

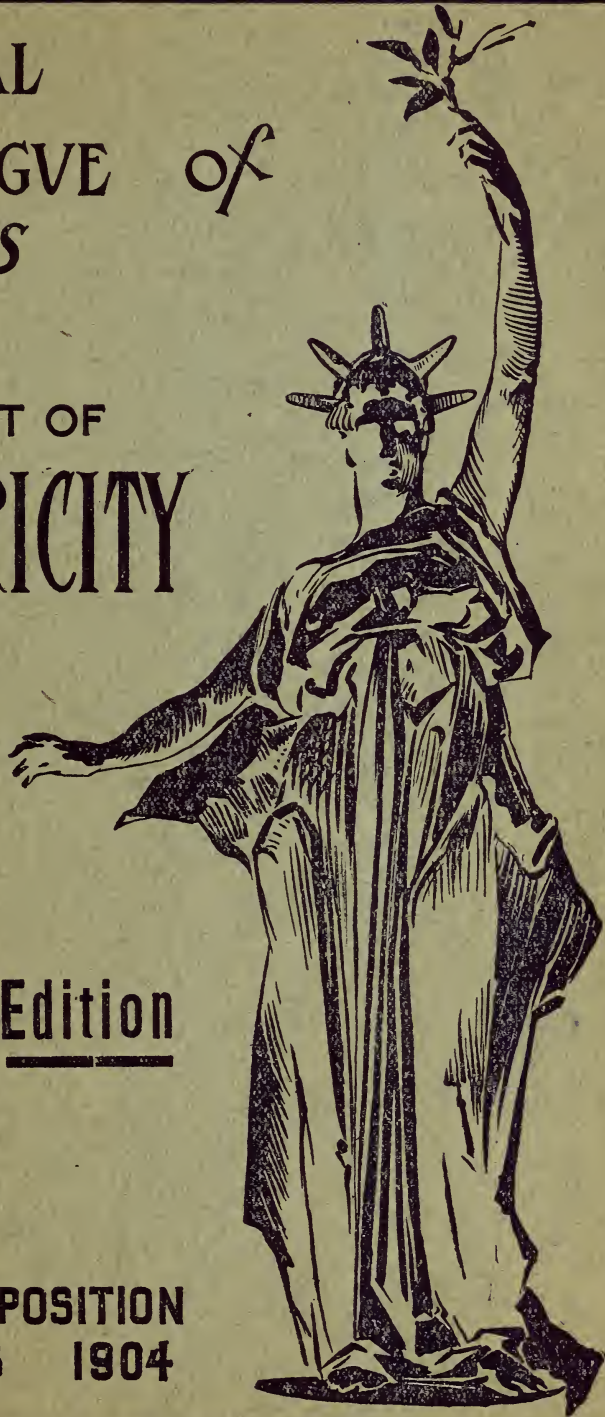
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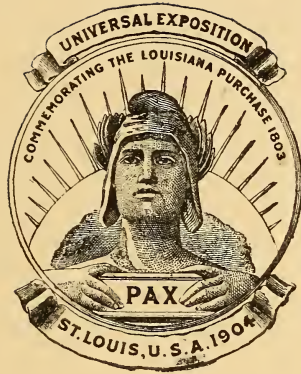
DEPARTMENT OF

ELECTRICITY

Revised Edition

UNIVERSAL EXPOSITION
SAINT LOUIS 1904





OFFICIAL CATALOGUE
OF
EXHIBITORS



UNIVERSAL EXPOSITION
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1904

DIVISION OF EXHIBITS
FREDERICK J. V. SKIFF, Director

DEPARTMENT F
ELECTRICITY
W. E. GOLDSBOROUGH, Chief

REVISED EDITION

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INTRODUCTION.

INSTALLATION PLAN OF EXHIBITS IN THE PALACE OF ELECTRICITY.

BY W. E. GOLDSBOROUGH, CHIEF.

THE Palace of Electricity occupies a central position on the Exposition grounds. It is a fine exhibit structure, pentagonal in shape, and surrounds a spacious court. Its east front borders on the Grand Basin, and from its southern exposure the Terrace of States and the Cascades are in full view.

The exhibits within this palace cover all of the modern applications of electricity, and each department of education, science and industry, associated with electricity, is represented in about equal measure.

The retrospective exhibit is confined very largely to the fine demonstration made in honor of Thomas Alva Edison, in Blocks 26 and 27. This exhibit is arranged in honor of Mr. Edison on account of the fact that 1904 is the twenty-fifth anniversary of the commercial perfection of the incandescent lamp, the agent which has been used so effectively in beautifying the Exposition.

The exhibits which show the commercial development of electricity effectively, in that they represent its adaptation in industry, are located in the west end of the Palace of Machinery and in the west section of the Palace of Electricity. In the Palace of Machinery, large direct connected operating units ranging in capacity up to 3500 K. W., and of wide variety, are connected with auxiliary exciting and switchboard appliances, as a part of the exhibitors' service power plant, and present very imposing and animated pictures.

In the Palace of Electricity many exhibits in Blocks 3, 4, 5, 6, 7, 8, 9, 14, 15, 16, and 17, show to what perfection electrical appliances have been brought in adapting electric power to the requirements of almost every branch of industry, enabling operations involving the use of large amounts of power to be performed with greater certainty, greater regularity and greater delicacy of action than have ever before been possible.

In the southwest section of the building will be found the principal exhibits illustrating the use of the storage battery in connection with lighting plants, railways, telephone exchanges and other uses. All of these exhibits are working exhibits, by which is meant that the machinery is in operation, bringing its adaptability to the work in hand vividly to the mind by actual demonstrations.

The application of electricity to railways has not been overlooked, and in both the northwest and southeast quarters of the building will be found fine demonstrations of the most modern apparatus. In addition, an extensive series of equipments are in operation on the experimental test tracks, which lie north of the Palace of Transportation, under the supervision of the Department of Electricity. Near the west end of the Palace of Forestry, Fish and Game is a comprehensive installation, showing applications of electric track signalling and controlling apparatus, installed by the German Government as a part of its electrical display.

The use of electricity in lighting is also shown in the exhibits in the northwest and southeast sections of the building. There are a number of unique devices displayed showing the perfection to which the art of decorative and useful lighting has been brought through the agency of electricity.

In the eastern end of the French exhibit in Section 38, is a particularly fine arrangement of electric fixtures. These are new and possess high artistic merit, and will undoubtedly attract a great deal of attention.

Instruments of precision for making electrical measurements are shown in exhibits located in the southeast quarter of the building. Notable among these is the model electrical testing laboratory which has been installed by the National Bureau of Standards. The laboratory probably contains one of the finest equipments of electrical scientific apparatus that has ever been brought together.

In the eastern half of Section 7, where the electrical exhibit of Great Britain is located, and in the eastern half of Section 18, in which the Italian exhibit is located, are displayed a large and very fine assortment of instruments by European manufacturers. These exhibits are supplemented by a fine display of electrical instruments of German manufacture, arranged in the Palace of Education.

In the south and southeast sections are the principal exhibits illustrating the use of electricity in the transmission of intelligence. There are two elaborate working exhibits, showing the development in the art of telephony, and a number of other working exhibits demonstrating automatic control and other specialties in this field; one of the most important of these illustrates the use of the telephone as an aid in enabling the deaf to hear, and in teaching the dumb to speak. In this section of the building are also some of the principal wireless telegraph and wireless telephone exhibits. The largest of the wireless telegraph stations in the Palace of Electricity consists of three towers standing 75 feet in the clear, within the building. The height of these towers gives a very good idea of the fine proportions of this exhibit palace.

Outside of the Electricity Building there are two wireless telegraph stations. One of these consists of a tower 300 feet high, erected near the Press Building, north of the Palace of Liberal Arts. The other station consists of a mast 225 feet high, erected on the hill south of the Japanese Building and southeast of the Ferris Wheel.

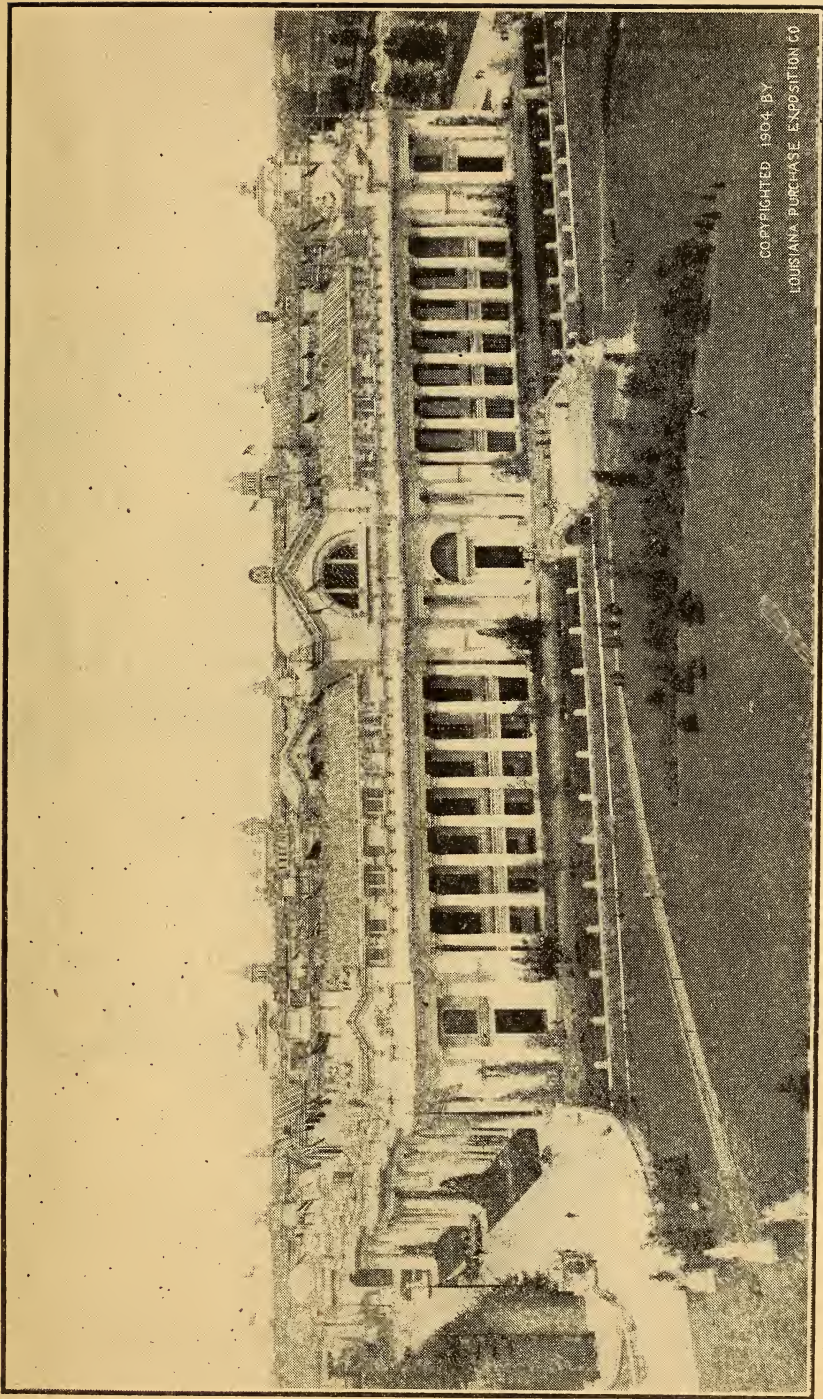
The exhibits of wireless telephony are also of special interest to the public, as they bring very vividly before the observer the wonderful advance that is now being made in this department of scientific attainment.

The other advances which have been made in a scientific way are brought out most pointedly in the exhibits in the southeast and north central sections of the building.

The scientific application of electricity to medicine is shown by the exhibits in the eastern part of Section 4, where all the modern developments for the treatment of diseases by the aid and use of electricity are presented.

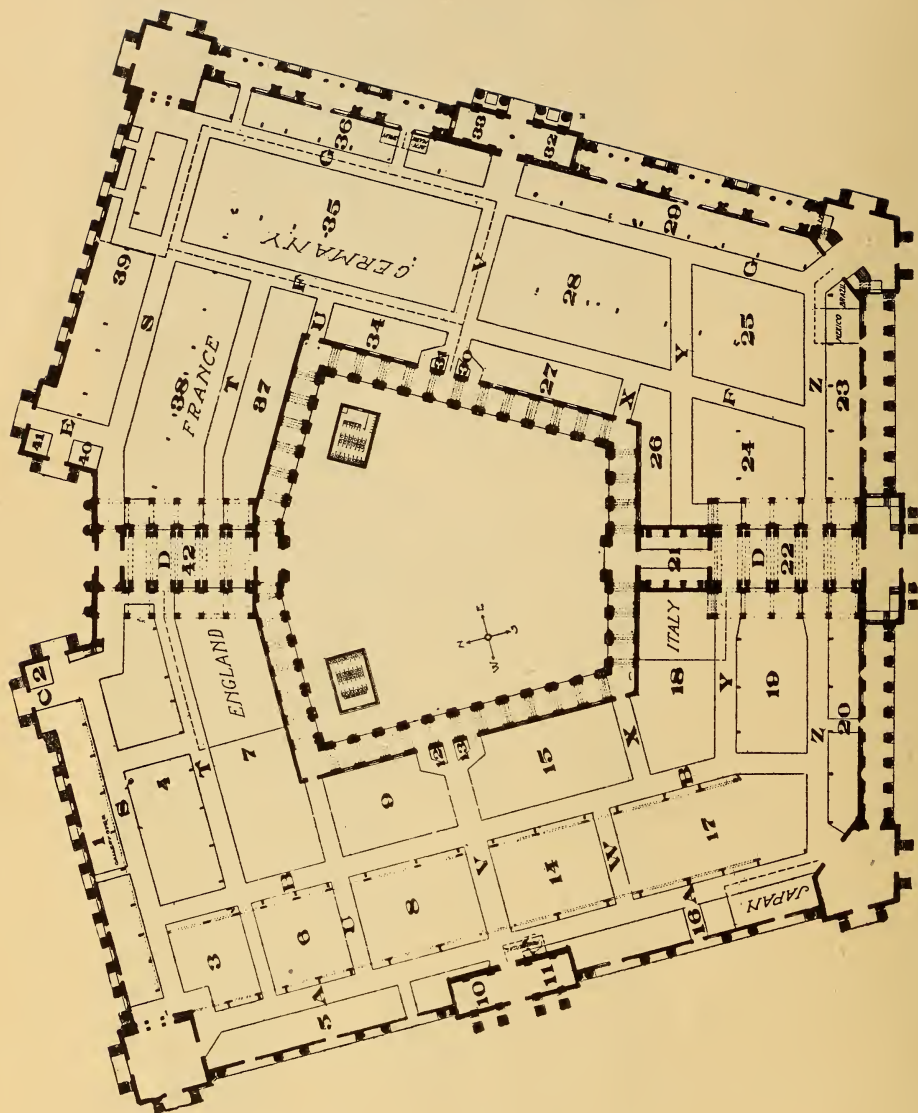
The advance in chemistry, to which electro-chemistry has contributed so marked and extensive a part, especially within the last few years, is brought out in a very striking way in the exhibit of Germany in Section 35. This is probably to the electro-chemical engineers, the most interesting exhibit in the Palace of Electricity.

Although in this brief statement many fine installations have not been mentioned, an idea is given of the extensive and comprehensive character of the presentation of electricity.



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PALACE OF ELECTRICITY.



PLAN OF PALACE OF ELECTRICITY SHOWING LOCATION OF EXHIBITS.

How to Find an Exhibitor.

The Palace of Electricity, a ground plan of which accompanies this catalogue, is arranged in blocks, with aisles, like the squares and streets of a well-planned city. Aisles are lettered and numbered. Blocks are numbered, and over each block is suspended a large sign which indicates the number of the block beneath. In every case the location of the Domestic exhibitor by block and aisle is given. The locations of foreign exhibit sections are given on the ground plan.

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Department of Electricity.

OFFICIAL CLASSIFICATION OF EXHIBITS.

GROUP 67.

MACHINES FOR GENERATING AND USING ELECTRICITY.

- Class 428. Apparatus for generating electricity; dynamos producing direct, simple, alternating or multiphase currents.
- Class 429. Motors for direct or alternating currents.
- Class 430. Modification of currents. Motor-generators. Rotary converters. Transformers.
- Class 431. Application to transportation; electric motors for railways and roadways. Methods of control of cars and trains.
- Class 432. Application to mechanical purposes; elevators, winches, cranes, capstans, transfer tables, printing presses, machine tools, traveling cranes, fans.
- Class 433. Appliances and methods for the distribution of electric energy; conduits, cables, bonds, tools, wires, switches, insulators, insulating materials, lightning arresters, circuit breakers, rheostats, and complete switchboards, etc.

GROUP 68.

ELECTRO-CHEMISTRY.

- Class 434. Primary batteries. Accumulators.
- Class 435. Electrolytic appliances and processes. Reduction of ores. Electroplating. Electrotyping.
- Class 436. Electro-thermic appliances and processes. Production and refining of metals or alloys.
- Class 437. Application to industrial chemistry; bleaching; disinfection of sewerage water; manufacture of soda, chlorine, chlorate of potash, etc.

GROUP 69.

ELECTRIC LIGHTING.

- Class 438. Use of continuous or alternating currents. Arc lamps. Regulators. Carbons for lamps. Incandescent lamps. Other forms of lamps.
- Class 439. Complete installations. Factories, public buildings, dwelling houses, central stations, etc.
- Class 440. Application to lighthouses, navigation, military service, public works, etc.
- Class 441. Photometry. Apparatus for determining the intensity, the distribution and illuminating power of light.
- Class 442. Electric appliances. Apparatus for safety and regulation; conduits, junction boxes, switches, lamp cords and interior wires, cabinets, cut-outs, time and automatic devices, sockets, fixtures, etc.

GROUP 70.

TELEGRAPHY AND TELEPHONY.

- Class 443. Telegraphic instruments, transmitters and receivers. Recording apparatus, multiplex apparatus, synchronous apparatus, wireless apparatus, electrographs, etc.
- Class 444. Telephones, transmitting and receiving apparatus, instruments, switchboards, ringing generators, pole changers, etc., and complete exchanges.
- Class 445. Telegraph and telephone wires and cables. Overhead, subterranean and submarine construction; materials and appliances.

GROUP 71.

VARIOUS APPLICATIONS OF ELECTRICITY.

- Class 446. Scientific apparatus, induction coils, static machines, X-ray apparatus, galvanometers, measuring apparatus, etc. Laboratory standards. Indicators and recording apparatus for natural phenomena.
- Class 447. Electricity as applied in therapeutics, surgery and dentistry.
- Class 448. Electrical signals. Application of electricity to railways, mines, public works and buildings. Thermostats, clocks, annunciators, chronographs, alarms. Electric sign mechanism, etc.
- Class 449. Methods of measurement. Instruments; indicating, recording and integrating.
- Class 450. Apparatus for heating by electricity. Cooking apparatus, furnaces, high temperature ovens. Electric welding.
- Class 451. Progress and development in electrical science and invention. Historical and statistical exhibits. Instruments, machines, models, drawings and publications.

Department F—Electricity.

UNITED STATES.

Machines for Generating and Using Electricity.

GROUP 67.

MACHINES FOR GENERATING AND USING ELECTRICITY.

- | Dept. No. | Location. |
|-----------|---|
| 208. | Allen & Bradley, Chicago, Ill.
Electric motor controllers. Block 23, Aisle Z. |
| 87. | American Carbon and Battery Co., St. Louis, Mo.
Motor and generator brushes. Block 36, Aisle G. |
| 207. | American Conduit Co., Chicago, Ill.
Bituminized fibre conduits. Court. |
| 262. | American Engine Co., Bound Brook, N. J.
Generator and switchboard. (Installed in Palace of Machinery. Block 49, Aisle II.) |
| 242. | American Steel and Wire Co., Chicago, Ill.
Trolley wire and bonds. In service on electric railway test track. |
| 209. | American Transformer Co., Newark, N. J.
Alternating current transformers. Block 17, Center. |
| 92. | Arnold, B. J., Chicago, Ill., Alternating current electric railway system. Operating electric car equipment, electric railway test track. |
| 97. | Browning Co., The, Milwaukee, Wis.
Direct current motors and generators. Working exhibit. Block 8, Aisles B. & V. |
| 10. | Bullock Electric Mfg. Co., Cincinnati, Ohio.
Direct and alternating current machinery, turbo-generators, transformers. Working exhibit. Block 15, Aisles B, V and X. (Generators and switchboards installed in Palace of Machinery, Block 36, Aisle E, 6 and 7 and Block 49, Aisles H and I), operating electric car equipment, electric railway test track. |
| 47. | Burdett-Rowntree Mfg. Co., Chicago, Ill.
Electric dumb waiters. Working exhibit. Block 3, Aisle A. |
| 178. | Burkins, Eugene, St. Louis, Mo.
Electric control for automatic machine gun. Block 12, Aisle V. |
| 77. | Burnham, Williams & Company, Philadelphia, Pa.
Electric locomotives for surface and mine haulage, and electric motor trucks. Working exhibit. Block 3, Aisles B and S. |
| 79. | Camp, H. B., Company, Chicago, Ill.
Vitrified clay conduits for underground wires. Court. |
| 7. | Clark, J., Jr., & Co., Louisville, Ky.
Dynamos, motors and application of electric control to machine tools. Working exhibit. Block 20, Aisle Z. |
| 111. | Commercial Electric Co., Indianapolis, Ind.
Dynamos and motors. Working exhibit. Block 14, Aisles B & W. |
| 237. | Crocker-Wheeler Co., Ampere, N. J.
Generators. (Installed in Palace of Machinery, Blocks 42-45, Aisles E, G, 7 and 8.) |
| 36. | Dayton Electric Mfg. Co., Dayton, Ohio.
Dynamo gas engine igniters, magnetic gas engine igniters, alternating gas engine igniters; cable for ignition apparatus. Working exhibit. Block 5, Aisle A. |
| 210. | Denver Engineering Works Co., Denver, Col.
Application of electric motor to portable rock drill. Working exhibit. Block 28, center. |
| 211. | Diehl Mfg., Co., Elizabeth, N. J.
Generators and electric motors applied to sewing machines. (Installed in Palace of Machinery, Block 34, Aisles D and 6; also in Palace of Manufactures.) |

Machines for Generating and Using Electricity.

- | Dept. No. | Location. | Dept. No. | Location. |
|---|--|-----------|--|
| 68. | Dresser, S. R., Bradford, Pa. Insulating couplings, sleeves, tees, crosses, ells, etc., to prevent electrolysis. Court. | 14. | General Electric Co., Schenectady, N. Y. Dynamos, motors, motor generators, transformers, rotary converters, electric motors for railways and roadways, methods of control of cars and trains, applications and methods for distribution of electric energy. Working exhibit. Block 28, Aisles F, G, V and Y. (Turbo-generator set and switchboard installed in Palace of Machinery, Block 44, Aisles 10, E and G.) Operating electric car equipment, electric railway test track. |
| 212. | Edison Mfg., Co., Orange, N. J. Electric battery fans. Block 27, Aisle F. | 149. | Gest, G. M., Cincinnati, O. Conduit system for underground wires. Court. |
| 28. | Electric Controller & Supply Co., Cleveland, O. Controllers for all services; magnetic reversing clutches, magnetic friction and stop brakes, switches, crane fittings, solenoids, resistance units and lifting magnets. Block 5, Aisle A. | 215. | Goldsborough, W. E., Lafayette, Ind. Electro-dynamometer. Working exhibit. Block 25, Aisle Z. |
| <p>This company acts as consulting engineer and manufactures the above mentioned devices. Especial attention is directed to the exhibit of rapid reversing motor, metal planer drive, lifting magnet, magnetic friction brake and cushion type solenoid, all of which may be seen under working conditions.</p> | | 42. | Gould Storage Battery Co., Depew, N. Y. Booster systems, storage battery installations. Working exhibit. Block 16, Aisle A. |
| 127. | Electric Railway Equipment Co., Cincinnati, O. Electric railway overhead material, poles and insulators. Block 8, Aisle B. Boulevard trolley pole construction on electric railway test track. | 138. | Hunt, C. W., Co., West New Brighton, New York. Electric storage battery locomotives for industrial railways; electric control for hoists. Working exhibit. Court. Block 6, Aisle A. |
| 43. | Electric Storage Battery Co., Philadelphia, Pa. Boosters and switchboards for controlling and regulating storage batteries. Block 20, Aisle Z. | 205. | India Rubber and Gutta Percha Insulating Co., Yonkers, N. Y. Wires and lead-covered cables. Block 17, Center. |
| 213. | Electros Co., Brooklyn, N. Y. Railway overhead material. Block 17, center. | 29. | Jandus Electric Co., Cleveland, O. Electric fans. Working exhibit. Block 14, Aisle W. |
| 88. | Eureka Tempered Copper Works, North East, Pa. Copper and brass products. Block 19, Aisle Y. | 98. | Kaestner, Charles, & Co., Chicago, Ill. Electric control for elevator. Working exhibit. Block 1, Center. |
| 257. | Fairbanks, Morse & Co., Chicago, Ill. Motors and dynamos for direct current, motor generators. Working exhibit. (Installed in Palace of Machinery, Blocks 34 and 43, Aisles B, E, 8 and 10.) | 20. | Kester Electric Mfg. Co., Chicago, Ill. Solder, soldering salts and paste. Block 39, Aisle S. |
| 48. | Field, C. J., New York City, N. Y. Glazed clay conduits. Court. | 202. | Keystone Electric Co., Erie, Pa. Direct current generators and motors. Working exhibit. Block 10, Aisle V. (Generator installed in Palace of Agriculture, Block 54.) |
| 23. | Fort Wayne Electric Works, Fort Wayne, Ind. Generators and motors for direct and alternating current. Working exhibit. Block 9, Aisles B and U. (Generator and switchboard installed in Palace of Machinery, Block 44, Aisle 8.) | 26. | Lincoln Electric Co., Cleveland, O. Dynamos, motor generators and electric brakes, etc. Working exhibit. Block 2, Aisle C. |
| 21. | Gardner Electric Drill & Machinery Co., Cleveland, O. Electric rock drill. Working exhibit. Block 8, Center. | 132. | Locke Insulator Mfg. Co., Victor, N. Y. High voltage transmission line insulations, porcelain and glass. Block 8, Center. |

Machines for Generating and Using Electricity.

- | Dept. No. | Location. | Dept. No. | Location. |
|-----------|---|-----------|--|
| 82. | McRoy Clay Works, Brazil, Ind. Vitrified clay conduits. Block 3, Aisles B and T. | 263. | Organ Power Company, Hartford, Conn. Device for controlling the speed of electric motors; working exhibit. Block 9, Aisle B. |
| 258. | Minerallac Co., Chicago, Ill. Speed limit and reverse current protective devices for rotaries and motor-generators: insulating compound. (Installed in Palace of Machinery, Blocks 36 and 53.) | 261. | Otis Elevator Co., New York City. Magnet control for elevator. Working exhibit. (Installed in Palace of Machinery, Block 5.) |
| | Rapid action voltmeter switch, high tension insulating compound and materials. Electroscopes for detecting dangerous potentials on cables and apparatus. Emergency cases for first aid to injured. | 45. | Pawling & Harnischfeger, Milwaukee, Wis. Electric control for traveling cranes, hoists and trolleys. Working exhibit. Crane Runway and Block 14, Aisles A and B. (Palace of Machinery, Central Bay.) |
| 129. | Moloney Electric Co., St. Louis, Mo. Alternating current transformers. Working exhibit. Block 8, Aisle A. | 125. | Peerless Electric Co., Warren, O. Dynamos, motors, fan motors, transformers. Working exhibit. Block 8, Aisle B. |
| 241. | Morgan Electric Machine Co., East Chicago, Ind. Electric third rail haulage system. (Installed in Mining Gulch.) | 108. | Robbins & Myers Company, The, Springfield, Ohio. Electric generators, motors, ceiling and desk fans. Working exhibit. Block 19, Aisle Y. |
| 12. | National Carbon Co., Cleveland, O. Motor and generator brushes, carbon contacts. Block 39, Aisle G. | 53. | Roth Bros. & Co., Chicago, Ill. Motor, dynamos, motor generators. Working exhibit. Block 19, Aisle Z. |
| 3. | National Electric Company, Milwaukee, Wis. Electrical machinery. Working exhibit. Block 6, Aisles A, B, and V. (Generator and switchboard installed in Palace of Machinery, Block 46, Aisles G, H, I and to, and Palace of Transportation, Aisle C, Post 27; and Palace of Agriculture, Block 51, and Mining Gulch.) | 19. | Safety Insulated Wire and Cable Co., New York. Wire, lead-covered armoured cables. Block 20, Aisle Z. |
| | Christensen air brakes are standard of the world for electric railways. 300 cars Buffalo Ry. used these air brakes during Pan-American Expo. All cars, Intramural Ry. La. Purchase Expo., equipped with them. America uses 10,000. Europe, Asia, Australia and Africa use 2,000. Alternating and direct current electrical machinery capacities up to 1,500 K. W. | 259. | Shaw Electric Crane Co., Muskegon, Mich. Motors and electric control for traveling crane. Working exhibit. (Installed in Palace of Machinery, Crane runway, Central Bay.) |
| 91. | Northern Electrical Mfg. Co., Madison, Wis. Direct current motors and dynamos. Working exhibit. Block 14, Aisles A, B and V. (Generator and exciter set installed in Palace of Machinery.) | 5. | Shedd Electric & Mfg. Co., New York, N. Y. Electric fans and bases, exhaust fans, electric motors. Working exhibit. Block 6, Aisles A and T. |
| | Machine tool equipments, variable speed, single voltage motors; electric mining equipments, electric rock drills and hammers and other electrical equipments. | 83. | Standard Underground Cable Co., Pittsburg, Pa. Wire, lead-covered cables. Block 3, Aisles A and T. |
| 240. | Ohio Brass Co., Mansfield, O. Electric railway bonds and supplies. (Installed in Mining Gulch.) | 264. | Stanley Electric Mfg. Co., Pittsfield, Mass. (Generator and switchboard installed in Palace of Machinery, Block 52, Aisles G and H.) |
| | | 113. | Sterling Electric Motor Co., Dayton, Ohio. Motors. Working exhibit. Block 14, Aisle W. |
| | | 86. | Thordarson, C. H., Chicago. High-tension transformers, electric motors, and special electro-magnetic appliances; working exhibit. Block 5, Aisle A. |
| | | 126. | Triumph Electric Co., Cincinnati, O. Generators and motors. Working exhibit. Block 8, Aisles A, B and U. |

Machines for Generating and Using Electricity—Electro-Chemistry.

Dept. No. Location.

72. **Wagner Electric Mfg. Co., St. Louis, Mo.** Alternating and direct current motors, generators, static transformers, switchboards and specialties. Working exhibit. Block 9, Aisles B and V. (Exciter set installed in Palace of Machinery, Block 49, Aisle 11.)

Electrical engineers and central station men are cordially invited to make our general offices, 2013-21 Locust street, their headquarters and have their mail addressed in our care while in the city. Ample facilities will be provided for the discharge of any business you may have; we will also take pleasure in acquainting you fully with our various lines.

239. **Walker Electric Co., Philadelphia, Pa.** Switchboard. (Installed in Palace of Machinery.)

196. **Warren Electric Mfg. Co., Sandusky, O.** Alternators, direct-connected. Working exhibit. Block 8, Aisle A. (Generator installed in Palace of Machinery. Block 49, Aisle 11.)

85. **Wesco Supply Co., The, St. Louis, Mo.** Secondary generator for annunciator work. Working exhibit. Block 8, Aisles A, B, U and V.

17. **Western Electric Co., Chicago, Ill.** Dynamos, motors, transformers, compensators, circuit-breakers and switchboards. Working exhibit. Block 17, Aisles A, B and W. (Generator installed in Steam, Gas and Fuels Bldg.)

25. **Westinghouse Electric & Mfg. Co., Pittsburg, Pa.** Generators, rotary converters, motors, transformers, switchboards and accessories. Working exhibit. Block 4, Aisles B, S and T. Block 7, Aisles B, T & U. Operating electric car equipment, electric railway test track. (Generators, switchboards, and storage battery locomotive installed in Palace of Machinery. Blocks 47-51, Aisle 10.)

66. **Wyckoff Pipe & Creosoting Co., Stamford, Conn.** Conduits, poles, cross arms, cross ties. Court.

251. **Young, Homer, Co., The, Toledo, O.** Motors for sewing machines. (Installed in Palace of Manufactures, Block 24B, 11th and B streets.)

GROUP 68.

ELECTRO-CHEMISTRY.

Dept. No. Location.

253. **Acker Process Co., Niagara Falls, N. Y.** Caustic soda and bleaching powder, manufactured electrolytically. (Installed in Palace of Mines and Metallurgy. Block 11, Aisles A and B.)

87. **American Carbon & Battery Co., St. Louis, Mo.** Primary batteries. Block 36, Aisle G.

135. **American Electric Novelty & Mfg. Co., New York City.** Primary batteries. Block 19, Aisles B and Y.

216. **Batteries Supply Co., Newark, N. J.** Gladstone-Lelande primary batteries. Block 17, Center.

243. **Carborundum Co., The, Niagara Falls, N. Y.** Carborundum made in electric furnace. (Installed in Palace of Mines and Metallurgy. Block 11, Aisles A and B, also Palace of Machinery.)

252. **Castener Electrolytic Alkali Co., Niagara Falls, N. Y.** Caustic soda and bleaching powder, manufactured electrolytically. (Installed in Palace of Mines and Metallurgy, Block 11, Aisles A and B.)

36. **Dayton Electric Manufacturing Co., Dayton, Ohio.** Primary batteries and accumulators. Block 5, Aisle A.

101. **Edison Storage Battery Co. Orange, N. J.** Storage battery. Working exhibit. Block 27, Aisles F and V.

41. **Electra Water Purifier Co., St. Louis, Mo.** Electric water purifiers. Working exhibit. Court.

51. **Electric Contract Company, New York City.** Batteries, specialties. Working exhibit. Block 39, Aisle S.

43. **Electric Storage Battery Co., Philadelphia, Pa.** Storage batteries, controlling and regulating apparatus. Working exhibit. Block 20, Aisles D and Z.

42. **Gould Storage Battery Co., New York, N. Y.** Storage batteries, booster systems. Working exhibit. Block 16, Aisle A.

24. **Hall Gold and Silver Plating Works, Chicago.** Electro-plating machinery and accessories. Working exhibit. Block 10, Aisle V.

Electro-Chemistry—Electric Lighting.

- | Dept. No. | Location. | Dept. No. | Location. |
|---|---|---------------------------|---|
| 151. | Howard Electric Novelty Company, New York. Batteries; working exhibit. Block 4, Aisles C. and T. | 85. | Wesco Supply Co., The, St. Louis, Mo., Primary batteries. Block 8, Aisles A, B, U and V. |
| 205. | India Rubber and Gutta Percha Insulating Co., Yonkers, N. Y. Rubber-covered cables. Block 17, Center. | 17. | Western Electric Co., Chicago, Ill. Primary batteries. Block 17, Aisles A, B and W. |
| 46. | International Acheson Graphite Co., Niagara Falls, N. Y. Graphite and graphite electrodes. Head of Aisle S. (Also installed in Palace of Mines and Metallurgy, Block 11, Aisles A and B.) | GROUP 69. | |
| Acheson graphite is made in the electric furnace. Its purity, uniformity and inert properties are guaranteed. Especially valuable for use as the pigment in protective coatings for structural iron and steel. The electrodes have been adopted as standards. Awarded Grand Prix, Paris, 1900; Gold Medals, Omaha, 1899; Buffalo, 1901; and Charleston, 1902. | | ELECTRIC LIGHTING. | |
| 103. | Leclanche Battery Co., New York, N. Y. Primary batteries. Court. | 131. | Adams-Bagnall Electric Co., Cleveland, Ohio. Direct and alternating current arc lamps. Working exhibit. Block 8, Aisle A. |
| 12. | National Carbon Co., Cleveland, O. Primary batteries, electrodes. Block 36, Aisle G. | 87. | American Carbon and Battery Co., St. Louis, Mo. Arc lamp carbons. Block 36, Aisle G. |
| 244. | Niagara Electro-chemical Co., Niagara Falls, N. Y. Peroxide of sodium and metallic sodium, manufactured by electric process. (Installed in Palace of Mines and Metallurgy, Block 11, Aisles A and B.) | 115. | American Circular Loom Co., Chelsea, Mass. Conduit. Block 14, Aisle W. |
| 16. | Norton Emery Wheel Co., Worcester, Mass. Alundum as produced by electric furnace. Block 36, Aisle G. | 207. | American Conduit Co., Chicago, Ill. Bituminized fiber conduits for lighting mains. Court. |
| 254. | Pittsburg Reduction Co., Niagara Falls, N. Y. Aluminum reduced by electric process. (Installed in Palace of Mines and Metallurgy, Block 11, Aisles A and B.) | 135. | American Electric Novelty and Mfg. Co., New York City. Portable electric lamps. Working exhibit. Block 19, Aisles B & Y. |
| 19. | Safety Insulated Wire and Cable Co., New York City. Wires and cables. Block 20, Aisle Z. | 217. | American Miniature and Decorative Lamp Co., New York. Miniature and decorative lamps. Working exhibit. Block 19, Aisles B and Y. |
| 255. | Siloxicon Co., The, Niagara Falls, N. Y. Siloxicon products manufactured in electric furnace. (Installed in Palace of Mines and Metallurgy, Block 11, Aisles A and B.) | 218. | Ballou-Hutchins Electric Co., Providence, R. I. Automatic time switches. Block 17, Center. |
| 83. | Standard Underground Cable Co., Pittsburg, Pa. Rubber-covered wires and cables. Block 3, Aisles A and T. | 123. | Benjamin Electric Mfg. Co., New York City. Wireless clusters, window and weather proof sockets. Working exhibit. Block 25, Aisle G. |
| 256. | Union Carbide Co., Niagara Falls, N. Y. Calcium carbide, a by-product of the electric furnace. (Installed in Palace of Mines and Metallurgy, Block 11, Aisles A and B.) | 188. | Bryant Electric Co., Bridgeport, Conn. Lamp sockets, rosettes, branch blocks, fuses, switches and electrical fittings. Working exhibit. Block 7, Aisle T. |
| | | 10. | Bullock Electric Mfg. Co., Cincinnati, O. Multiple voltage systems, switchboards. Working exhibit. Block 15, Aisles B, V and X. |
| | | 148. | Cassidy & Son Mfg. Co., New York City. Electric light fixtures. Working exhibit. Block 25, Aisles F, G and Y. |
| | | 153. | Chicago Fuse Wire & Mfg. Co., Chicago. Fuse links and wire. Court. |

Electric Lighting.

- | Dept. No. | Location. | Dept. No. | Location. |
|-----------|--|-----------|---|
| 187. | Cooper-Hewitt Electric Co., New York City. Hewitt mercury vapor lamps, converters, circuit breakers. Working exhibit. Block 7, Aisles B, T and U. (Also installed in Palace of Machinery, Blocks 47-51, Aisle 10.) | 73. | Gould Coupler Co., New York City. Complete electric light equipment for railroad cars. Working exhibit. Block 16, Aisle A. |
| 219. | D. & W. Fuse Co., Providence, R. I. Encased fuses and cut out cabinets. Block 17, Center. | 32. | Holmes, Booth & Haydens Co., New York City. Electric fixtures. Working exhibit. Block 25, Aisles F, G and Y. |
| 220. | Dale Co., New York. Electric light reflectors and fixtures. Block 17, Center. | 52. | Holophane Glass Co., New York City. Glass globes and reflectors. Working exhibit. Block 25, Aisles F, G and Y.
Highest awards Antwerp, Paris, Buffalo. |
| 36. | Dayton Electric Mfg. Co., Dayton, O. Lighting apparatus for automobiles. Working exhibit. Block 5, Aisle A. | 151. | Howard Electric Novelty Company, New York. Portable electric lights; working exhibit. Block 4, Aisles C and T. |
| 144. | Dicke Tool Co., Downer's Grove, Ill. Linemen's construction tools. Block 5, Aisle A. | 193. | Illuminating Appliance Co., New York City. Glass reflectors. Working exhibit. Block 25, Aisles F, G and Y. |
| 75. | Economical Electric Lamp Co., New York City. Incandescent lamps. Working exhibit. Block 39, Aisle S. | 205. | India Rubber and Gutta Percha Insulating Co., Yonkers, N. Y. Wires and cables. Block 17, Center. |
| 127. | Electric Railway Equipment Co., Cincinnati, O. Electric lighting poles and apparatus. Block 8, Aisle B. | 29. | Jandus Electric Co., Cleveland, O. Arc lamps and electric fans. Working exhibit. Block 14, Aisle W. |
| 43. | Electric Storage Battery Co., Philadelphia, Pa. Model central station storage battery installation. Working exhibit. Block 23, Aisles D and Z. | 168. | Johns-Manville Co., H. W., New York. Enclosed fuse devices. Block 8, Center. |
| 63. | Federal Electric Co., Chicago, Ill. Clamp sockets, porcelainized steel reflectors. Working exhibit. Block 36, Aisle G. | 8. | Kellog Switchboard and Supply Co., Chicago, Ill. Miniature incandescent lamps for telephone switchboards. Working exhibit. Block 24, Aisles F and Z. |
| 23. | Fort Wayne Electric Works, Ft. Wayne, Ind. Arc lamps and regulators, etc. Working exhibit. Block 9, Aisles B and U. | 197. | Keystone Blue Paper Co., Philadelphia, Pa. Application of electric light to blue printing apparatus. Working exhibit. Block 21, Aisle D. |
| 14. | General Electric Co., Schenectady, N. Y. Arc and incandescent lamps, mercury vapor lamps, various electric lighting systems, central station equipment, application to navigation, photometry, electric appliances. Working exhibit. Block 28, Aisles F, G, V and Y. | 265. | Lansing, R. V., Co., Chicago. Special fixtures for scientific lighting. Working exhibit. Block 25, Aisles F, G and Y. |
| 149. | Gest, G. M., Cincinnati, O. Conduit exhibit. Court. | 26. | Lincoln Electric Company, Cleveland, O. Arc lamps. Working exhibit. Block 2, Aisle C. |
| 14. | Gibson Gas Fixture Works, Philadelphia, Pa. Electric fixtures. Block 7, Center. | 33. | Lionel Mfg. Co., New York, N. Y. Electrical novelties and toys. Working exhibit. Block 14, Aisle W. |
| 172. | Globe Electric Mfg. Co., Cleveland, O. Arc and incandescent railway headlights. Block 8, Center. | 184. | Marshall-Sanders Company, Boston, Mass. Sockets, switches, receptacles, cut-outs and attachment plugs. Working exhibit. Block 8, Center. |
| | | 173. | Matthews, C. P., LaFayette, Ind. Photometers. Working exhibit. Block 25, Aisle Z. |

Electric Lighting—Telegraphy and Telephony.

- | Dert. No. | Location. |
|-----------|--|
| 130. | Matthews, W. N. & Bro., St. Louis, Mo. Guy anchors. Block 8, Center. |
| 6. | Morris & Paltridge, Chicago, Ill. Electric shade hoist and electric opaque projector. Block 11, Aisle V. |
| 12. | National Carbon Co., Cleveland, O. Carbons for lamps. Block 36, Aisle G. |
| 191. | Nernst Lamp Co., Pittsburg, Pa. Lamps and accessories. Working exhibit. Block 7, Aisle T. |
| 91. | Northern Electric Mfg. Co., Madison, Wis. Motor-generators for lighting systems. Block 14, Aisles A, B and V. |
| 181. | Osburn Flexible Conduit Co., New York. Conduits. Block 8, Center. |
| 190. | Perkins Electric Switch Mfg. Co., Bridgeport, Conn. Switches. Working exhibit. Block 7, Aisle T. |
| 164. | Phelps Company, The, Detroit, Mich. Turn-down and winking electric lamps and specialties; working exhibit. Block 16, Aisle A. |
| 183. | Pittsburg Blue Printing Company, Pittsburg, Pa. Application of electric light to blue printing apparatus; working exhibit. Block 36, Aisle G, and Block 9, Center. |
| 40. | St. Louis Brass Mfg. Co., St. Louis, Mo. Electric fixtures. Block 21, Aisle D. |
| 266. | Saftey Car Heating and Lighting Co., New York. Electric lighting fixtures for cars. (Installed in Transportation, Post 63, Aisle E, also Post 89, Aisles H, F and 3.) |
| 19. | Safety Insulated Wire & Cable Co., New York City. Interior wires and cables. Block 20, Aisle Z. |
| 189. | Sawyer-Man Electric Co., New York City. Standard and ornamental incandescent electric lamps. Block 7, Aisle T. (Palace of Machinery, Blocks 47-51, Aisle 10.) |
| 83. | Standard Underground Cable Co., Pittsburg, Pa. Weatherproof wires and lead covered cables. Block 3, Aisles A and T. |
| 57. | Stilz, W. F. & Co., Philadelphia, Pa. Incandescent lamp socket. Block 25, Aisles F and Z. |

- | Dert. No. | Location. |
|-----------|--|
| 206. | Sunbeam Incandescent Lamp Co., Chicago, Ill. Incandescent lamps. Block 17, Center. |
| 222. | Tea Tray Co., Newark, N. J. Reflectors, shade and street lighting fixtures. Block 17, Center. |
| 203. | Thomas, R., & Son, East Liverpool, O. Porcelain knobs and insulators. Block 17, Center. |
| 89. | Toerring, C. J. Co., Philadelphia, Pa. Arc lamps. Working exhibit. Block 21, Aisle D. |
| 163. | United States Incandescent Lamp Company, St. Louis. Incandescent electric lamps and incandescent electric lamp factory. Working exhibit. Block 18, Aisles B, X and Y. |
| 128. | Warren Electric & Specialty Co., Warren, Ohio. Incandescent lamps. Block 8, Aisle B. |
| 17. | Western Electric Company, Chicago, Ill. Arc cabinets and cut-outs. Working exhibit. Block 17, Aisles A, B and W. |
| 25. | Westinghouse Electric & Mfg. Co., Pittsburg, Pa. Arc lamps, switches and circuit breakers. Working exhibit. Block 7, Aisles B, T and U. |

GROUP 70.

TELEGRAPHY AND TELEPHONY.

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| 87. | American Carbon and Battery Co., St. Louis, Mo. Back plates, diaphragms, lightning arresters, transmitter carbons. Block 36, Aisle G. |
| 207. | American Conduit Co., Chicago, Ill. Bituminized fibre conduits for telephones. Court. |
| 35. | American DeForest Wireless Telegraph Co., New York, N. Y. Marine and land wireless telegraphy. Working exhibit. Block 19, Aisles B and Z. Block 37, Aisles D and T. Wireless telegraph station tower. (Installed in Model City. Also in U. S. Government Bldg.) |

Over thirty stations now in operation in the United States, including those operated by the Government. Ten stations on World's Fair Grounds, including steel tower 300 feet high at Parade Entrance, and operating model of Seattle station in Electricity Palace. Executive offices, 100 Broadway, New York. Western Office, 520 Olive St., St. Louis.

Telegraphy and Telephony.

- | Dept. No. | Location. | Dept. No. | Location. |
|-----------|---|-----------|--|
| 141. | American Electric Fuse Co., Chicago, Ill. Telephone protective apparatus, selective signaling, etc. Block 23, Aisle Z. | 99. | Gray Telephone Pay Station Co., Hartford, Conn. Telephone pay stations. Working exhibit. Block 19, Aisle Z. |
| 224. | American Marconi Wireless Telegraph Co., New York. Wireless telegraph apparatus. Working exhibit. Block 38, Aisles D and T. | 145. | Hutchison, Miller Reese, New York City. Wireless telephone system. Block 21, Aisle D. Also Court. |
| 22. | American Telephone & Telegraph Co., Boston, Mass. Automatic and private branch exchanges; radiophone, Working exhibit. Block 17, Aisles A, B and Z. | | Around the Court of the Electricity Building is a circuit of wires connected to a booth in Block 21. Before a telephone transmitter in the booth music will be played. In the Court no sound of this is heard until a pocket telephone receiver without any wire connection is placed to the ear, when the music becomes audible. Everyone should hear it. |
| 116. | Armstrong, Martin, St. Louis. Telegraphic transmitter for teaching telegraphy; working exhibit. Block 21, Aisle D. | 205. | India Rubber and Gutta Percha Insulating Co., Yonkers, N. Y. Telephone wires and cables. Block 17, Center. |
| 74. | Automatic Electric Co., Chicago, Ill. Telephones and switchboards. Working exhibit. Block 24, Aisles F and Y. | 8. | Kellogg Switchboard & Supply Co., Chicago, Ill. Telephone switchboards, telephones, wire, telephone cables, poles, supplies. Working exhibit. Block 24, Aisles F, D, Y and Z. |
| 154. | Baird Manufacturing Co., Chicago. Telephone pay stations, meters, and specialties; working exhibit. Block 23, Aisle Z. | | Gold medal for telephone systems and apparatus at Pan-American Exposition, Buffalo, 1901. |
| 71. | Central Telephone & Electric Co., St. Louis, Mo. Telephone apparatus, magnets, etc. Working exhibit. Block 23, Aisle Z. | 34. | Kusel, D. A., Telephone & Electric Mfg. Co., St. Louis, Mo. Telephones, switchboards and telephone supplies. Working exhibit. Block 23, Aisle Z. |
| 153. | Chicago Fuse Wire & Mfg. Co., Chicago. Telephone safety appliances, Court. | 12. | National Carbon Co., Cleveland, O. Back plates, diaphragms, lightning arresters, transmitter carbon. Block 36, Aisle G. |
| 118. | Controller Company of, America, St. Louis, Mo. Devices for measuring telephone service. Working exhibit. Block 19, Aisles D and Z. | 150. | Phillips, Walter P., Bridgeport, Conn. Telegraphic apparatus. Working exhibit. Block 1, Aisle S. |
| 200. | Cook, Frank B., Chicago, Ill. Telephone distributing board, protective apparatus and telephone accessories. Working exhibit. Block 24, Aisle D. | | A paper tape is embossed by a recording machine from hand sending, sent over a line at a high rate of speed, recorded on another paper tape at the other end and then distributed to operators who read it by sound as it is mechanically reproduced for them. Very simple and accurate. Particulars may be had at the booth. |
| 93. | Delany, Patrick B., South Orange, N. J. Telegraphy, keyboard transmitters and perforators. Working exhibit. Block 1, Aisle S. | 30. | Postal Telegraph-Cable Co., New York, N. Y. Telegraph instruments, switchboards, etc. Working exhibit. Block 1, Aisle S. |
| 223. | Electric Novelty and Talking Machine Co., Bridgeport, Conn. Telegraph instruments. Block 1, Aisle S. | 53. | Roth Bros. & Co., Chicago, Ill. Telephone ringing generators. Working exhibit. Block 19, Aisle Z. |
| 37. | Faller Automatic Telephone Exchange Co., New York City. Automatic and semi-automatic telephone exchanges. Working exhibit. Block 24, Aisle Y. | | |
| 4. | Gray National Telautograph Co., New York City. Telautograph. Working exhibit. Block 1, Aisle S. (Also in U. S. Government Bldg.) | | |

Various Applications of Electricity.

- | Dept. No. | Location. |
|---|--|
| 19. | Safety Insulated Wire & Cable Co., New York, N. Y. Telegraph and telephone wires and cables. Block 20, Aisle Z. |
| 83. | Standard Underground Cable Co., Pittsburg, Pa. Telegraph and telephone wires and cables. Block 3, Aisles A and T. |
| 9. | Sumter Telephone Mfg. Co., Sumter, S. C. Telephones; switchboards; specialties. Block 14, Aisles A and W. |
| 104. | Telephone Hygienic Company, Los Angeles, Cal. Telephone transmitter; hygienic appliances. Working exhibit. Block 19, Aisle Y. |
| You talk against a clean surface. Appliance antiseptic, chemically pure. Prevents odors, bacteria and dust in mouth-piece of transmitter. Materially assists transmission of sound wave. Stops depreciation of transmitter by excluding moisture. | |
| 267. | Telephonine Co., New York. Antiseptic telephone attachment. (Installed in Palace of Liberal Arts, Block 56A, Aisle 9.) |
| 225. | United Electrical Mfg. Co., New York. Telegraph instruments. Block 1, Aisle S. |
| 85. | Wesco Supply Co., The, St. Louis, Mo. Local and long-distance telephone apparatus. Block 8, Center. |
| 17. | Western Electric Co., Chicago, Ill. Telephones, switchboards, cables and telephone supplies. Block 17, Aisles A, B and W. |
| 133. | Western Union Telegraph Co., New York, N. Y. Telegraph instruments, switchboards, etc. Working exhibit. Block 1, Aisle S. |
| 65. | Yetman, Charles E., New York, N. Y. Transmitting typewriter. Working exhibit. Block 1, Aisle S. |

GROUP 71.

VARIOUS APPLICATIONS OF ELECTRICITY.

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|-----------|---|
| 94. | Aloe. A. S. & Co., St. Louis, Mo. Electric cautery converter. Working exhibit. Block 36, Aisle G. |
| 247. | American Concentrator Co., Joplin, Mo. Magnetic separators. (Installed in Palace of Mines and Metallurgy. Block 50, Aisles 1 and 4B corridor.) |
| Dept. No. | Location. |
| 62. | American Electric Heater Co., Detroit, Mich. Electric heating and cook- |

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| | ing apparatus. Working exhibit. Block 20, Aisle Z. |
| 226. | American Institute of Electrical Engineers. Electrical transactions. Block 27, Aisle F. |
| 49. | American School of Correspondence, Chicago, Ill. Students' work in electricity. Block 19, Aisle Y. |
| 22. | American Telephone and Telegraph Co., Boston. Historical exhibit of Bell telephones. Block 17, Aisles A, B and Z. |
| 84. | American Watchman's Time Detector Co., New York City. Time detectors, magneto system, battery system. Working exhibit. Block 19, Aisles D and Y. |
| 156. | American Watchman's Time Detector Company, Cleveland, Ohio. Electric watchman's time detectors, electric alarms. Working exhibit. Block 16, Aisle A. |
| 157. | Association of Edison Illuminating Companies, Chicago. Historical exhibit of Edisonia, and of Edison Illuminating Companies. Blocks 26 and 27, Aisles F, X and Y. |
| 185. | Atlanta Utility Works, East Point, Ga. Magnetic separators. Working exhibit. Block 19, Aisle Y. |
| 59. | Automatic Fire Alarm Company, New York City. Fire alarm systems. Working exhibit. Block 1, Aisle S. |
| 142. | Bajohr, Carl, St. Louis, Mo. Lighting apparatus. Block 36, Aisle G. |
| 195. | Bario Vacuum Company, New York City. Vacuum tubes. Working exhibit. Block 4, Aisle S. |
| 39. | Barlow, M. V., Chicago. Electric engraving pen. Working exhibit. Block 39, Aisle R. |
| 152. | Baumgart, Alexandria, N. Y. City. Application of electric control to automatic figures. Working exhibit. Block 39, Aisle R. |
| 270. | Bayno, Maurice, New York City. Electric cooker and broiler. Block 35, Aisle G. |
| Used at New York State Building, and leading hotels, clubs and families. Clean and quick; no dust or odors. Endorsed by physicians. Write or call regarding sale of patent rights or stock. M. Bayno, New York State Building. | |
| 64. | Bristol Company, The, Waterbury, Conn. Recording instruments for electricity. Working exhibit. Block 36, Aisles G and V. |

Various Applications of Electricity.

- | Dept. No. | Location. | Dept. No. | Location |
|-----------|---|--|--|
| 194. | Cassiers Magazine Co., N. Y. Books and periodicals. Block 1, Aisle S. | 63. | Federal Electric Co., Chicago, Ill. Electric signs. Block 36, Aisle G. |
| 198. | Chicago Roentgen X-Ray Laboratory, Chicago. Sciagraphs. Block 4, Aisle S. | 23. | Fort Wayne Electric Works, Ft. Wayne, Ind. Direct and alternating current instruments, wattmeters. Working exhibit. Block 9, Aisles B and U. |
| 245. | Cleveland Reversible Window Co., Cleveland, O. Electric burglar alarm. Block 6, Aisle T. | 14. | General Electric Company, Schenectady, N. Y. Electrical apparatus; electrical instruments; electrical heating and cooking apparatus. Historical exhibits. Working exhibit. Block 28, Aisles F, G, V and Y. |
| 36. | Dayton Electric Mfg. Co., Dayton, O. Induction coils; recorders. Working exhibit. Block 5, Aisle A. | 246. | Hammer, W. J., New York. Historical exhibit of incandescent lamps. Block 26, Aisle F. |
| 227. | Diamond Meter Company, Peoria, Illinois. Electric integrating and wattmeters; working exhibit. Block 8, Center. | 250. | Harmonic Health Association, St. Louis, Mo. Electro-harmonic vibrators. Block 21, Aisle D. |
| 121. | Dodd & Struthers, Des Moines, Ia. X-ray apparatus and lightning rods. Working exhibit. Block 39, Aisle S. | 76. | Heinze Electric Company, Lowell, Mass. Induction and high frequency coils, static machines, electro-therapeutic and X-ray accessories. Working exhibit. Block 4, Aisle T. |
| 212. | Edison Mfg. Co., Orange, N. J. Universal projecting kinoscope. Block 27, Aisles F and V. | 106. | Hinton & Tarkington, Hot Springs, Ark. Apparatus for the therapeutical application of electricity. Working exhibit. Block 4, Aisle T. |
| 228. | Edison, Thomas A., Orange, New Jersey. Exhibit of electrical inventions. Block 26, Aisle Y. | 175. | Humphrey, H. H., St. Louis, Mo. Plans, specifications and photographs of electric installations. Head of Aisle A. |
| 176. | Electric Candy Machine Co., Nashville, Tenn. Electric candy making machine. Working exhibit. Block 38, Aisle D. | 11. | Hutchison Acoustic Co., New York City. Instruments for the deaf. Block No. 23, Aisle Z. |
| 43. | Electric Storage Battery Co., Philadelphia. Storage batteries for signals, fire alarms, medical and laboratory purposes. Working exhibit. Block 20. | Exhibitions daily of deaf mutes being made to hear and taught to speak. Subjects furnished by and instruction under the supervision of the McCowen School for the Deaf of Chicago, Ill. Opportunity for the partially deaf to see and try the Acousticon and Massacon of which so much has been written. | |
| 229. | Electrical Review Publishing Co., New York. Electrical publications. Block 8, Center. | 268. | Indiana Novelty Company, Muncie, Indiana. Electric night light door plate. Working exhibit. Block 5, Aisle A. |
| 78. | Electrician Publishing Company, Chicago, Ill. Books and publications on electricity. Block 1, Aisles C and S. | 158. | King, H. E., Chicago. Enameling and dental furnaces. Working exhibit. Block 39, Aisle R. |
| 230. | Elred Manufacturing Co., Chicago, Ill. Electric cigar lighter. (Installed in Palace of Varied Industries. Block 3A, G street.) | 38. | Kny-Sheerer Company, New York City. X-ray apparatus, induction coils. Electricity in surgery and dentistry. Working exhibit. Block 4, Aisle S. |
| 114. | Empire Electric Instrument Co., New York, N. Y. Testing instruments. Block 14, Aisle W. | | |
| 174. | Esterline, J. W., LaFayette, Ind. Permeameters and special magnetic testing apparatus. Working exhibit. Block 25, Aisle Z. | | |

Various Applications of Electricity.

Dept. No.	Location.
232. Leeds & Northup Co., The, Philadelphia, Pa.	Electrical measuring instruments. Block 29, Aisle G.

Instruments of our manufacture will be found in the exhibit of the National Bureau of Standards, having been loaned for use during this Exposition, and at the proper time each day they may be seen by those interested. Fully illustrated, descriptive catalogue, with further information and prices, will be sent free. Address 259 N. Broad St.

119. McGraw Publishing Company, New York, N. Y. Electrical books and publications. Block 1, Aisle S.

94. Meyrowitz, E. B., New York. Electric ophthalmometers. Working exhibit. Block 36, Aisle G.

6. Morris & Paltridge, Chicago, Ill. Program clocks. Working exhibit. Block 11, Aisle V.

80. National Bureau of Standards, Washington, D. C. Electrical testing laboratory, showing methods, instruments and standards. Block 29, Aisles G, V and Z.

81. National Cash Register Co., Dayton, O. Electric cash registers and electric cash register systems. Working exhibit. Block 4, Aisle S.

Pioneer in register making with total output of 380,000 machines. Holds 931 patents covering 20,000 claims. Dayton factory utilizes 32 acres floor space; branch factories in Canada and Germany. Diplomas and highest awards from Chicago, Omaha, Paris, Buffalo and Charleston expositions where Nationals were adopted. Over 600 in use at this Fair.

170. National Clock Works, St. Louis. Electrically controlled valves, thermostats, secondary clocks, automatic fire alarm. Working exhibit. Block 21, Aisle D.

233. National Electric Light Association. Transactions. Block 27, Aisle F.

234. Negus, T. & J., New York. Electric chronometer. Block 29, Aisle G.

249. Pittsburg Steel Co., Pittsburg, Pa. Electrically welded wire fence intersections. (Installed in Mining Gulch.)

Dept. No.	Location.
60. Pneumatic Signal Company, New York City.	Signals for steam and electric railways. Working exhibit. Electric railway test track.

112. Prometheus Electric Co., New York City, N. Y. Electrical heating apparatus. Working exhibit. Block 14, Aisle W.

55. Purdue Electrical Research Laboratory, LaFayette, Ind. Special apparatus for electrical testing, with results of numerous investigations. Working exhibit. Block 25, Aisle Z.

199. Reynolds Electric Flasher Mfg. Co., Chicago, Ill. Electric sign mechanism. Working exhibit. Block 25, Aisles F, G and Y.

56. Scheidel & Company, Chicago, Ill. Induction coils, X-ray and high frequency apparatus. Working exhibit. Block 4, Aisle S.

5. Shedd Electric & Mfg. Co., New York City. Cautery transformers, dental motors, optician's drill. Working exhibit. Block 6, Aisles A and T.

235. Stanley Instrument Co., Great Barrington, Mass. Electric measuring instruments. Block 29, Aisle G.

236. Swett & Lewis, Boston, Mass. X-ray coil and electraviolet ray apparatus; working exhibit. Block 36, Aisle G.

67. Underwriters Laboratories, Chicago, Ill. Electrical burnouts found in practice. Block 31, Aisle V.

167. United States Electric Signal Co., West Newton, Mass. Electric signals for electric railways. Working exhibit. Block 39, Aisle R.

This Company is doing for single line trolley roads that which has been done on steam roads in saving lives, time and money, by using block signals. Their highway crossing signals automatically announce the approach of cars.

182. University of Mississippi, University, Mississippi. Static machine and condenser. Working exhibit. Block 4, Aisle T.

109. Van Inwagen, James, Momence, Ill. Electric clock. Working exhibit. Block 1, Aisle S.

100. Wagner, R. V. & Co., Chicago, Ill. Mica plate static machines, X-ray tubes and electrical instruments. Working exhibit. Block 4, Aisles S and T.

Various Applications of Electricity.

Dept. No.	Location.	Dept. No.	Location.
72.	Wagner Electric Mfg. Co., St. Louis, Mo. Switchboard indicating instruments. Working exhibit. Block 9, Aisles B and V.	25.	Westinghouse Electric & Mfg. Co., Pittsburg, Pa. Electrical measuring instruments. Working exhibit. Block 4, Aisles B, S and T. Block 7, Aisles B, T and U.
134.	Waite & Bartlett Mfg. Co., New York City. Electro therapeutic apparatus. Working exhibit. Block 4, Aisles C and S.	15.	Weston Electrical Instrument Co., Newark, N. J. Electrical measuring instruments, voltmeters, ammeters, wattmeters, etc., for portable station and laboratory uses. Block 25, Aisles G and Z.
179.	Warner Instrument Co., Beloit, Wis. Magnetic cut meter and autometer. Block 14, Aisle V.	248.	Wetherill Separating Co., New York City. Magnetic separator. (Installed in Palace of Mines and Metallurgy. Block 21, Aisles B and C.)
54.	Wasson, B. F., Clinton, Ill. Evolution of the Independent Telephone. Block 25, Aisle F.	180.	Whitney Electrical Instrument Co., Penacock, N. H. Electrical measuring and testing apparatus. Working exhibit. Block 8, Center.
17.	Western Electric Company, Chicago, Ill. Fire alarm apparatus. Working exhibit. Block 17, Aisles A, B and W.	238.	Willyoung & Gibson, New York City. Scientific electrical instruments; working exhibit. Block 29, Aisle G.
269.	Western X-Ray & Coil Co., Chicago, Ill. X-Ray coils, transformers and electrotherapeutic apparatus. Block 4, Aisles D and S.	122.	Windsor & Kenfield Publishing Co. Chicago, Ill. Electric railway publications. Block 1, Aisle C.

ARGENTINE.

Location:—Block 16, Aisle A.

Appliances for Using Electricity.

GROUP 67.

Argentine Department of Posts and Telegraphs, Buenos Ayres. Automatic lightning arrester and grounding device.

Compania La Teutonia, Buenos Ayres. Carbons for electric motors (Installed in the Palace of Manufactures.)

Martinez, Felix, I., Buenos Ayres. Charcoal for insulating purposes (Installed in the Palace of Manufactures.)

GROUP 68.

Compania La Teutonia, Buenos Ayres. Electrodes for electric furnaces. (Installed in the Palace of Manufactures.)

GROUP 69.

Argentine Department of Posts and Telegraphs, Buenos Ayres. Combined automatic lightning arrester and cut-out (Installed in Palace of Manufactures.)

Compania La Teutonia, Buenos Ayres. Carbons for arc lamps.

GROUP 70.

Argentine Department of Posts and Telegraphs, Buenos Ayres. Improved Morse instrument.

GROUP 71.

Argentine Department of Posts and Telegraphs, Buenos Ayres. Maps and diagrams showing the extension and the development of telegraphy and telephony in the Argentine Republic.

Azatetto Bros., Buenos Ayres. Picture showing the interior of factory of electro-fixture works. (Installed in Palace of Manufactures.)

BELGIUM.

Location:—Installed in the Belgian National Pavilion.

Chemistry, Lighting, Telephony and Various Applications.

GROUP 68.

Societe Chelin, Ltd., Brussels. Accumulators.

Solvay & Co., Brussels. Specimens of chlorate of potash and chlorine.

GROUP 69.

Compagnie des Bronzes, Ltd., Brussels. Electric lighting chandeliers.

Pilate, J. B., Brussels. Electric lighting chandeliers.

Societe Chelin, Ltd., Brussels. Electric mining lamps.

GROUP 70.

Nyst, Frederic, Liege. Telegraph and telephone specialties.

GROUP 71.

Ateliers de Construction, Delhez Brothers & Co., Ltd., Liege. Albums and drawings concerning application of electric motors to mechanical purposes, elevator, cranes, etc.

Ateliers de Construction de la Meuse Co., Ltd., Liege. Albums and drawing of application to mechanical purposes, elevators, cranes, etc.

Belgian Government, Brussels. Administration of the Belgian telegraphic and telephonic services, albums.

Compagnie Internationale d'Electricite, Ltd., Liege. Photographs of apparatus for generating electricity, drawings of motor generators, transformers, electric motors for railways and roadways, methods of control of cars and trains, application to mechanical purposes.

Electricite & Hydraulic Co., Ltd., Charleroi. Plans of application to transportation, electric motors for railways and roadways.

Usines a Cuivre et a Zinc Co., Ltd., Liege. Albums on telegraphic and telephonic services.

BRAZIL.

Location:—Block 23, Aisles Z and G.

Telegraph and Various Applications of Electricity.

GROUP 70.

Telegraphos, Rep. Geral Dos, Capital Federal, Rio de Janeiro. Telegraph apparatus, telegraph instruments, material used for telegraph lines, tools, samples of wire.

GROUP 71.

Intendencia de Manos, Amazonas, Photos of waterworks and electrical plant.

Loschi, Eduardo, S. Paulo. Photographs and publications on electrical river navigation.

Manaos Railway, Amaonas. Photos of railway plant.

Ramos, Dr. F., S. Paulo. Work on industries and electricity.

S. Paulo Tramway, Light and Power Company, S. Paulo. Photographs of electrical plants.

Soucasseaux, Francisco, Minas, Geraes. Photographs of electric plant at Bello Horizonte.

Telegraphos, Rep. Geral Dos, Capital Federal, Rio de Janeiro. Drawings, photographs and books.

CANADA.

Location:—Block 36, Aisle G.

Various Applications of Electricity.

GROUP 71.

Ontario Power Company, Niagara Falls, Ontario. Model and drawings of hydraulic, electric plant.

DENMARK.

Location:—Block 36, Aisle G.

Electro-Chemistry.

GROUP 68.

Hellesens Enke & V. Ludvigsen, Copenhagen. Sample collection of Hellesens' dry batteries.

Annual output (rapidly increasing) 500,000 cells. Used all over Europe. Awarded Gold Medals Stockholm 1897, and Paris 1900.

FRANCE.

Location:—Blocks, 34, 37, 38, 39, 40, 41.

Apparatus for Generating and Using Electricity, and Electro-Chemistry.

GROUP 67.

Belloil, Eugene & Reiss, T., Paris. Insulators, joints.

Berne, J. A., Paris. Carbons for electric machines.

Boudreaux, Louis Francois Joseph, Paris. Electric brushes of all kinds, brush holders.

Compagnie Francaise De Charbons Pour L'Electricite, Paris. Carbons for electrical machines.

Compagnie Des Trefileries Du Havre, Paris. Wires and cables.

Francois, L., Grellou, A., & Co., Paris. Electric wires and cables.

Geoffroy & De Lore, Clichy. Cables for the distribution of electricity.

Grammont, Alexandre, Pont-De-Cheruy, Isere. Wires and cables.

Guenee, Albert & Co., Paris. Electromagnetic clutches and brakes.

Societe Alsacienne De Constructions, Mecaniques, Belfort. Three-phase booster, three-phase variable speed motor and controlling booster. (700 K. W. 2300 V. 3-ph. alternator and exciter, switchboard, transformer, electric pump in operation. Block 52, Aisle G, Palace of Machinery.)

Societe Francaise Des Cables Electriques, Lyons. Samples of high tension electric cables.

Societe Gramme, Paris. Motors, transformers.

Societe "Le Carbone," Levallois-Perret, Seine. Carbon brushes.

Societe "L'Eclairage Electrique", Paris. Three-phase alternator of 1500 K. W. 2400 volts direct connected to steam engine, switchboard and transformers. (Installed in Palace of Machinery, Block 52, Aisles A and 12.)

Societe Industrielle Des Telephones, Paris. Wires and cables.

GROUP 68.

Compagnie Francaise Des Electrodes, Lyons. Carbon electrodes for electric furnaces.

Delafon, Philippe, Paris. Primary and secondary cells.

Fredet, Henri-Brignoud, Isere. Accumulators.

Grammont, Alexandre, Pont De Cheruy, Isere. Insulated wires for accumulators.

Leclanche & Co., Paris. Primary and secondary cells.

Societe Gramme, Paris. Accumulators.

GROUP 69.

Arens, A., Paris. Electric chandeliers and lamps.

Bardon, L., 61 bl. National, Clichy, Seine. Electric arc lamps, and lighting apparatus.

Belloil, Eugene & Reiss, T., Paris. Patented wire joints and fuses.

Berne, J. A., Paris. Arc lamp carbons.

Boulanger, Charles, Paris. Electroliers, brass lighting fittings and electricity.

Clerc, Louis, Paris. Special electric lamp "Lampe Soleil" (Sun Lamp).

Compagnie Des Trefileries Du Havre, Paris. Interior wires.

Compagnie Francaise De Charbons Pour L'Electricite, Paris. Arc lamp carbons.

Compagnie Generale D'Electricite, Paris. Switches, sockets, incandescent lamps and insulating materials.

Fontaine-Souverain, Denis, Dijon. Sliding ladder "La Dijonnaise."

Francois, L., Grellou, A. & Co., Paris. Interior wires.

Electric Lighting, Telephones and Telegraphs.

- Gaillard, Achille, Beziers. Impregnated wooden posts for electrical insulation.
- Geoffroy & De Lore, Clichy. Interior wires.
- Grammont, Alexandre, Pont De Cheruy, Isere. Interior wires.
- Guinier, Édouard, Paris. Brass electric light fittings electroliers.
- Letheule, P., Paris. Push button regenerative fuse.
- Milde Ch. Fils & Co., Electroliers, Electric light fittings.
- Paz & Silva, Paris. Decorative fittings and electric signs.
- Poilly De Brigode, Folembay, Aisne. Glass insulators.
- Societe Anonyme Des Anciens Etablissements, Parvillee Freres & Co., Paris. Porcelain Insulators.
- Societe Francaise D'Appareillage Electrique, Grivolos, Paris. Electric light fittings.
- Societe Francaise Des Cables Electrique, Lyons. Interior wires.
- Societe Gramme, Paris. Incandescent lamps.
- Societe Industrielle des Telephones, Paris. Electric arc lamps.
- Societe "Le Carbone," Levallois-Perret, Seine. Arc lamp carbons.
- Vigreux & Brillie, Levallois-Perret, Seine. Arc lamps.
- Weismann, Gustave, Paris. Weismann electric pearl system for lighting apparatus.
- GROUP 70.**
- Administration des Postes, Telegraphes and Telephones, Paris. Collection of French telegraph and telephone apparatus.
- Bagrachow, Gregoire, Paris. Telephones and telegraphic apparatus and materials.
- Compagnie Des Trefileries Du Havre, Paris. Telegraph and telephone wires.
- Darras, Alphonse, Paris. Telegraphic apparatus and relays, etc.
- Ducretet, Eugene, Paris. Wireless telegraphic apparatus, loud speaking telephonic apparatus.
- Francois, L., Grelou, A., & Co., Paris. Telegraph and telephone wires.
- Gaillard, Achille, Beziers. Impregnated telegraph and telephone posts.
- Geoffroy & De Lore, Clichy. Telegraph and telephone wires.
- Kotyra, Maximilien, Paris. Telephonic apparatus.
- Milde, Ch. Fils & Co., Paris. Telephone materials.
- Paz & Silva, Paris. Telephone apparatus.
- Poilly De Brigode, Folembay, Aisne. Telegraph and telephone insulators.
- Societe Anonyme Des Anciens Etablissements Parvillee Freres & Co., Paris. Telegraph and telephone porcelain insulators.
- Societe Anonyme D'Electricite & D'Automobiles Mors, Paris. Telegraphic apparatus.
- Societe Industrielle Des Telephones, Paris. Telegraphic and telephonic apparatus, telegraph and telephone cables.
- GROUP 71.**
- Ancel, Louis, Paris. Radiographic apparatus.
- Association des Ouvriers En Instruments de Precision, Paris. Scientific instruments.
- Bardon, L., Clichy, Seine. Electric igniters.
- Bergonie, Dr. Prof., Bordeaux, Records of electricity.
- Berne, J. A., Paris. Carbons for electric heating.
- Blondel, Andre, Paris. Measuring apparatus, oscillograph.
- Chauvin, Armoux, Rene, Paris. Measuring apparatus.
- Compagnie Continentale pour La Fabrication des Compteurs, Paris. Electricity meters.
- Compagnie Francaise des Cables Telegraphiques, Paris. Various documents concerning the working of submarine cables.
- Compagnie Francaise des Compteurs Aron, Paris. Electricity meters, electric energy meters.

Various Applications of Electricity.

- Compagnie Generale d'Electricite, Paris.** Photographs of their factories and power plants.
- Compagnie pour la Fabrication des Compteurs et Material d'Usines a Gaz, Paris.** Electricity meters and measuring apparatus.
- Ducretet, E., Paris.** X-Ray, high frequency, radiophone, wattmeters, pyrometers, galvanometers.
- Guenee, Albert & Co., Paris.** Electric signals.
- Hillairet, Huguet, Paris.** Model and drawings of electric capstan.
- Holzschuch, Jacques & Bonnemaïson, Paul, Paris.** Plans of a central high pressure electric station, 100,000 H. P.
- Lordereau, Gabriel, Lyon.** Graphic boards.
- Portevin, Hippolyte, Paris.** Diagrams and photographs of electric light installations.
- Radiguet & Massiot, Paris.** Medical electricity, radiography.
- Richard, Jules, Paris.** Recording instruments for physics and photography, voltmeters.
- Roux, Gaston, Henri, Charles, Paris.** Diagram illustrating the progress in electrical installation work in France.
- Societe Alsacienne de Constructions Mecaniques, Belfort.** Photographs of electric power plants.
- Societe Anonyme D'Electricite et d'Automobiles Mors, Paris.** Electric signals for railroads.
- Societe des Etablissements, Henry Lepaute, Paris.** Drawings of optical lenticular lamps for light houses. Electric clocks.
- Societe Francaise des Cables Electrique, Lyons.** Drawings high-tension cables.
- Societe, Gramme, Paris.** Electrical instruments.
- Societe Insutrielle des Telephones, Paris.** Measuring instruments.
- Societe "L'Eclairage Electrique," Paris.** Photographs and drawings of electrical machinery.
- Societe pour l'Exploitation des Brevets Dolter, Paris.** Model of surface contact system of traction.
- Vaudrey, Paul, Paris.** Electric alarm clocks.
- Weyl, Michel, Paris.** Plans and views of dynamos and complete installations of electric stations for transportation.
- Woittequand, Charles, Charleville.** Electric bells.

FRENCH COLONIES.

- Postes Et Telegraphes, Tananarive.** Map showing telegraphs and telephones of Madagascar.

GERMANY.

Location:—Block 35, Aisles F, G and V.

Electro-Chemistry and Apparatus for Using Electricity.

GROUP 67.

- Bremer, Hugo, Metallwaren und Elektrotechnische Fabrik Nehein a. d. Ruhr** Thermo-Electro-motors.
- Land-und Seekabelwerke, A. G., Coeln-Nippes.** Cables for high tension up to 50,000 volts, junction boxes, lightning arresters.
- Ruhstrat, Gebrueder, Goettingen.** Switch-board apparatus. (Installed in Palace of Education, Block 10.)
- Siemens & Halske, A. G., Berlin.** High-tension transformers. (Installed in Palace of Education, Block 10.)
- Zwarg, Julius, Otto, Freiburg, i. S.** Materials and apparatus for protection against lightning. (German Pavilion.)

GROUP 68.

- Abegg, Dr. Prof., Breslau.** Apparatus for measuring the mobility of iones.
- Apel, W., Goettingen.** Electro-chemical apparatus.
- Bartels, Georg, Mechaniker, Goettingen.** Electrometer according to Nernst-Dolezalek with amber insulation.
- Borchers, Dr., Prof. Aachen.** Electrical furnaces.
- Bredig, Dr. Prof., Heidelberg.** Electro-chemical apparatus.
- Classen, Dr., Prof., Aachen.** Apparatus for quantitative analysis by electrolysis.
- Cohen, Dr., Prof., Goettingen.** Electro-chemical coal precipitates.
- Diedrichs, Carl, Goettingen.** Telescope for use in electro-chemistry.
- Drude, Dr., Prof., Giessen.** Electro-chemical apparatus.
- Elbs, Dr., Prof., Giessen.** Electro-chemical apparatus, preparations obtained by an electro-chemical way.
- Guenther & Tegetmeyer, Braunschweig.** Scientific electrical instruments for electro-chemical use. (Installed in Palace of Education, Block 10.)

- Harries, Dr., Prof., Charlottenburg.** Apparatus for distilling in vacuo-ozone apparatus; organic preparations.
- Heraeus, W. C., Hanau.** Electrical furnaces, platinum apparatus. (Installed in Palace of Education, Block 10.)
- Hugerstoff, F., Leipzig.** Amperemano-meter according to Bredig.
- Kerker, Erwin, Mechaniker, Breslau.** Apparatus for measuring the mobility of iones according to Abegg.
- Koehler, Fritz, Mechaniker, Leipzig.** Chemograph and other electro-chemical apparatus according to Ostwald.
- Mittelbach, Robert, Mechaniker, Goettingen.** Apparatus for concentration Chains according to Nernst.
- Nernst, Dr., Prof., Goettingen.** Electro-chemical apparatus, electro-chemical laboratory table.
- Ostwald, Dr., Prof., Leipzig.** Electro-chemical apparatus.
- Ruff, Dr., Prof., Berlin.** Apparatus, inorganic and organic preparations.
- Ruhstrat, Gebrueder, Goettingen.** Electro-chemical laboratory table and switchboard.
- Schmidt, W., Mechaniker, Giessen.** Electro-chemical apparatus according to Elbs & Drude.
- Vereingete Fabriken fuer Laboratoriumsbedarf, Berlin.** Apparatus for chemical laboratories.

GROUP 69.

- Bremer, Hugo, Metallwaren und Elektrotechnische Fabrik, Neheim, a. d. R.** Bremer arc light.
- Conradty, C., Nuernberg.** Carbon supplies for electric arc lamps. (German Pavilion).
- Hartmann & Braun, A. G., Frankfurt a. M.** Scientific instruments for electric lighting. (Installed in Palace of Education, Block 10.)

Electric Lighting, Telegraphs and Telephones.

Kruss, A., Hamburg. Electrical scientific instruments for photometry. (Installed in Palace of Education, Block 10.)

Regina Bogenlampenfabrik, Coeln-Suelz. Regina arc lights. (German Pavilion.)

Schmidt, F. & Haensch, Berlin. Electrical scientific instruments for photometry. (Installed in Palace of Education, Block 10.)

Siemens & Halske, A.-G., Berlin. Instruments for measuring the insulation of electric installation. (Installed in Palace of Education, Block 10.)

Siemens-Schuckertwerke, Berlin. Searchlights. (German Pavilion.)

GROUP 70.

Cerebotani, Dr., Prof., Muenchen. Picture telegraph, type setting telegraph, meteorological telephone.

Land-und Seekabelwerke, A. G., Coeln-Nippes. Cables for telegraphy and telephony, appliances.

Lorenz, C., Telephon-und Telegraphenwerke, Berlin. 50 m. Telegraph cables. (German Railroad-outdoor exhibit).

Siemens & Halske, Berlin. Pupin coils of self-induction for telephone cables and overhead lines. (Installed in Palace of Education, Block 10.)

Silbermann, A., Metallwarenfabrik, Berlin, O., Prof. Dr. Cerebotani's telegraphic apparatus.

GROUP 71.

Aeronautisches Observatorium des Kgl. Meteorol. Institute, Berlin. Scientific electrical instruments. (Installed in Palace of Education, Block 10.)

Bartels, Georg, Mechaniker, Goettingen. Electrometer with amber insulation.

Borchers, Dr., Prof., Aachen. Electrical furnaces.

Bosch, J. & A., Strassburg, i. E. Scientific electrical instruments.

Bredig, Dr., Prof., Heidelberg. Ampere-manometer.

Burger, Reinhold, Berlin. Scientific electrical instruments. (Installed in Palace of Education, Block 10.)

Classen, Dr., Prof., Aachen. Models of apparatus for quantitative analysis by electrolysis.

Continental Caoutchouc & Gutta-Percha Company, Hanover. Scientific electrical instruments. (Block 10, Palace of Education Building.)

Continentale Gesellschaft fuer Elektrische Unternehmungen, Nuernberg. Drawings and pictures of electrical suspension roads. (Transportation Palace, Aisle J, Post 155.)

Drude, Dr., Prof., Giessen. Dielectric apparatus.

Fuess, R., Steglitz, Berlin. Scientific electrical instruments. (Block 10 Palace of Education.)

Goetze, F. O. R., Leipzig. Scientific electrical instruments. (Block 10, Palace of Education.)

Guenther & Tegetmeyer, Braunschweig. Scientific electrical instruments. (Block 10, Palace of Education.)

Gundlach, E., Gehlberg, i. Th. Scientific electrical instruments. (Block 10, Palace of Education.)

Harries, Dr., Prof., Charlottenburg. Modern ozone apparatus.

Hartmann & Braun, A. G., Frankfurt a. M. Electrical scientific instruments and electrical magnetic measuring instruments. (Block 10, Palace of Education.)

Heraeus, W. C., Hanau. Electrical furnaces—platinum apparatus. (Block 10, Palace of Education.)

Juedel & Co., Max, Braunschweig. Electric railway signal appliances. (Installed in German outdoor exhibit.)

Keiser & Schmidt, Berlin. Electrical measuring instruments.

Kohl, Max, Chemnitz. Scientific electrical instruments. (Block 10, Palace of Education.)

Kruss, A., Hamburg. Electrical scientific instruments. (Block 10, Palace of Education.)

Leppin & Masche, Berlin. Scientific electrical instruments. (Block 10, Palace of Education.)

"Magneta" Factory of Electrical Clocks, Singen. Electrical wall clocks.

Mittelbach, Robert, Mechaniker, Goettingen. Mercury and silver voltmeter.

Various Applications of Electricity.

- Mueller-Uri, Richard, Braunschweig.** Scientific electrical instruments.
- Ostwald, Dr., Prof., Leipzig.** Scientific electrical apparatus.
- Physikalisch-Technische Reichsanstalt, Charlottenburg.** Scientific electrical instruments.
- Preussisch-Hessische Eisenbahn Gemeinschaft, Berlin.** Electric signal system. (Outdoor railroad exhibit.)
- Riedinger, A., Augsburg.** Scientific electrical instruments. (Block 10, Palace of Education.)
- Schmidt, W., Mechaniker, Giessen.** Electrical scientific instruments. (Block 10, Palace of Education.)
- Schnee, C. E., Wiesbaden.** Electrical bath of four cells.
- Schwarzhaupt, Spiecker & Co., G. m. b. H., St. Goar a. R.** Two electric pulverizers. (Block 10, Palace of Education Bldg.)
- Siemens & Halske, Berlin.** Electric railway signal appliances, scientific electrical instruments, Roentgen cabinet. (Block 10, Education Bldg.)
- Studiengesellschaft fuer elektrische Schnellbahnen, Berlin.** Pictures of rapid transit cars and report of results.
- Vereinigte Fabriken fuer Laboratoriumsbedarf, Berlin.** Apparatus for instruction in electricity. (Block 10, Palace of Education.)
- Vesler & Schoch, Leipzig.** Alarm clocks and fire alarm apparatus. (Block 10, Palace of Education.)
- Wolff, Otto, Berlin.** Electrical scientific instruments. (Block 10, Palace of Education.)
- Zimmermann & Buchlos, Berlin.** All appliances for electric signals. (Installed in German outdoor exhibit.)

GREAT BRITAIN.

Location:—Block 7, Aisles D and T.

Apparatus for Using Electricity.

GROUP 67.

- Behr, F. B., London.** Working Model of high-speed electric mono-railway.
- Consolidated Electrical Company, Ltd., London.** Switchboard and controlling apparatus.
- Darton, F. & Company, London.** Motors and fan motors.

GROUP 68.

- Sherard Cowper-Coles & Company, Ltd., London.** Electro-galvanizing. Parabolic mirrors; copper tubes and sheet made electrolytically. Sherardizing.

GROUP 69.

- Consolidated Electrical Company, Ltd., London.** Switches and appliances for electric lighting and power.
- Cosser, A. C., London.** Electric lamps for medical, military and telephone use.
- Everett, Edgecumbe & Company, London.** Portable lamp testing sets. Photometers.

GROUP 70.

- Consolidated Electrical Co., London.** Telegraph and telephone apparatus.
- General Post Office, London.** Wheatstone automatic duplex telegraph; quadruplex sets; single current sounder set; ancient Morse embosser and bottle inker; modern inker; samples of telegraph and telephone cables.
- India Rubber and Gutta Percha & Telegraph Works Co., Ltd., London.** Submarine and other cables.
- Muirhead & Co., London.** Wireless and submarine telegraph apparatus and recorders.

GROUP 71.

- Behr, F. B., London.** Drawing and photographs showing details of high-speed electric railway car.
- Cambridge Scientific Instrument Co., Cambridge.** Electrical measuring instruments, recording instruments, oscillographs. Diagrams obtained by Duddell's oscillograph, magnetograph and electric recorders. Electrical means of measuring temperature by thermo-couple.
- Cosser, A. C., London.** X-ray and electrical surgical apparatus. Small glow lamps for illuminating night sights as used in naval gunnery. "Sinthariscopes" showing scintillations of radium.
- Crompton & Co., Ltd., Chelmsford.** Potentiometers, standard resistances, galvanometers.
- Darton, F. & Co., London.** Instruments. Induction coil for X-Ray work.
- Elliott Bros., London.** Measuring apparatus.
- Everett, Edgecumbe & Co., London.** Electric general measuring apparatus.
- Kelvin & James White, Ltd. Glasgow.** Lord Kelvin's electrical measuring instruments.
- Nalder Bros. & Co., London.** Scientific electrical and testing instruments.
- Nalder Bros. & Thompson, Ltd., London.** Ammeters and voltmeters; recording instruments; automatic accumulator switches; portable standard instruments.
- Paul, Robt. W., London.** Electrical testing instruments.
- Synchrone Company.** Electric clocks, a system of electrically-propelled dials controlled by a self-driven pendulum—in operation.

ITALY.

Location:—Block 18, Aisle Y.

Apparatus for Using Electricity.

GROUP 67.

Ing. Gola & Co., Torino. Series lighting arresters.

Pirelli & Co., Milan. Insulated wires and cables.

Societa Italiana dell'Electrocarbonium, Rome. Carbon brushes.

GROUP 68.

Olivetti & Co., Milan. Mercury commutator for accumulators.

Pirelli & Co., Milan. Rubber covered wires.

Societa Italiana dell'Electrocarbonium, Rome. Electrodes for electric furnaces.

GROUP 69.

Pirelli & Co., Milan. Interior wires and cables.

Societa Italiana dell'Electrocarbonium, Rome. Arc lamp carbons.

GROUP 70.

Pirelli & Co., Milan. Telegraph and telephone cables.

GROUP 71.

Associazione Electrotecnico Italiano, Rome. Pictures of Italian central stations, electrochemical works, factories, and railways.

Ministero delle Poste l e Telegrafi, Rome. Publications of telegraph, telephone and postal service in Italy. Photographs.

Ministero di Agricoltura industria e commercio. Historical exhibit of the first apparatus of Volta; Parinotti; Belli; Ferraris.

Olivetti e C., Milan. Indicating, recording and integrating instruments.

JAPAN.

Location:—Block 16, Aisle A.

Generators, Telephones and Various Applications.

GROUP 67.

Oki & Co., Tokio. Wires and cables.

Shibaura Works of Mitsui & Co., Tokio. Extra high-tension transformer for testing 150,000 volts, continuous current dynamo, coil for magnetic field or dynamo.

GROUP 70.

Oki & Co., Tokio. Morse's Ink Writer; double current key; telephone transmitter; solid back telephone transmitter; table telephone; annunciation drop; switchboard; cable; cord and wires.

GROUP 71.

Japan Electric Association, Tokio. Table of electric industry in Japan.

Kyoto City Council, Kyoto. Photographs of plan and history of canal route with water power electric plant maps.

Oki & Co., Tokio. Wheatstone's bridge; tangent, differential and astatic galvanometer. Tsuboi's block instrument.

Saiga Tokichi, Tokio. Models and photographs of water power electric plant in Iyo.

Tanaka & Co., Tokio. Electric medical instrument.

MEXICO.

Location:—Block 23, Aisle Z.

Various Applications of Electricity.

GROUP 71.

Compania Electrica e Irrigadora del el Estado de Hidalgo, Mexico, D. F. Photographs, plans, etc., of its works and hydro-electric installations.

Campania Mexicana de Electricidad, Mexico, D. F. Maps, drawings, photographs and diagrams of its works, and plans, diagrams and photographs of lighting system.

Direccion General de Obras Publicas, Mexico, D. F. Collection of maps and drawings of the lighting system of the City of Mexico.

Fenochio, Alfonso Professor, Puebla, Puebla. Report about electricity in the state of Puebla.

Ferrocarriles del Distrito Federal, Mexico, D. F. Photographs of the electric

tramway systems of the City of Mexico.

Ferrocarril Electrico de Lerdo A Torreon, Torreon, Coahuila. Different photographs of the electric cars and plant.

Gonzalez, Benigno, Ingeniero, Puebla, Puebla. Instructions for the application of electricity in the Puebla State School.

Santa Cruz Y Olivier, Mexico, D. F. A map showing the electric railroad called "Superficial Mexicano" and description of it. (Installed in the Palace of Liberal Arts.)

Secretaria de Comunicaciones Y Obras Publicas, Mexico, D. F. Photograph album of the works of the "Compania Electrica e irrigadora" of the State of Hidalgo. A map of telegraphic lines of the Republic.

PORTUGAL.

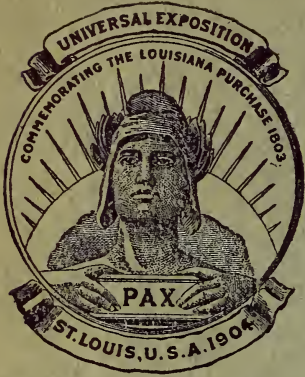
Location:—Block 16, Aisle A.

Various Applications of Electricity.

GROUP 71.

Mackado, Virgilio, Lisbon. Photographs
and books of electrical appliances.

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OFFICE OF THE PRESIDENT

Saint Louis, February 29, 1904.

The Official Catalogue Company,
Saint Louis, Missouri.

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In compliance with your request, I hereby certify that your Company has the only contract with the Louisiana Purchase Exposition Company to publish the Official catalogue of exhibits, as can be seen by reference to the terms of said contract.

Yours truly,

D. R. Francis
President.