electrical Frequency Analyzer*, by R. L. Wegel, and C. R. Moore, both of the Western Electric Co., Inc., New York, N. Y.

MORNING—9:30 A. M.—North Garden

#### TECHNICAL SESSION (B)

Presiding: H. M. Hobart

*Multiple System of Cooling Large Turbo-Generators*, by Donald Bratt, Brooklyn Edison Co., Brooklyn, N. Y.

*An Experimental Study of Ventilation of Turbo-Alternators*, by C. J. Fechheimer, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

*Importance of Brush Mounting*, by P. C. Jones, Goodyear Tire and Rubber Co., Akron, Ohio.

*Theory of Three-Circuit Transformer*, by A. Boyajian, General Electric Co., Pittsfield, Mass.

AFTERNOON

Visit to Bethlehem Steel Company.

EVENING

Entertainment and visit as guests of Lehigh Valley Section at Lehigh University.

## SPECIAL FEATURES

Among the special features of the Convention are the celebration of the Fortieth Anniversary of the Institute; a series of talks by railroad officials and other prominent men; the presentation of the Edison Medal and the dedication of the Moore School of Electrical Engineering.

The technical program includes papers on transmission, telephony, electro physics and other timely engineering subjects.

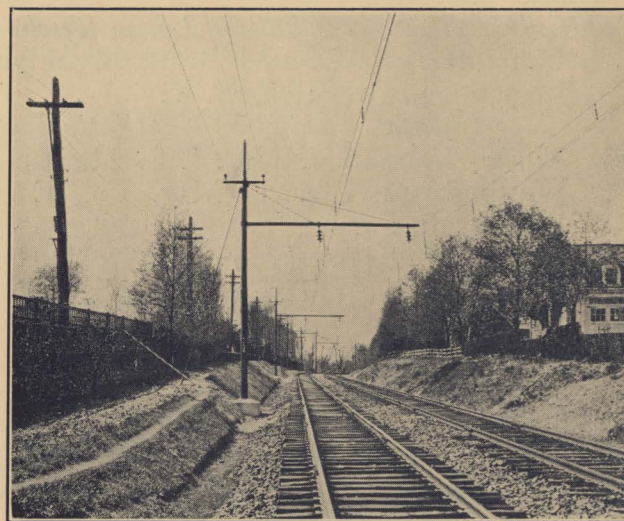
### PRESENTATION OF EDISON MEDAL

The Edison Medal will be presented to John W. Lieb, Vice-President, New York Edison Company, on the evening of Monday, February 4. The medal is awarded annually for meritorious achievement in electrical science, electrical engineering or the electrical arts. Mr. Lieb is the fourteenth medalist.

### CELEBRATION OF 40TH ANNIVERSARY

Forty years ago the American Institute of Electrical Engineers was founded. This Convention therefore celebrates the anniversary of the Institute. Monday evening has been set apart for a specific anniversary program, at which meeting three of the founders, Elmer A. Sperry, T. C. Martin and Elihu Thomson, will relate the early history of the organization and some of the developments which followed. The story of the evolution of the Institute to its present functions and achievements, will be presented by John J. Carty.

The Institute had its inception at a preliminary meeting, April 15, 1884. At a meeting on May 13, 1884, the first president, Dr. Norvin Green, and the following six Vice-Presidents were elected: Alexander Graham Bell, Thomas A. Edison, Charles H. Haskins, Charles R. Cross, George A. Hamilton, Franklin



TYPICAL TROLLEY CONSTRUCTION, CHESTNUT HILL LINE  
—PHILADELPHIA  
Showing 3,300-volt, 60-cycle Signal Transmission Line

L. Pope; also, Rowland R. Hazard as treasurer, and Nathaniel S. Keith as secretary.

**FIRST TECHNICAL MEETING**—October 7-8, 1884, in Philadelphia during the International Electrical Exhibition, held under the auspices of the Franklin Institute.

**CHARTER MEMBERS** who are still on the Institute membership list, January 1, 1924: Adam Bosch, Charles F. Brush, Charles L. Clarke, E. N. Dickerson, Thomas A. Edison, George A. Hamilton, Nathaniel S. Keith, Thomas D. Lockwood, C. O. Mailloux, T. C. Martin, Jesse M. Smith, Elmer A. Sperry, Elihu Thomson, Edward Weston.

**PRESIDENTS, 1884-1924:** Norvin Green, Franklin L. Pope, T. Commerford Martin, Edward Weston, Elihu Thomson, William A. Anthony, Alexander Graham Bell, Frank J. Sprague, Edwin J. Houston, Louis Duncan, Francis Crocker, A. E. Kennelly, Carl Hering, Charles P. Steinmetz, Charles F. Scott, Bion J. Arnold, John W. Lieb, Schuyler S. Wheeler, Samuel Sheldon, Henry G. Stott, Louis A. Ferguson, Lewis B. Stillwell, Dugald C. Jackson, Gano Dunn, Ralph D. Mershon, C. O. Mailloux, Paul M. Lincoln, John J. Carty, H. W. Buck, E. W. Rice, Jr., Comfort A. Adams, Calvert Townley, A. W. Berresford, William McClellan, Frank B. Jewett, Harris J. Ryan.

**MEMBERSHIP:** January 1, 1924—15403

### RAILROAD SESSIONS

On Tuesday afternoon and evening, the engineering and economic aspects of transportation will be presented by executives and operating officials of the railroads and other speakers of national prominence. The afternoon session will be devoted to railroad operation, at which meeting papers will be presented by L. C. Fritch, Vice-President, Chicago, Rock Island and Pacific R.R., and L. G. Coleman, Asst. General Manager, Boston and Maine R. R. There will be short talks by W. M. Whitendon, Vice-President, Missouri Kansas and Texas R.R.; F. E. Williamson, General Supt., New York Central R.R.; A. G. Trumbull, Chief Mechanical Engineer, Erie R.R.; W. L. Bean, Asst. Mechanical Engineer, New York, New Haven and Hartford R. R.; C. P. Dampman, Supervisor of Fuel Conservation, Philadelphia and Reading R. R.; J. E. Crawford, Assistant General Manager, Norfolk and Western Rwy. Co., and others.

The evening meeting will be held at the Metropolitan Opera House. The list of speakers and their subjects will be as follows:

- E. G. Buckland, Vice-President, New York, New Haven and Hartford R. R.
- "The Place of Transportation in Civilization."*
- F. H. Sisson, Vice-President, Guarantee Trust Company.
- "The Credit Question in Transportation."*
- Ralph Budd, President, Great Northern R.R.
- "Transportation and the Rural Situation."*
- H. B. Thayer, President, American Tel. & Tel. Co.
- "The Public's Transportation Problem."*
- A. J. County, Vice-President, Pennsylvania R.R.
- "Solid Foundations for Better and Cheaper Transportation Service."*

These speeches will be broadcast simultaneously throughout the United States—from the New England Coast to the Rocky Mountains, through the courtesy of the American Telephone & Telegraph Co., The Westinghouse Electric & Manufacturing Co., and the General Electric Company.

**DEDICATION OF NEW MOORE SCHOOL**—The new Moore School is the first School of Electrical Engineering to be endowed as such. This school, which forms part of the University of Pennsylvania, will be dedicated on Wednesday afternoon, February 6. The exercises will be held in Weightman Hall (gymnasium) at 3 P. M. The University authorities in arranging for the ceremony have planned for an interesting and profitable visit for the Institute members as guests of the University. Following the exercises a reception will be held in the Library. A light collation will be served.

### ENTERTAINMENT

**FOR THE LADIES**—The Rose Garden on the Bellevue-Stratford Roof has been set aside for the week as a headquarters for the ladies. Every morning except Monday and every afternoon except Friday music will be provided. Facilities for playing bridge and other card games will be furnished. Tea will be served every afternoon at 4:30 o'clock. A Women's Reception Committee will be on duty at all times.

## Places of Interest in Philadelphia

**PHILADELPHIA** is particularly rich in objects of historical interest dating from William Penn's time in the 17th Century. Most famous of course is Independence Hall, which holds the Liberty Bell and in which the Declaration of Independence was signed. Next in fame probably is Valley Forge which is nineteen miles out of Philadelphia and is preserved as a state reservation. There are numerous other historically interesting landmarks, many of which are included in the following list.

**INDEPENDENCE HALL**—Begun in 1732 and completed in 1741. In this building the Declaration of Independence was signed and the Constitution was framed and adopted; Washington was appointed Commander-in-Chief of the American forces and the Continental Congress met from 1775 till the close of the Revolution. The Liberty Bell and many other relics repose here.—6th and Chestnut Streets.

**BETSY ROSS HOUSE**—Where Betsy Ross sewed the first flag of the Stars and Stripes under Washington's direction.—229 Arch Street.

**CONGRESS HALL**—Temporary capital of the Nation where Washington (for second term) and John Adams were inaugurated and Thomas Jefferson presided over the U. S. Senate—6th and Chestnut Streets.

**MONDAY EVENING**—On Monday evening, after the Fortieth Anniversary Meeting and Edison Medal presentation in the Ballroom, a "Get-together on the roof" has been arranged. Dancing will begin promptly after the close of the presentation ceremonies.

**WEDNESDAY EVENING**—On Wednesday evening an entertainment in the Ballroom will begin with a moving picture at 8. Entertainment from the stage at 9, to be followed by an informal dance. Music of twelve pieces from 9 to 12.

**THURSDAY EVENING**—President's reception and dinner dance in Ballroom and Clover Room at 6:45.

**SIGHTSEEING**—A Committee will be available at all times to assist those desiring to view Philadelphia's points of interest.

### LEHIGH VALLEY SECTION

On Friday afternoon a special trip has been arranged to visit the Bethlehem Steel Company's plant at South Bethlehem, Pa., after which the Lehigh Valley Section will arrange for a dinner and entertainment at Lehigh University Commons, with short addresses by President Richards of Lehigh and President McCracken of Lafayette.

**VALLEY FORGE**—Chief objects of interest are Washington's headquarters (1777-1778), Washington Inn, Wayne Monument National Arch and the Memorial Chapel. This is a 450-acre state reservation, nineteen miles from Philadelphia, and is reached by the Philadelphia and Reading Railroad or by automobile.



PHILADELPHIA PARKWAY AND APPROACH TO FAIRMOUNT PARK

**CARPENTER'S HALL**—Where the first Continental Congress met.—Chestnut Street below 4th.

**OLD CITY HALL**—Where the first Supreme Court of the United States met.—5th and Chestnut Streets.

**PENN TREATY PARK**—In 1682 William Penn concluded his treaty with the Indians on this site.—Shackamaxon St. and Delaware River.

**FRANKLIN'S GRAVE**—In Christ Church burial ground.—5th and Arch Streets.

**GLORIA DEI (Old Swedes) CHURCH**—Oldest structure in Philadelphia.—Swanson Street below Christian.

**CHRIST CHURCH**—Built in 1731 and is the church in which Franklin and Washington worshipped and where Robert Morris, Francis Hopkinson and other Colonial figures are buried.—2nd Street above Market.

**FIRST PRESBYTERIAN CHURCH**—Had the first Presbyterian congregation in America.—7th Street and Washington Square.

**UNIVERSITY OF PENNSYLVANIA**—Founded in 1740 by Benjamin Franklin. It has now 75 buildings on 117 acres of campus, enrolling 15,000 students. Of particular interest

are the Museums of Science, Art, and Archaeology and the zoological and anatomical collections.

**AMERICA'S OLDEST BANK BUILDING**—Now occupied by Girard National Bank.—116 South 3rd Street.

Among the modern places of general interest are the following:

**UNITED STATES MINT**—Where two-thirds of the coinage of the country is made.—16th and Spring Garden Streets.

**NAVY YARD**—League Island Navy Yard, four miles from City Hall, is one of the largest in the country.—Foot of Broad Street.

**CITY HALL**—The tower is 548 feet above the street level. From this tower, surmounted by the statue of Wm. Penn, a fine view of the city and surrounding country may be had—Its 662 rooms cover a floor space of 14½ acres. Hanging stairways at the four corners are of unusual and interesting construction.

**THE PARKWAY**—This thoroughfare, partly completed, will be the site of an art museum, a public library and other large buildings.

**BALDWIN LOCOMOTIVE WORKS** — Largest locomotive works in the world, covering nine city blocks.—Broad and Spring Garden Streets.

Of interest particularly to engineers are the following:

**FRANKLIN INSTITUTE** — Where many of the earliest researches and experiments in the science of electricity were carried out. The Institute includes a museum where very old types of electrical equipment are on display.—15 South Seventh Street.

**THE PHILADELPHIA ELECTRIC COMPANY**—Delaware Station is of special interest as it has five 33,333-kv-a. generating units installed with provision for one more of the same rating in 1924. Chester Station and other plants also are of interest.

**UNITED GAS IMPROVEMENT COMPANY**—This company controls electrical subsidiaries in Norristown and Ardmore, Pa., and elsewhere.

**BELL TELEPHONE COMPANY OF PENNSYLVANIA**—Its Bell Parkway Building is one of the most completely equipped telephone buildings in the world. This Company has recently placed in operation the first of its modern machine switching exchanges.

**RAILROADS**—The Pennsylvania, Broad and Market Streets; The Baltimore & Ohio, 24th and Chestnut Streets; The Philadelphia & Reading, 12th and Market Streets.

**CURTIS PUBLISHING COMPANY**—Largest and most splendidly housed publishing plant in the world.—Occupies block bounded by Sixth, Seventh, Sansom and Walnut Streets.

**FAIRMOUNT PARK**—Comprises 3526 acres of ground on both sides of the Schuylkill River, and is connected to the center of the city by the Parkway. Contains many well preserved colonial buildings.

**GIRARD COLLEGE**—Founded by Stephen Girard for the education of orphan boys. There are forty acres, containing twenty buildings surrounded by an imposing stone wall. The main building is a marble reproduction of the famous Parthenon of Athens.—Corinthian and Girard Aves.

## A LITTLE WALK TO HISTORIC SHRINES

From Broad and Chestnut Streets, an eastward course leads to Congress Hall at Sixth Street, and adjoining it in the center of the block is Independence Hall. At the corner of Fifth Street, the first Supreme Court of the United States convened. Between Third and Fourth Streets on the south side is the court that leads to Carpenters' Hall. On Third Street below Chestnut is America's oldest bank building, now occupied by the Girard National Bank. Turning north on Second Street, between Market and Arch Streets, will be found Christ Church, where Washington and other personages worshipped. Betsy Ross is said to have sewed the first Old Glory at 229 Arch Street. At Arch and Fifth Streets, is the grave of Benjamin Franklin. On Seventh Street, below Arch (37 North Seventh Street) is the site of the first U. S. Mint, the first bit of real estate ever owned by the U. S. Government. At the South West Corner of Seventh and Market stood the house where Thomas Jefferson wrote the Declaration of Independence. The

venerable Franklin Institute is at 15 South Seventh Street. From Seventh Street westward on Market Street to City Hall, are the majority of the large department stores.

## INSPECTION TRIPS

The following companies have courteously offered to open their plants for inspection by members and guests of the Institute, either individually or in groups, at the times indicated. The A. I. E. E. Convention Badge will be accepted as sufficient identification for direct admission to plants, or for the issuance of passes, where such are required. Guides will be furnished by the various companies. Complete information, including directions for reaching the plants and transportation facilities available, can be obtained at the Registration Booth. Members and their guests are requested to indicate at the Registration Booth their desire to visit any particular plant twenty-four hours in advance, in order that suitable arrangements can be made.

**THE PENNSYLVANIA RAILROAD CO.** will have on exhibit during the convention, at its West Philadelphia Yard (Market and 33rd Streets) a very complete line of their latest steam and electric locomotives. This exhibit will include:

A 10-wheel type, medium weight, steam locomotive for heavy local passenger service.

A Pacific type steam locomotive for heavy passenger service.

A Mountain type steam locomotive for heavy passenger and fast through freight service.

A Decapod type steam locomotive for heavy freight service.

A Mallet (articulated type) steam locomotive for pusher service on mountain grades.

A split-phase electric locomotive for heavy freight service.

A single-phase, commutator type electric locomotive for both heavy freight and fast passenger service.

A multiple unit electric train for suburban passenger service.

This exhibit will be available for inspection in daylight hours throughout the convention. Guides will be in attendance to explain the details of the apparatus.

The following substations of the Pennsylvania Railroad will also be available for inspection:

The West Philadelphia Substation of the electrified system, located adjacent to the West Philadelphia Yards.

The Somerset St. Substation, which is located at Trenton Avenue and Somerset St.

The Arsenal Bridge Substation, located on the west bank of the Schuylkill River below South Street.



PART OF THE CITY'S RIVER FRONT

Philadelphia has along the Delaware and Schuylkill Rivers thirty-seven miles of river front navigable by ocean steamers. New Philadelphia Electric Power Plant in the center.

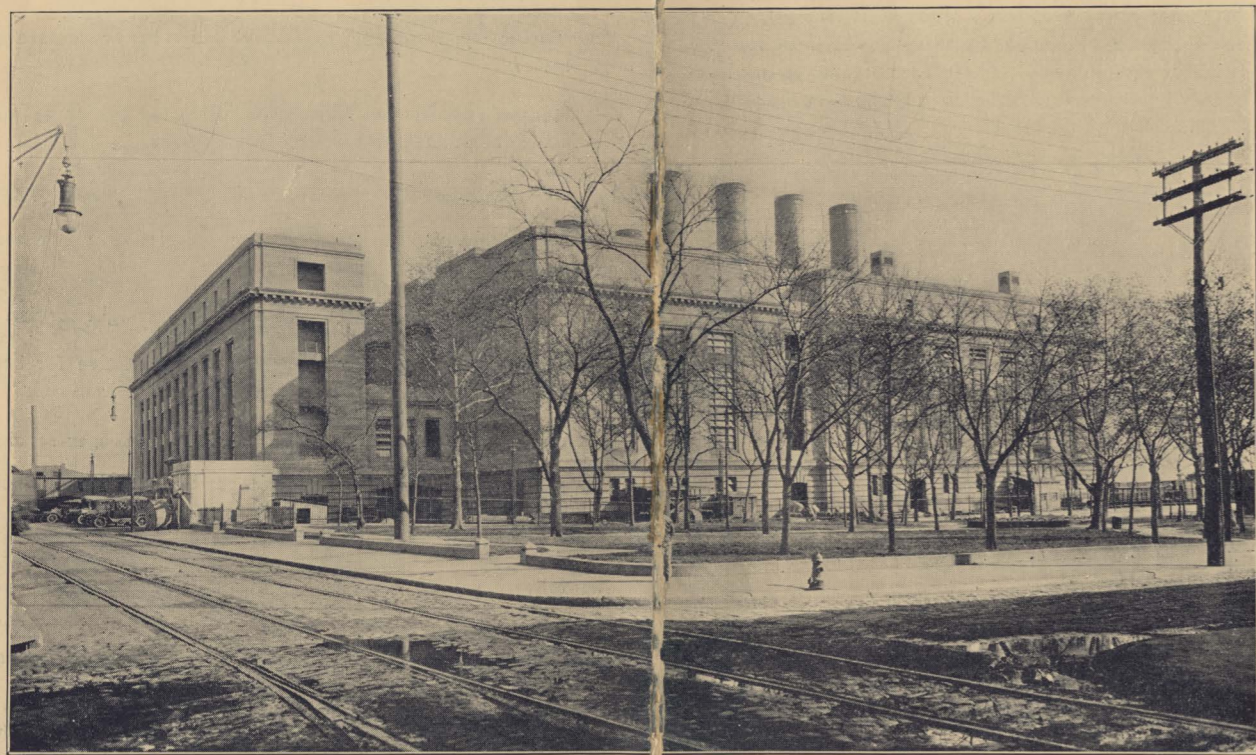
—Courtesy of the Corn Exchange National Bank

**UNIVERSITY OF PENNSYLVANIA**—All the buildings and equipment of the University of Pennsylvania will be available for inspection throughout the convention. There will be an exhibit in the Engineering Building of some of the latest devices from the research laboratories of the General Electric Co., the Westinghouse Electric & Manufacturing Co., the Western Electric Co., the Radio Corporation of America, the Leeds & Northrup Co., the Atwater-Kent Manufacturing Works, the Brown Instrument Co., and other representative Philadelphia manufacturers. Those desiring to visit this interesting exhibit and the various buildings of the University of Pennsylvania will be provided with information and guides at the Moore School of Electrical Engineering, 33rd and Locust Streets. Information desk at the west entrance.

**WESTINGHOUSE ELECTRIC & MANUFACTURING CO.**

—Delegates are invited to visit the shops of the Westinghouse Electric & Manufacturing Co., at Essington, on Tuesday, Wednesday and Thursday afternoons. Arrangements will be made to have busses or automobiles leave the Bellevue-Stratford at 2 P. M., reaching the hotel on return about 6 P. M. There are under construction at these shops steam turbines from 1/2 KW. to 50,000 KW. capacity in various stages of completion; jet condensers of various sizes, and surface condensers in size from 1,000 sq. ft. to 50,000 sq. ft. condensing surface. Delegates desiring to visit the Westinghouse shops will please signify their intention at the Registration Booth a day in advance, so that transportation can be provided.

The District Sales Offices of the company are located in the Widener Building, Chestnut and Juniper Streets.



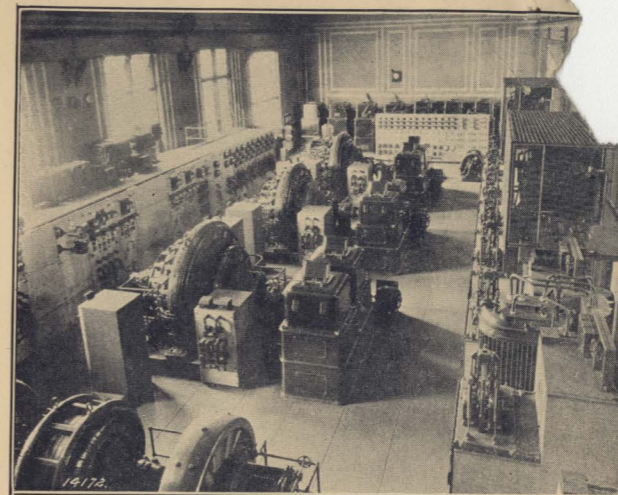
PENN TREATY PARK AND DELAWARE STATION OF PHILADELPHIA ELECTRIC COMPANY  
(Under great elm, which blew down in 1910, William Penn signed treaty with Indians in 1682)

**P. MORRIS CO. & THE WM. CRAMP & SONS SHIP & ENGINE BUILDING CO.,** at Richmond and Norris Streets.

There is now under construction by the I. P. Morris Co., a 70,000 H.P. hydraulic turbine, which will form one of the two largest hydraulic generating units in the world. The shops will be available for inspection mornings and afternoons during the convention.

The Navy Department will permit delegates to the convention to inspect the three fast light cruisers now under construction at the yards of the Wm. Cramp & Sons Ship & Engine Co. These cruisers while not electrically driven have many interesting electrical features. This permission is strictly limited to American citizens.

**THE PHILADELPHIA ELECTRIC CO.**—The Schuylkill Station of The Philadelphia Electric Co., located at the foot of Christian Street on the east bank of the Schuylkill River, from which 25-cycle current is supplied for the Pennsylvania electrification, will be available for inspection. Also the Delaware Station, located on the Delaware River at Beach and Palmer Streets. This station is of particular interest, as it contains five 33,333-kva. generating units. The Philadelphia Electric Co. also has a number of modern sub-stations. The above generating stations and any of the substations are available for inspection throughout the convention, and guides will be supplied to conduct visitors throughout the plants. Delegates desiring to inspect these plants will please indicate their desire at the Registration Booth.



RANSTEAD SUBSTATION, PHILADELPHIA ELECTRIC CO.

**THE BELL TELEPHONE COMPANY OF PENNSYLVANIA**

—The Parkway Building of the Bell Telephone Co., located at 17th and Arch Streets, can be visited at any time during the convention. Guides will be provided to explain the points of interest in the building. This building contains all the different groups of telephone exchange equipment and long distance switchboards. An automatic machine exchange can also be seen in this building in process of installation. The Bell Co.'s exchange at 57th and Chestnut Streets, which has a complete machine switching station in actual operation, will also be open for inspection.

**THE BALDWIN LOCOMOTIVE WORKS**—Delegates may inspect the Philadelphia or Eddystone plants of the Baldwin Locomotive Works on Tuesday, Wednesday or Thursday. Guides will be supplied to show the delegates through the works.

**KEYSTONE TELEPHONE CO.**—The Race Exchange of the Keystone Telephone Co., located at 16th and Summer Streets, will be open for inspection. At this station, there is a machine operated exchange and a manually operated long distance exchange. Also a shop where telephone switchboards are built and telephone instruments assembled. The building will be available for inspection throughout the convention during daylight hours and guides will be supplied to explain points of interest to visiting delegates.

**U. S. NAVY YARD**—The League Island Navy Yard, located at the foot of Broad Street, is one of the largest yards in the country. The yard will be open to visitors every day during the convention from 9 A. M. to 4:30 P. M. One of the points of greatest interest at the Yard is the Navy Aircraft factory.

**GENERAL ELECTRIC CO.**—The General Electric Co.

will be glad to have delegates visit its Switchboard Factory and Service Shops, or to supply at its District Office in the Witherspoon Building, information in reference to any of the apparatus manufactured by the company.

**G. BRILL CO.**—The plant of the J. G. Brill Company will be available for inspection throughout the convention.

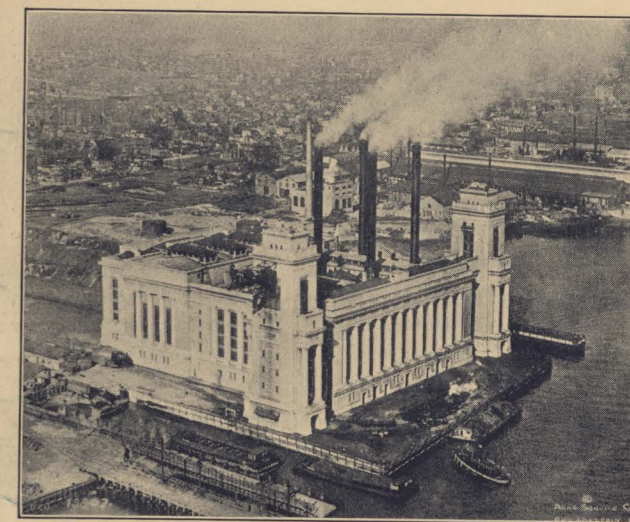
**PUBLIC SERVICE ELECTRIC CO. OF NEW JERSEY**—The Public Service Electric Co. of New Jersey will be glad to show any of its stations and substations to delegates and will provide automobile transportation to points of interest.

**COUNTIES GAS & ELECTRIC CO.**—The Counties Gas & Electric Co. invites the delegates at the convention to visit its new generating station at Norristown, Pa. Those desiring to visit this station are requested to register at the Registration Booth a day in advance, in order that transportation arrangements may be provided.

**TRANSPORTATION**

At the Registration Booth the Transportation Committee has arranged an Information Bureau, with a representative in attendance at all times.

The *Certificate Plan Arrangement* of reduced fares has been granted, assuming that 250 or more would take advantage of this plan. To secure this reduced fare, it is necessary to have the certificates, which were furnished at the time the tickets to Philadelphia were purchased, endorsed by the A. I. E. E. representative at the Registration Desk during the convention and validated by the Trunk Line Association representative also at the Registration Desk on February 6th or 7th between 8:30 A. M. and 5:30 P. M. This certificate properly endorsed, enables its holder to secure return transportation via the same route at one-half the one way rate. This reduced fare also applies to the families of the A. I. E. E. members. Any ticket which costs 67c or more for one way and accompanied by the certificate counts toward the total of 250 and helps to secure the reduced fare for others.



AIRPLANE VIEW OF CHESTER GENERATING STATION OF THE PHILADELPHIA ELECTRIC CO.

**THROUGH SLEEPERS AND PARLOR CAR**

over the Pennsylvania, Baltimore and Ohio, Philadelphia and Reading, between Philadelphia and main points in New England, the South, West and North.

The reduced fare tickets are not good on certain of the through trains. This should be checked and reservations should be made as early as practicable through the railroad representatives at the Information Desk or at the ticket offices of the System involved. The last date on which the reduced fare tickets are good for return trip leaving Philadelphia is February 12th.

Certain of the through trains between New York and the West, over the Pennsylvania, stop only at North Philadelphia, while some of the through Southern trains stop only at West Philadelphia. The tickets purchased should be from Philadelphia to destination, but it will be necessary to take a local train from Broad Street Station to North Philadelphia or West Philadelphia for connections to these trains.

Baggage may be checked from the hotel to destination by the head porters of hotels, or at the Railroad Ticket Offices after the purchase of railroad tickets.

A limited number of *Automobiles* bearing the A. I. E. E. symbol will be available for short trips around Philadelphia for out-of-town members in attendance at the Convention, the registration badge being the only identification necessary for the use of these machines.

**MEETING AT BETHLEHEM FRIDAY**—Extra coaches on the regular train of the Philadelphia and Reading leaving the Reading Terminal at 12th and Market Streets., at 12:40 P. M., arriving at Bethlehem 2:20 P. M., will be provided for the trip to Bethlehem on Friday P. M., February 8th, returning in the evening, as follows:

<i>Leave</i>		<i>Arrive</i>
Bethlehem .....	6:32 P.M. Phila. ....	8:08 P.M.
Bethlehem .....	7:34 P.M. Phila. ....	9:10 P.M.
Bethlehem .....	9:00 P.M. Phila. ....	10:52 P.M.

Automobiles will be provided at Bethlehem for transportation between the station and destination.

Tickets for box lunch costing \$1.00 may be had in advance at the Information Desk by those making the trip to Bethlehem, Friday. No dining car service on this train.

In the event 125 or more individuals signify their intention of making the trip to Bethlehem, a special train will be provided, in lieu of the above. This will take the members direct to the Bethlehem Steel plant and return so as to reach Philadelphia at approximately 10 o'clock.

**SIDE TRIPS**—The "Playground of the World," Atlantic City, and Seashore points, also New York, are conveniently located and frequent train service is available.

The following are City Ticket Offices:

Baltimore & Ohio, 1343 Walnut St., Phila., Pa.; Phila. & Reading, 1341 Chestnut St., Phila., Pa.; Pennsylvania, 1539 Chestnut St., Phila., Pa.

Information may be obtained, tickets purchased, baggage checked and reservations made also at the regular railroad stations.

P. M. ENGLI

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CONVENTION HEADQUARTERS  
BELLEVUE-STRATFORD HOTEL, BROAD AND WALNUT STREETS

**RULES GOVERNING PRESENTATION AND DISCUSSION OF PAPERS**

At technical sessions papers may be read by title only, or by abstract, as determined by the Meetings and Papers Committee.

Papers not read by title will be read in abstract. The time for presentation must not exceed twenty minutes if there is only one paper to be presented at the session, or ten minutes if two or more papers are to be presented.

Members desiring to discuss a paper should notify the Meetings and Papers Committee, or the Chairman of the meeting, in advance of the meeting. Such members will be allowed not to exceed ten minutes each for discussion before any other members are given an opportunity to discuss the paper.

Written discussion submitted in advance by an absent member may be read by some member who is present, and five minutes may be allowed for its presentation.

In the open discussion following the presentation of the discussion by letter and by members who have given advance notification, each member will be allowed five minutes unless additional time is available after all others who desire to speak have been heard.

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