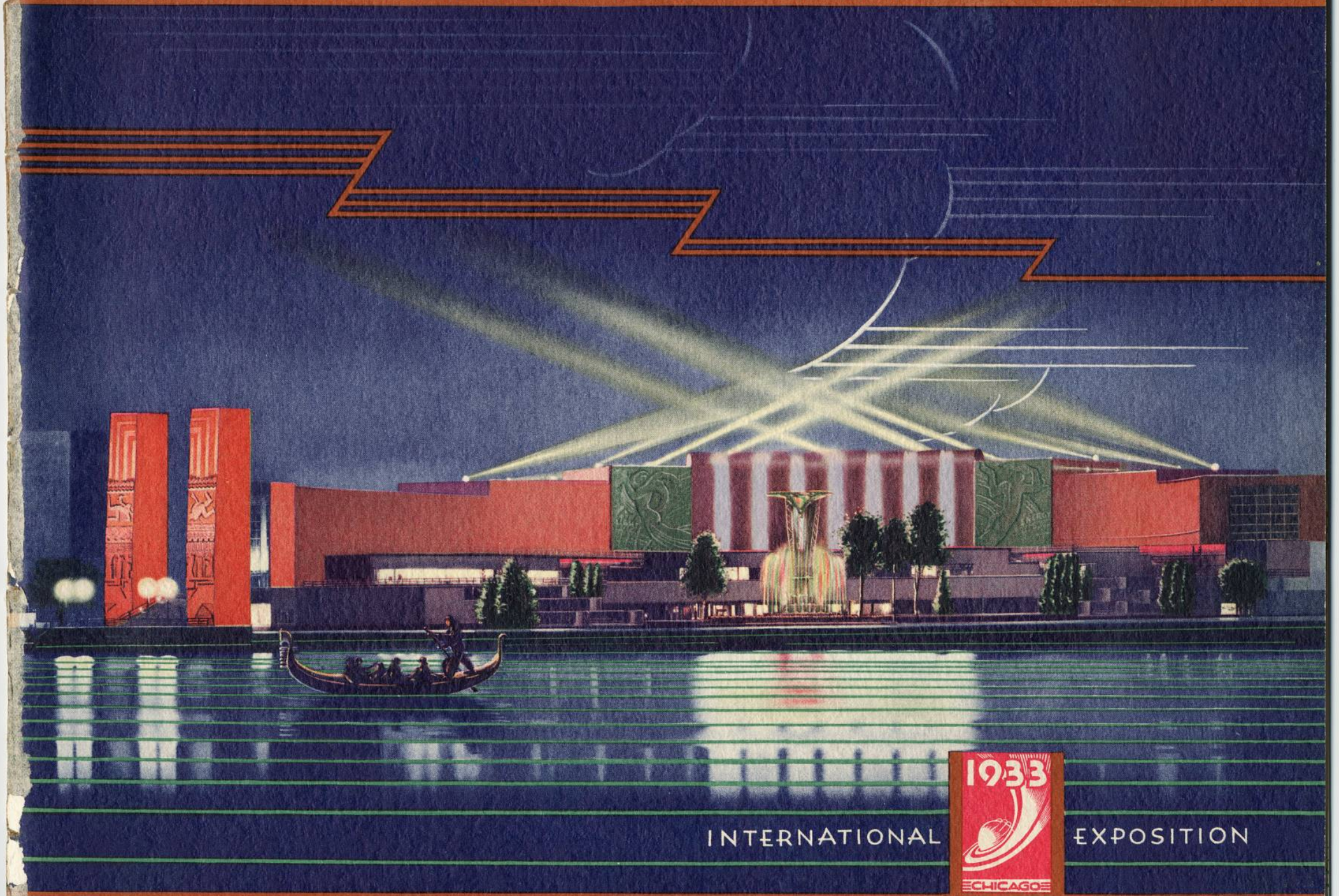
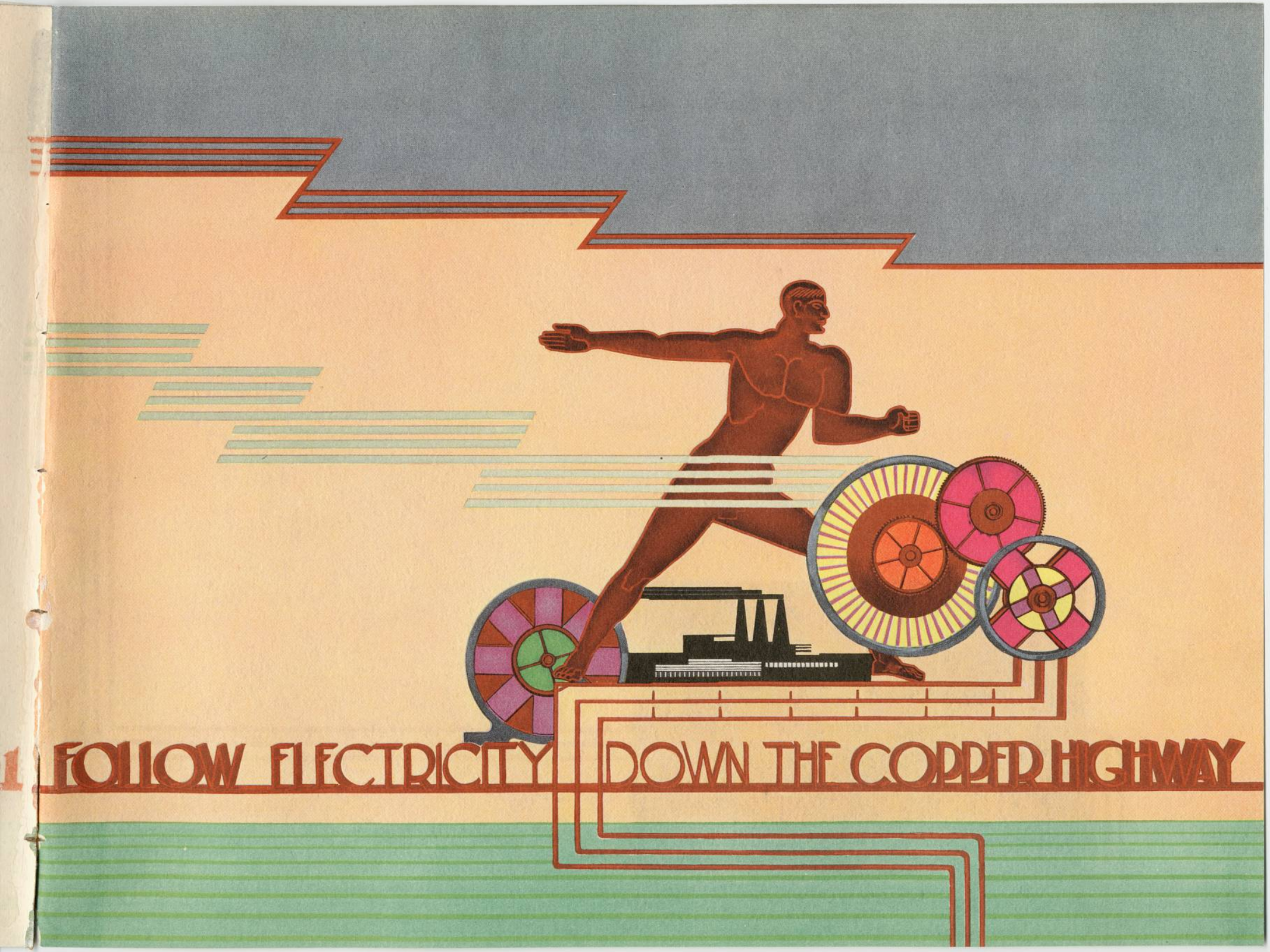
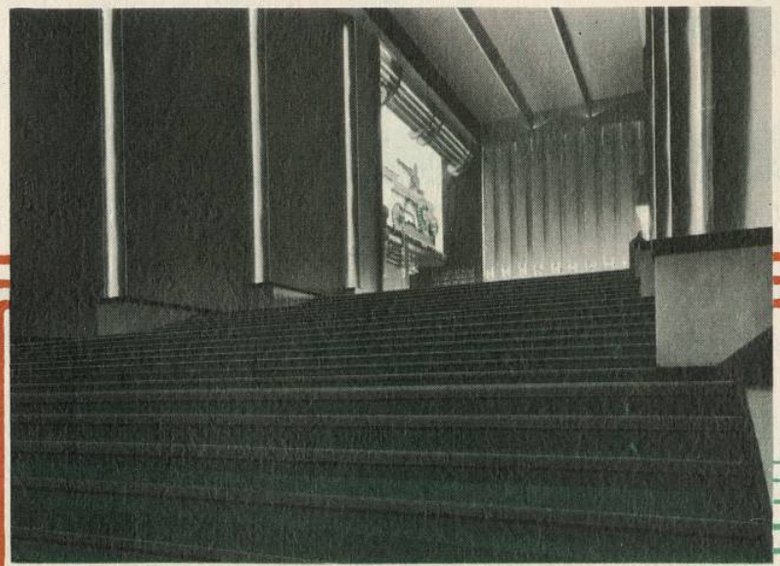
ELECTRICITY AT WORK



INTERNATIONAL EXPOSITION

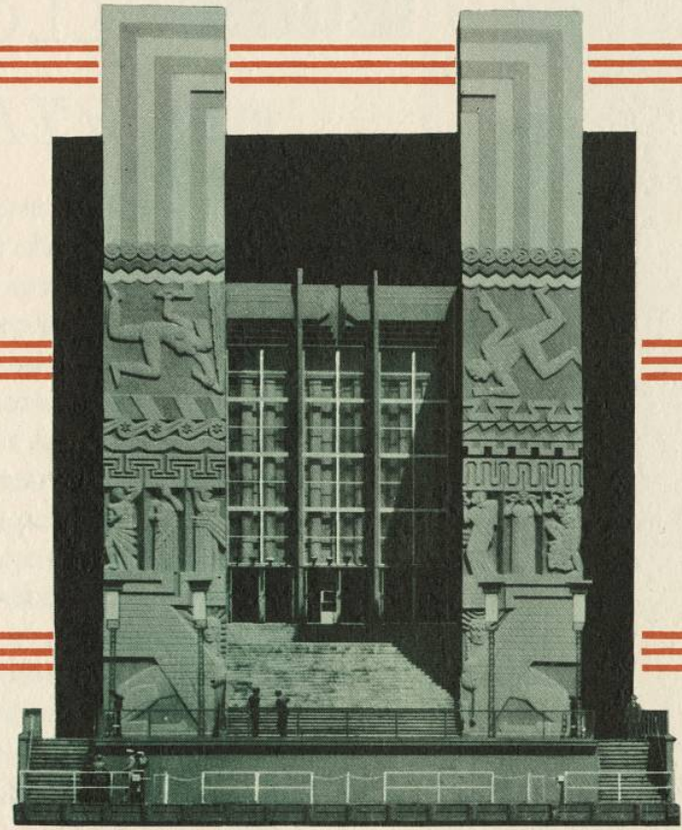
A CENTURY OF PROGRESS


FOLLOW ELECTRICITY DOWN THE COPPER HIGHWAY



ELECTRICITY AT WORK

PORTRAYING THE GENERATION, TRANSMISSION, DISTRIBUTION AND UTILIZATION OF ELECTRICITY



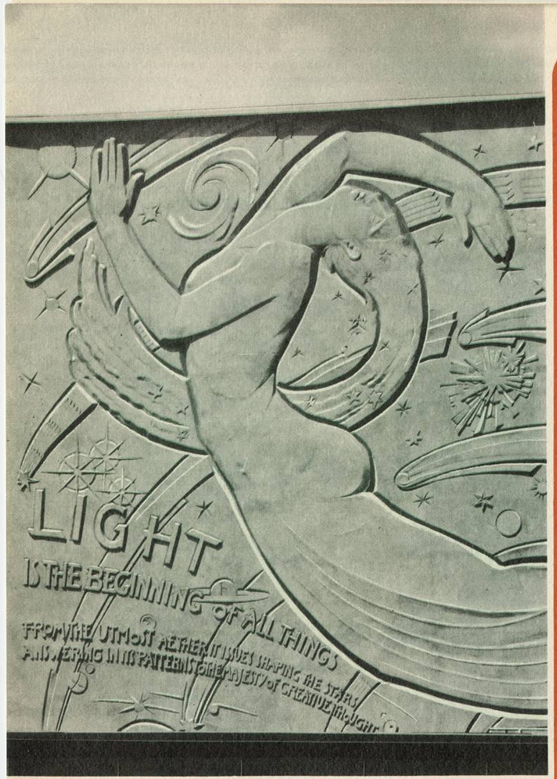
THE EXHIBIT OF

THE ELECTRIC LIGHT AND POWER INDUSTRY

AT

A CENTURY OF PROGRESS EXPOSITION

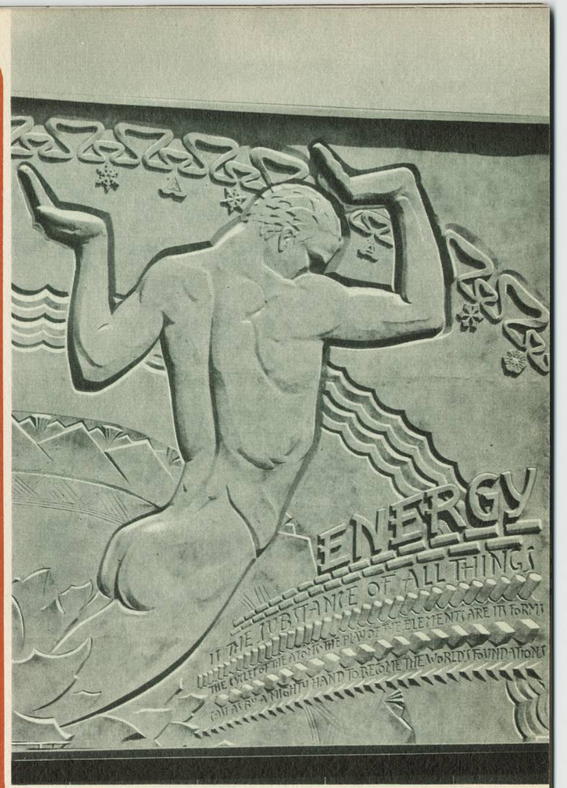
CHICAGO-1933

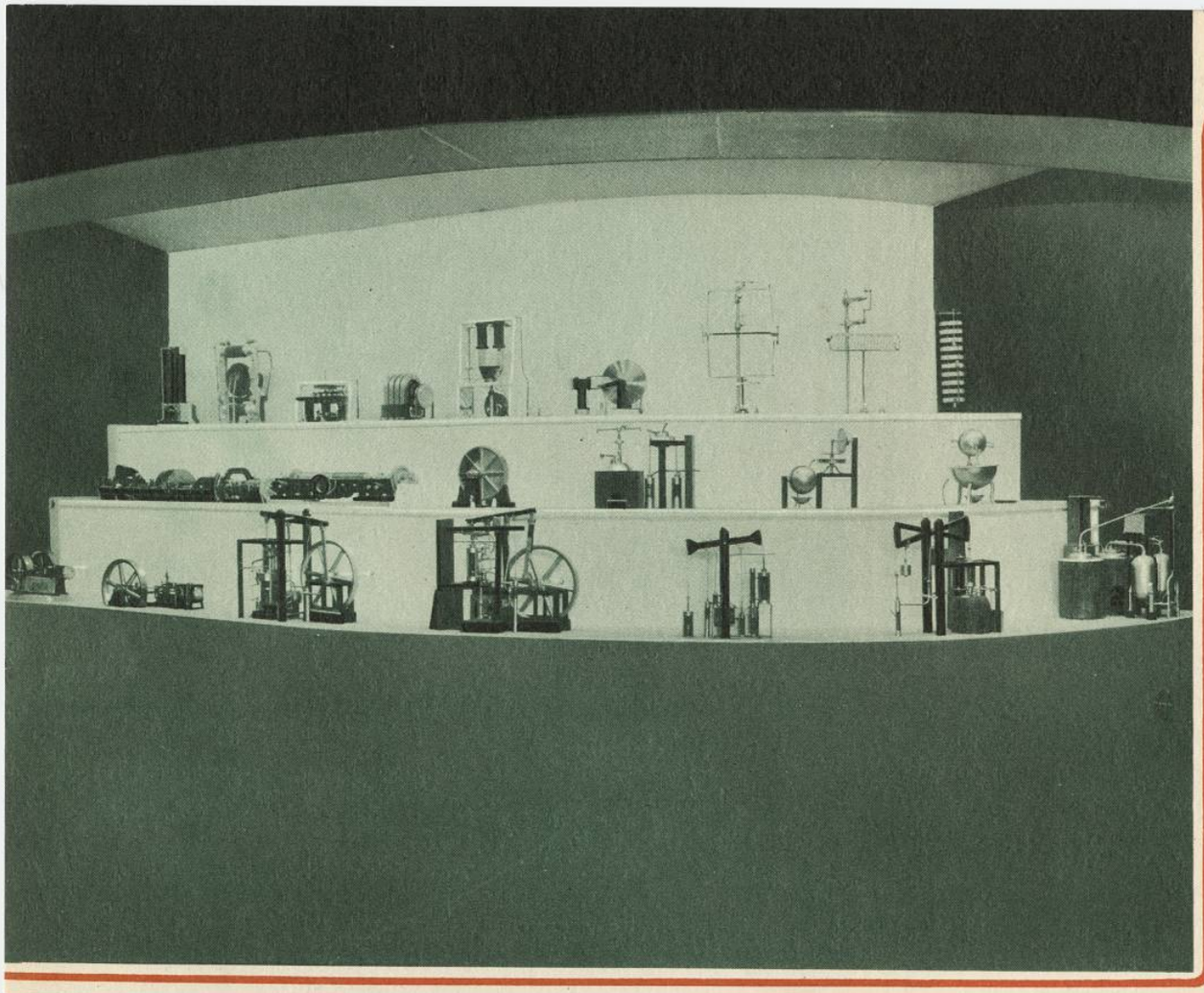


FOREWORD

Follow Electricity Down * * * The Copper Highways

THIS book is offered as a lasting record of Electricity at Work, the exhibit of the electric light and power industry, as presented in A Century of Progress Exposition, in Chicago, in nineteen hundred and thirty-three . . . . For those who visited this display, it is hoped that these pages will be welcomed as a memento of pleasant hours and added knowledge of useful electric services . . . . For those to whom circumstance was in that regard less kindly, may it appeal as in some degree worth while . . . . Planning this exhibit was not an easy task, because there is within the range of the handiwork of electricity a domain so vast as to require not merely an exhibit within an Exposition, but an Exposition as a whole . . . . Hence, the problem of selection was difficult—the problem of choosing that which was best suited, within the limitations of the exhibit space available . . . . The technical, the economic, the social significance of electricity's contributions to modern civilization, each, alone, might command a vast showing without exhausting the vivid truths that lie within their stories . . . . Stories that tell of freeing mankind from cruel labor, of movement toward more gracious living, toward that capacity for appreciation of spiritual values which builds upon relief from too great physical burdens . . . . It was believed by those who planned this exhibit that within the industry it represents was measurable accomplishment in furtherance of those high purposes . . . . Goals achieved within the short span of a quarter-hundred years that outstripped the fruits of full centuries gone before . . . . That in the enchanting drama unfolded by this Exposition, electricity in all modesty might truthfully be cast in the role of Great Cooperator, extending to all other industry its hand of magic . . . . So, upon that as a major theme the exhibit was planned and built, as this book shows . . . . In hopefulness that it would meet its opportunity . . . . In acknowledgment that the industry of electric light and power owes its growth to the quick acceptance by the American people of new things that make for progress . . . In confidence that whatever of attainment is disclosed in this exhibit is augury of still greater achievements for mankind.





HISTORICAL MODELS

*

TWENTY-ONE important forerunners to the development of modern electrical service are reproduced in exact and actually functioning miniatures, and grouped together.

These historic models present three lines of development. One series, which is shown on the topmost shelf of the exhibit, begins with Allessandro Volta's electric cell (1800) and ends with Thomas Edison's bi-polar generator (1879). From right to left in the top row are: the electric cell; magnetic properties of an electric circuit (Andre M. Ampere—1820); electro magnetism (Hans C. Oersted—1820); magneto-electric machine (Michael Faraday—1831); magneto-electric machine (Hippolyte Pixii—1832); shuttle armature dynamo (Dr. Werner Siemens—1856); D. C. dynamo (Antonio Pacinnotti—1865); ring armature dynamo (Z. T. Gramme—1871), and Edison's generator.

On the second and bottom rows are two groups of miniatures of early inventions in steam engine development. Reading chronologically from right to left on the second row are: the Hero turbine (Aeolipile—120 B.C.); the impulse turbine (Giovanni Branca—1629); the reaction turbine, (Wolfgang DeKempelen—1784); the radial flow turbine (Robert Wilson—1848); the non-condensing steam turbine (Sir Charles Parsons—1884); and the steam turbine of Gustave DeLaval, completed in 1889.

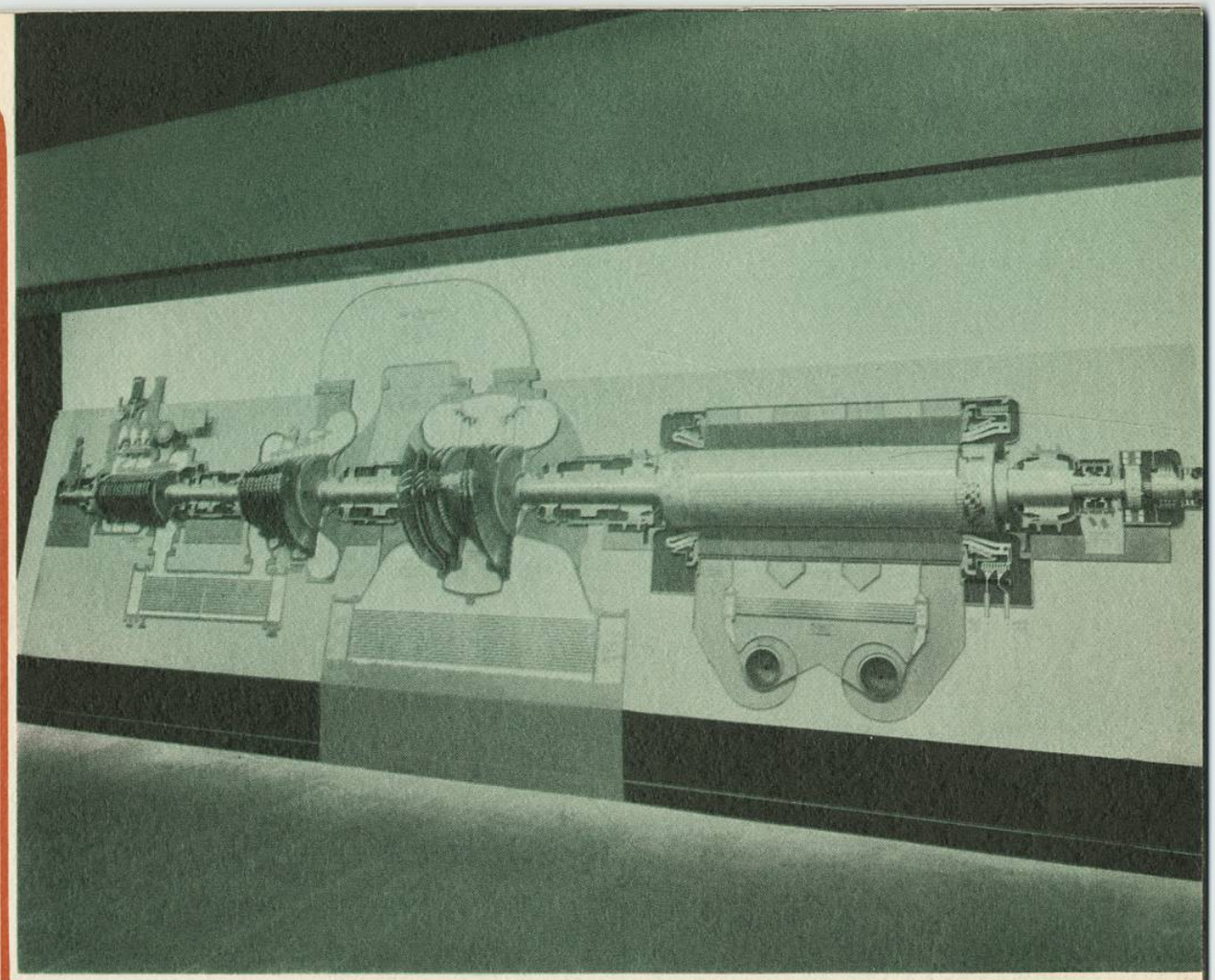
On the bottom row, reading from right to left are: Thomas Savery's pumping engine and boiler, 1698; pumping engine and boiler (Thomas Newcomen—1711); single acting steam engine (James Watt—1769); double acting steam engine (James Watt—1782); compound steam engine (Arthur Woolf—1804); improved steam engine (George H. Corliss—1849), and the high speed horizontal steam engine (1870-1890).

SECTION OF MODERN TURBO-GENERATOR

*

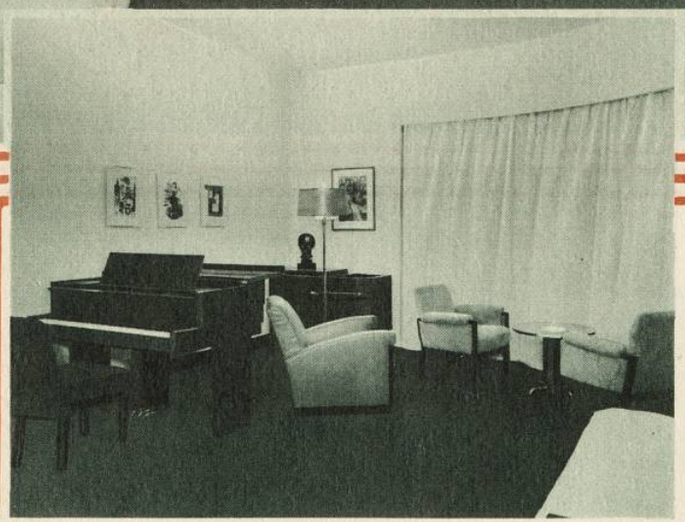
THE steam turbine driving an electricity generator in the modern power plant is, in principle, the simplest power producing machine man has ever made. Steam blows upon blades arranged radially about the periphery of a wheel and causes the wheel to revolve. Put a number of such wheels upon a single shaft, let the steam as it expands after blowing on one wheel then blow upon the next and you have a steam turbine.

The machine illustrated by this exhibit is the largest single shaft steam turbine yet built. It develops a force of 105,000 kilowatts or over 140,000 horse power when running at 1800 revolutions per minute. Steam enters the turbine at a pressure of 600 pounds per square inch and at a temperature of 750 degrees Fahrenheit. The steam passes first through the 16 stages of the first expansion and emerges considerably cooled and reduced in pressure. Between the first and second expansions is a "reheater" in which new heat is added to the steam. The second expansion contains eleven stages and because the steam has increased in volume this part of the turbine is a little larger than the first. The third expansion of three stages is the largest of all since the steam is being expanded to a pressure considerably below the normal air pressure of the atmosphere.



Leaving the third cylinder the steam enters the partial vacuum of the condenser where it returns to the state of water and is carried back to the boilers to begin the cycle over again.

Directly coupled to the turbine shaft is the rotating field of the electric generator. The magnetic effect of the field thus moves rapidly through the stationary coils of the armature, inducing in them electric currents which are carried out from the generator to be used in the innumerable ways in which electricity is applied to the work of the modern world.



ALMOST undreamed-of developments in home comfort are here presented: the decorative triumphs of indirect, colored lighting, the harmonious projection of color from the clavilux, and many other achievements in beauty and automatic convenience made possible by electricity.

THE LIVING ROOM

*

HOW HOMES of the future are to be made more livable and beautiful, transformed by the magic of electricity into havens of complete comfort and enjoyment, is presented in convincing fashion in the Model Living Room.

Air conditioning controls the temperature winter and summer. Concealed cove lighting not only provides general illumination but it can also be used to give tonality to the walls and room. With the "plug-in" moulding it is easy to have a special lamp wherever it is needed. There are reading lamps, indirect portable lamps, health lamps that give the benefit of a summer sun, and night lights, too.

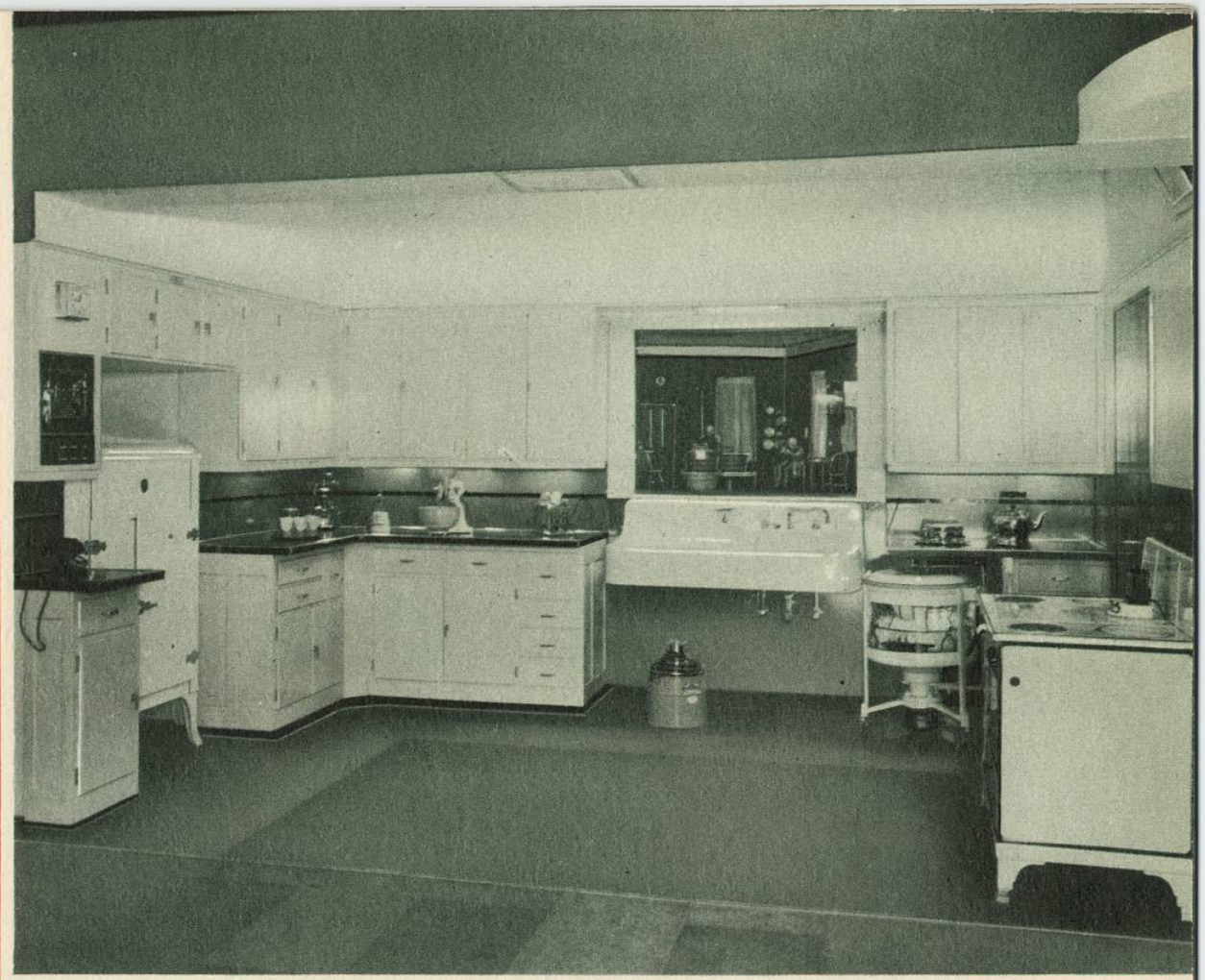
One of the novel pieces of equipment in the room is the color projector which makes it possible to project constantly changing symphonies of color on the wall. Other electric equipment available for the entertainment of the family includes an electric phonograph, a radio with remote control, and a motion picture projector with which it is possible to have either silent or talking movies.

THE ELECTRIC KITCHEN

*

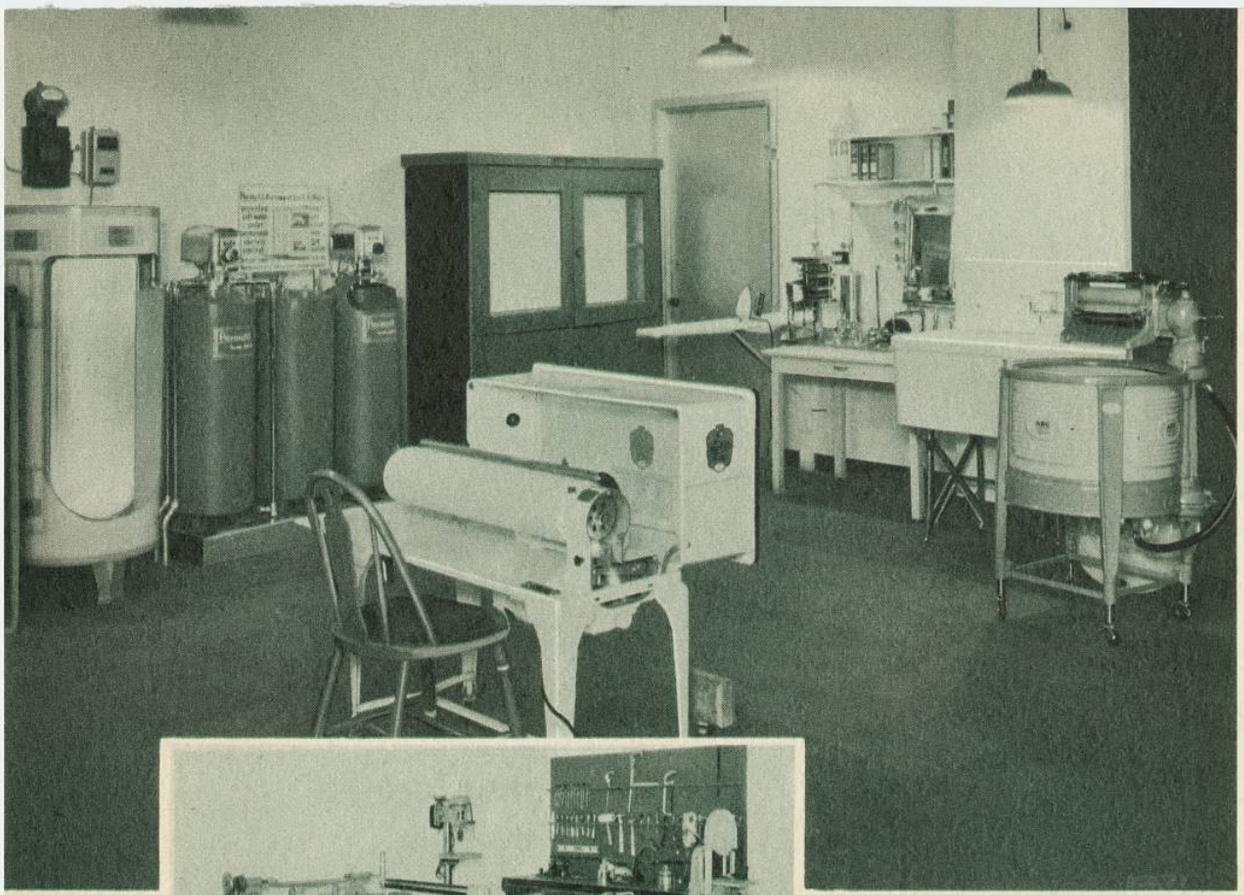
KITCHENS of today and yesterday have a most important part in this display. Kitchens of tomorrow also are forecast, for while the fully electrified kitchen shown is such as any home could have today, it is intended to be a prophesy of what every kitchen will have tomorrow.

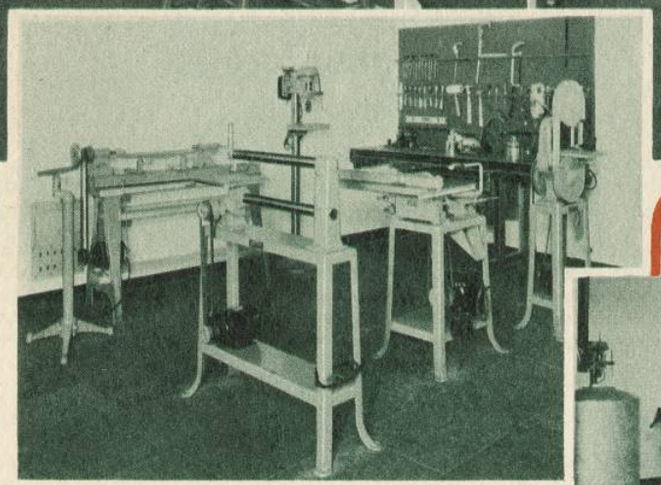
The electric features of this kitchen are unobtrusive—almost to the point of invisibility, in some instances—yet all of them are so selected and placed that they will save the maximum in time and labor. It is all-electric in its showing of range, refrigerator, dish washer, food mixer, waffle iron, griddle, bottle warmer, egg cooker, toaster, ventilating fan, water kettle, clock, percolator, midget clothes washer, and the fuseless meter entrance switch panel shown immediately above the cradle telephone.

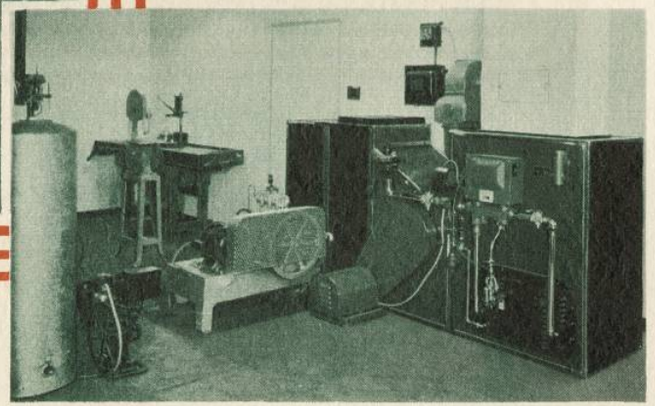


Not one of the fourteen electric lights in this model kitchen is visible, yet these lights give a wealth of glareless and shadowless illumination, either for general use or when special work is to be done at appliances. An entirely new feature is the "strip" of electric outlets that extends along the entire work-table space—a convenience outlet for each foot of its length. A small radio that brings music or home service programs direct to the kitchen, an extension telephone, and an invisible, electric door buzzer, complete the list of permanent electrical equipment.

Contrast between the old and the new is emphasized by the miniature kitchen of earlier days seen in the window. Truly did that kitchen earn the title ". . . workshop of the home."







THE BASEMENT ROOM

*

THERE IS no furnace in the model home basement. Instead there is an air-conditioning unit which controls temperature throughout the year.

And right beside the air-conditioning equipment is a complete modern home laundry, with latest washing machine, cabinet dryer, power ironer and ironing table for hand pressing. Everything is scientifically arranged so as to require the minimum number of steps in performing home laundry tasks. The inner workings of an automatically operated electric hot water heater are indicated by a cleverly built heater section in which varicolored neon tubes picture the action that takes place in heating water.

The space once needed for the furnace and coal bin now becomes the home work shop with lathe, circular saw, jig saw, drill press, all capable of doing a workmanlike job. A clever innovation in the home work shop is a new type of multiple outlet for the connection of such devices as soldering iron, small sanding machine and glue pot. This is in reality an outlet strip running conveniently above the work table in which outlets are placed every ten inches.

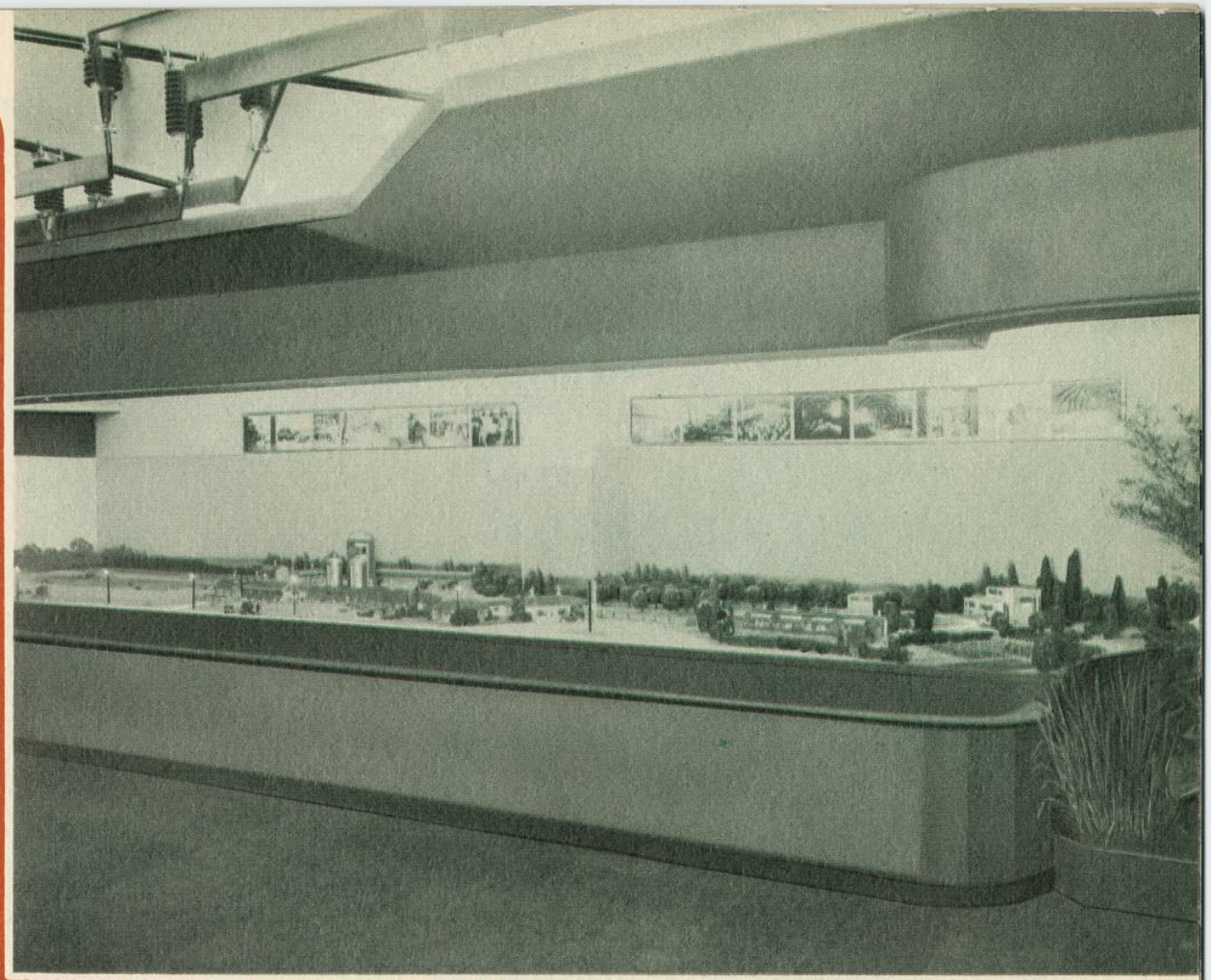
THE FARM DIORAMA

*

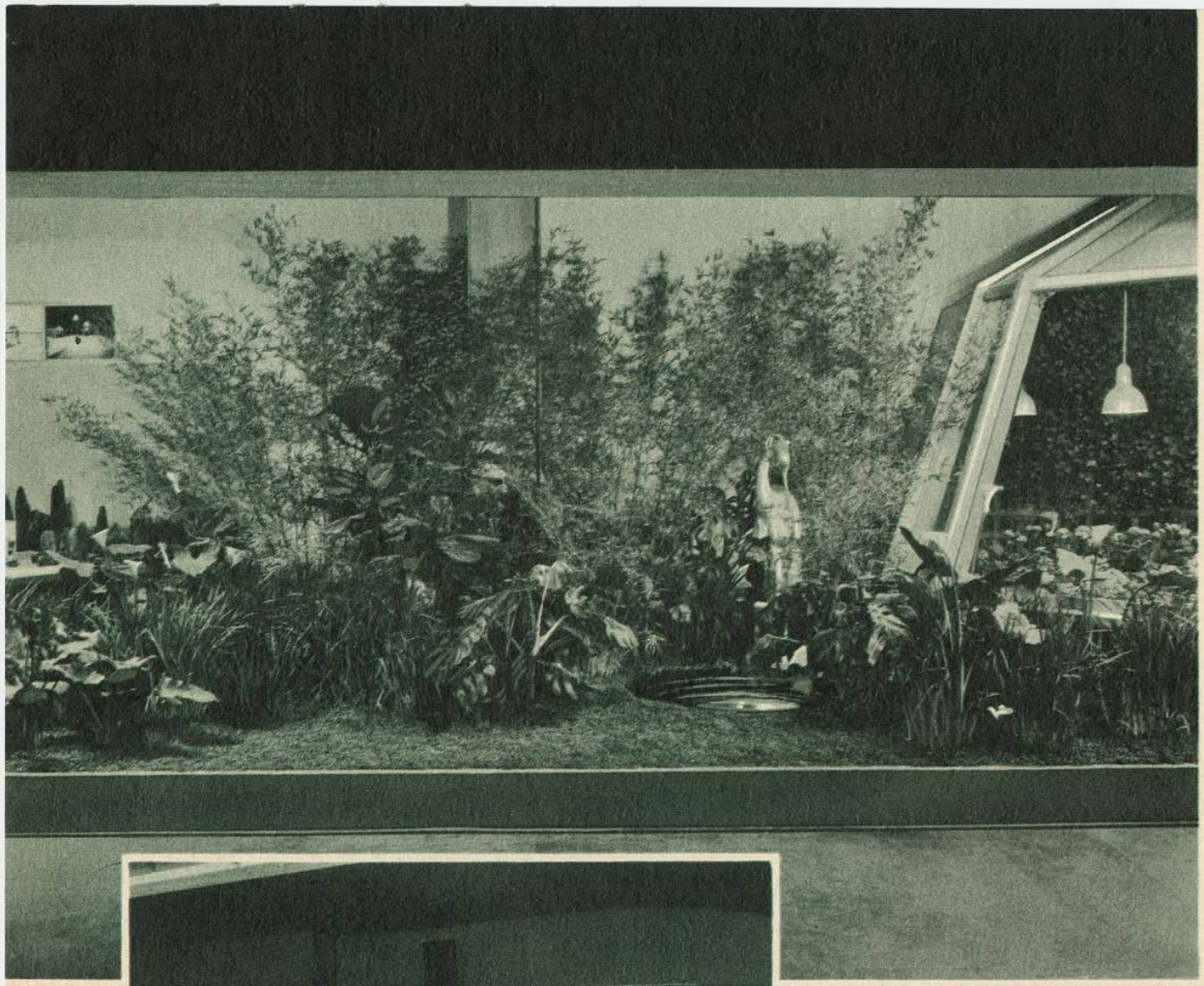
HOW FARMING is being revolutionized by the application of electricity to many tasks formerly done by man and beast is graphically illustrated in the model, thirty-four feet long, of a truly modern farm. The vividness of this display is heightened by day and night lighting cycles, operating on a three or four minute schedule, typifying the changing activities of the twenty-four-hour day.

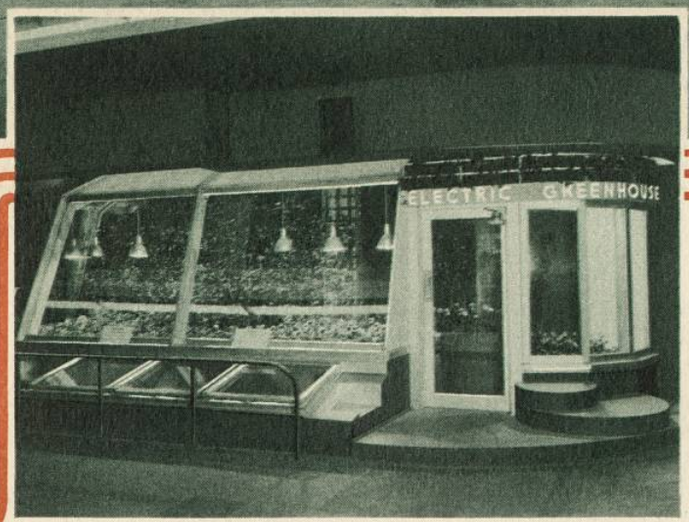
The electric distribution lines on this model farm are underground, eliminating poles which might interfere with field work or mar the beautifully landscaped view. Here one may see how the electric cable plow, dispensing with tractor, makes its way about the field, carrying a self-winding cable, or how the balanced plow shuttles steadily back and forth from cables set close to the ground at each end of the field.

Hens are treated by ultra violet rays and their hours of work and rest controlled by light. Cows are milked—not in the dairy barn—but in a spotless lactary conveniently located at one end of the barn. Cows, moving in at one door of this circular lactary, are first thoroughly washed, then milked with sanitary, efficient electrical equipment, and finally returned to their stanchions by another door. Electric cooling and bottling equipment also is installed in the lactary. Electric conveyor systems are utilized in feeding the live stock.



The many activities of the farm and in the farmhouse which are dependent upon electricity as suggested by the model are more completely explained and visualized by a series of pictures and talking motion pictures which form a background.





IN THIS greenhouse the hotbeds are electrically operated, plants being propagated from seed and from plants under electric light treatment. Although located in a spot remote from the sun, they are kept thriving and healthy through a system of automatically controlled ventilation and a thermostat which turns on artificial sunlight as needed.

THE GARDEN NOOK AND GREENHOUSE

★

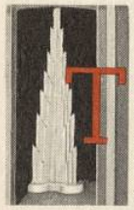
ORNAMENTAL GRASSES, blue iris, a copy of the lovely "White Heron" in plaster, a quiet pool—these are the materials with which a landscape artist has created a beauty spot of distinction, the Garden Nook. This semi-tropical plant composition, with its large-leafed philodendron, bamboo and rubber tree, wins its place in the electrical exhibit because of another medium of artistic expression used by the designer: the electric light which subtly enhances the ornamental effect, at the same time suggesting to visitors the idea of beautifying home gardens during evening hours. An unusual feature of the Garden Nook is the use of electricity for sunshine treatment, to nourish plants in a building lighted entirely by artificial means.

In the modern green house, electricity assists in propagating plants, supplies fresh air, controls temperature, makes up any deficiency in the amount of sunshine, and even electrocutes the insects.

Here is a fascinating spot; vegetables and other plants are growing under glass which admits man-made sunlight. The greenhouse itself, unusual in shape, suggests ideas for design of such structures for private homes and estates.

THE OPERATING ROOM

*

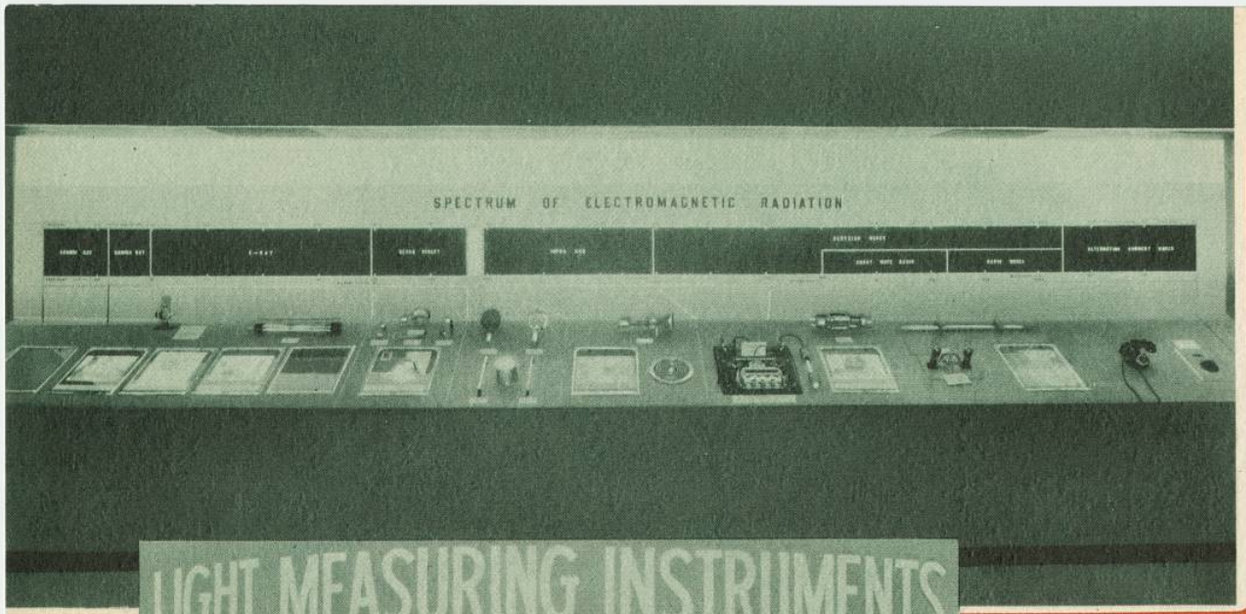


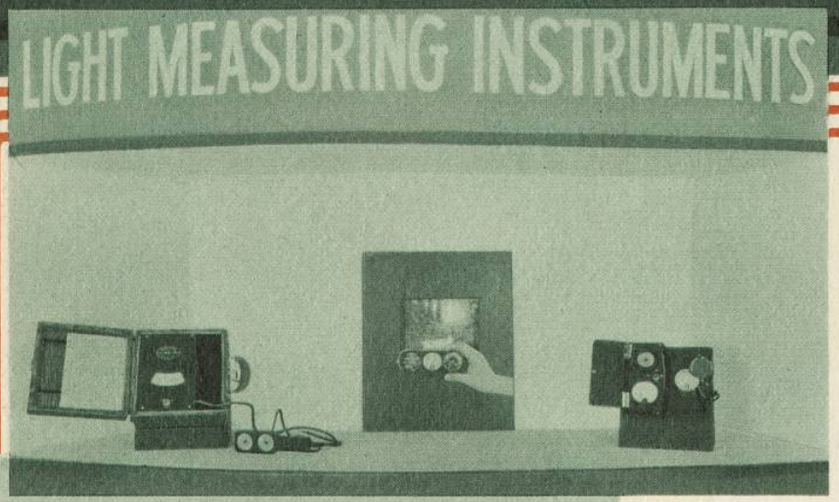
THE MODEL hospital operating room is designed to show the adaptation of electricity's newest ideas to this vital service of humanity. It consists of a dome-shaped room, in which a tense moment in the progress of a difficult operation is being observed by students and internes. Through the combined skill of electrical and architectural experts, the full sized room which this model projects would seat each spectator only twelve feet from the operating table.

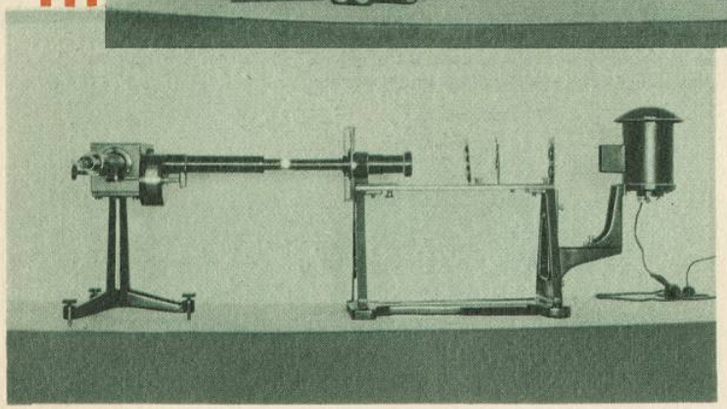
Light is focused upon the operating table from every direction so that any shadow that might be cast by surgeon or attendant is offset by light from the opposite side. The room is ventilated mechanically, scientifically washed air being distributed through disc-shaped inlets near the floor. The operating table is wired for convenience in using electricity and anaesthetic gas is piped through its base. An "electric eye" operates the door of the room; another serves as a soundless nurses' summons. The beautifully patterned floor serves an unusual utilitarian purpose, its design being outlined in grounding metal to prevent any possible spark.

The wall of the room, chiefly for sanitary reasons, adopts the streamline style with no projections, the glassed-in galleries and even the electric lamps being recessed flush with the surface. The room is sound proof and sterile, and while observers hear every word of the lecture by sound amplification, their presence cannot disturb or cause possible infection in the operating area.

To bring out the minute details, the television apparatus reproduces the operation two times its actual size on the wall opposite the balconies. With such equipment some day a busy San Francisco surgeon may actually see and hear any unusual operation performed by a colleague in Baltimore or New York.







TWO exhibits of Light Measuring Instruments are shown in this display. One, the modern photometer, employs a "photronic" cell, a device that turns light directly into electricity. Measuring the electrical output of the cell thus measures the intensity of a light. The other apparatus makes a color analysis of light, breaking it down into its color components. Thus by the one means the quantity is determined and by the other its quality is made known.

SPECTRUM OF ELECTRO-MAGNETIC RADIATION

*

ELECTRIC ENERGY is propagated through space in the form of waves which travel at the speed of light, roughly 186,000 miles per second. The number of waves per second, the frequency, therefore determines the length of any wave. In the diagram which is the major feature of this exhibit, the waves are classified according to, and in the order of their length. It is a characteristic of very long waves that they travel through space only with difficulty and require some kind of conducting material to carry them. But as frequencies become higher and wave lengths shorter the waves travel through space with increasing ease.

The wave length of radiated electricity determines its effect on materials and organisms in its path. Waves of a certain length, for instance, manifest themselves as heat on the objects they strike. Waves of another length are apparent to the eye as light. Others are perceptible in various ways by their effects on different substances and on arrangements devised for their reception. But out of the infinite spectrum of electric waves only the waves of light and heat are perceptible directly by human senses. This display also includes Alpha, Beta, Gamma and X-rays, used in industry and in therapy, broadcasting waves used in radio and other communication manners and long waves used for lighting and for power.

THE SCHOOL ROOM

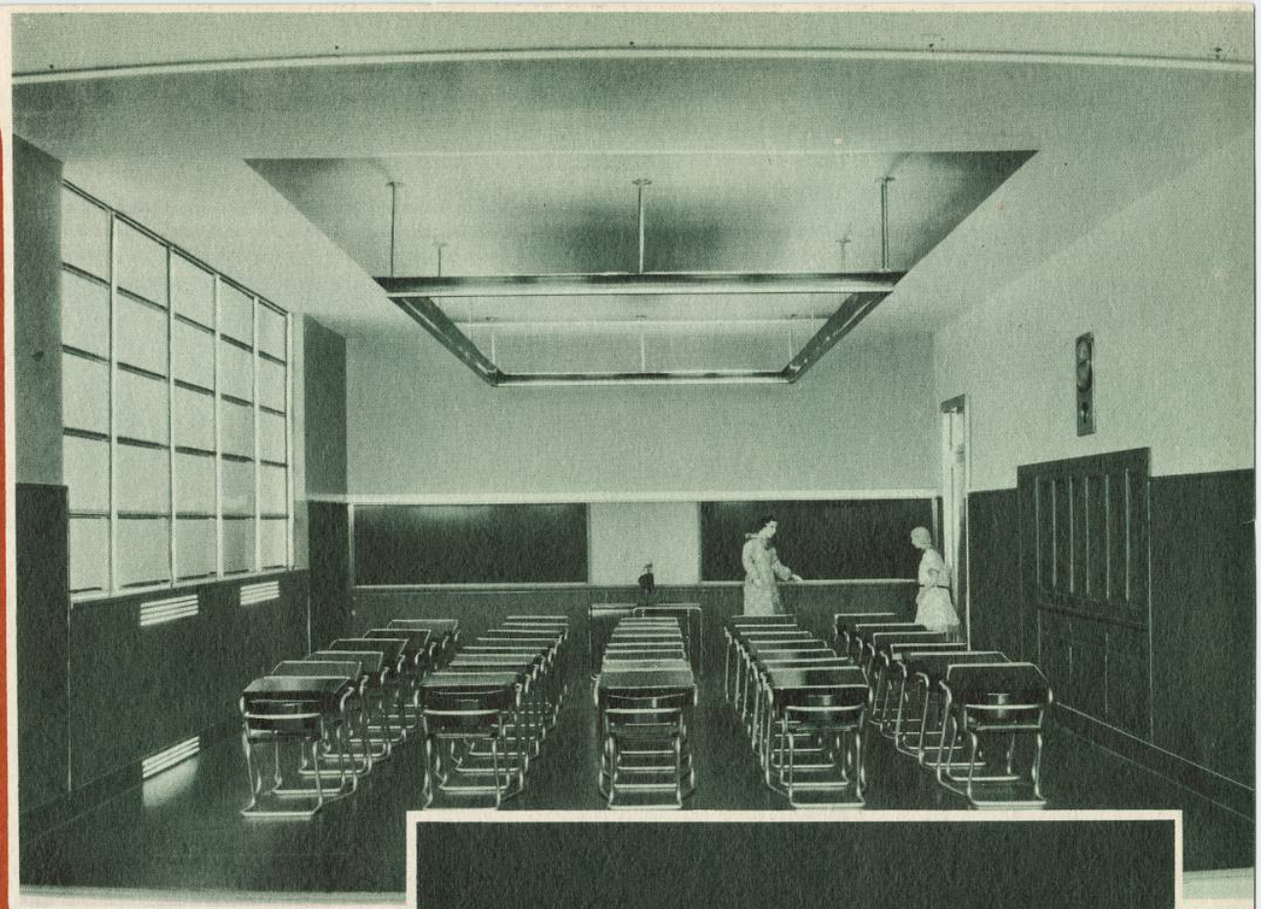
*

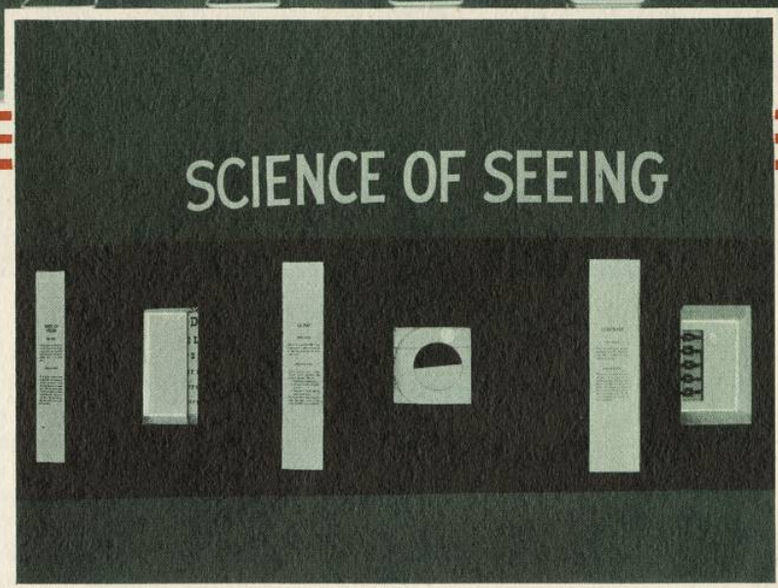
THE MODEL school room represents a startling departure from the little red school house of former years, or even from the so-called modern school rooms of today. It has been designed with the health, safety and comfort of the pupils uppermost in mind. This is a view looking into it from the rear wall.

The broad windows at the left afford natural sunlight as abundantly as it is available, but should any change in the weather occur excitation of a hidden photo electric cell ("the electric eye"), automatically turns on general artificial light within, insuring adequate light constantly. The lighting is indirect, from lamps in a rectangular light trough suspended from the ceiling. Ultra violet health rays are projected in the same way.

Even the air the pupils breathe is washed and maintained at the exact temperature deemed most healthful, the same equipment warming the air, or cooling it, as required, before sending it into the school room.

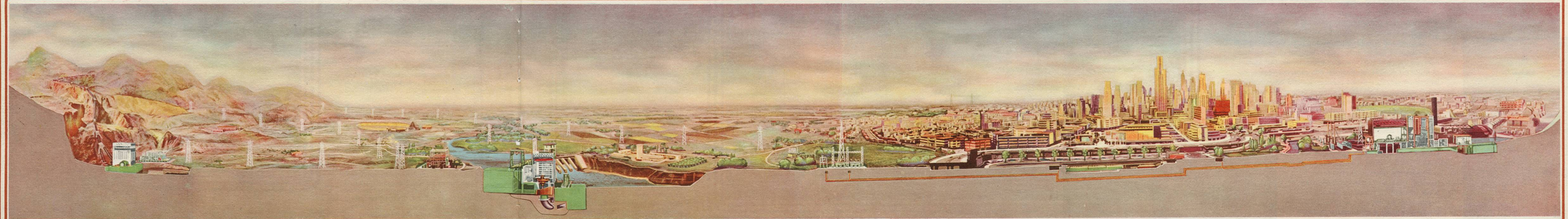
While electricity helps assure the health and comfort of the pupils, it also aids them in their studies. The motion picture projector on the teacher's desk reproduces an image on tomorrow's "blackboard," the screen, and is available for extensive use in the educational functions of the school. A sound film explains the marvels of lighting, heating, treatment with ultra violet health rays and other features.

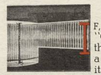




IN THE Science of Seeing display, one demonstration, "Glare," shows the effects of bright or dim light thrown upon an object. Another, called "Contrast," illustrates the effects of change in the amount of light used against varying backgrounds. In the third, "Speed of Vision," letters of the alphabet appear upon a revolving cylinder. Under dim light the cylinder appears to revolve very rapidly so that the letters blur; under bright lighting the revolutions appear slower and the letters are easily read. Actually, the cylinder revolves at fixed speed, the device illustrating the increase in speed of vision under adequate light.

A DIORAMA OF THE GENERATION, TRANSMISSION, DISTRIBUTION AND UTILIZATION OF ELECTRICITY



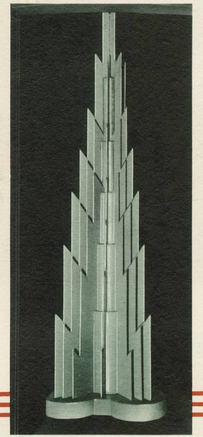


IF, AS IS STATED in the ancient Chinese proverb, "One picture is worth ten thousand words," then this great three-dimensional picture is worth a million, a hundred times as many. For it tells its story, not in the still flatness of a picture, but in form and perspective and with motion and changing light.

Coming down from the water storage lake high up in the mountains is the penstock of a high head hydro plant at the mountain foot. The water rushes down through the penstock with tremendous force to spin the Pelton wheel driving the electric generator whose output is stepped up in the adjacent transformer station for transmission to the places of its use. Tied into the same transmission system is a low head water power plant farther down on the plain. These two plants send the bulk of their output to the city on the right side of the diorama, but some is taken by the mines and quarries of the mountainous region and by the farms of the countryside. It might be assumed that the two water power plants are of sufficient combined capacity to furnish all the electricity needed in the city, but even if this were so, the steam power plant in the city would still be necessary. Water power plants depend for operation on something entirely outside of human control—rainfall. Also it is not wise that the essential services of electricity in city life should rely entirely on transmission of energy from distant points of generation. In a year of light rainfall the available capacity of hydro plants is greatly reduced; a steam plant in the city is necessary to help carry the load. Also, lightning strikes transmission lines and storms damage them; a steam plant in the city is necessary to insure continuity of service.

The city shown in the diorama is different from any now existing. The layout, the buildings and the civic facilities shown are those of a "city of the future" as visualized by today's city planners and architects. The dependence on electricity in such a city as this, as is true in any city of the present day, is tremendous. With a failure of electricity supply, transportation would stop—(did you ever sit in a subway train, even for a minute or so, waiting for the "juice" to come back on?)—elevators in tall buildings would halt where they were—(were you ever caught in an elevator between floors?)—lights would go out and darkness would reign in streets, in stores and in homes. Thanks to the care and foresight employed in the development of electric systems very few people have ever experienced the feeling of helplessness that attends the failure of electricity supply in a large city—or in a small one either.

FLUORESCENCE • MODERN DISPLAY LIGHTING

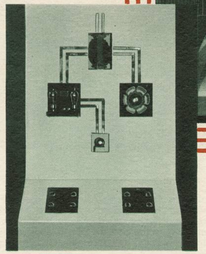


FLUORESCENCE is the property possessed by some bodies of giving off, when illuminated, light of a color differing from their own and from that of the incident light. The light given off is usually of greater wave length than that of the incident light and the violet and ultra violet waves are the best exciters of it. Do not confuse fluorescence with phosphorescence; the latter is an entirely different phenomenon and consists of the actual emission of light whereas fluorescence is the reflection or transmission of it. In effect, fluorescent bodies are able to receive light of one wave length or color and to reflect back or to transmit through themselves light of another wave length or color.

Ultra-violet is invisible. When it is used to excite fluorescence, then is produced the effect which the exhibit at the left illustrates —surfaces that glow in different colors in the dark. The exhibit consists of a revolving tower with vertical planes cut into angular shapes whose turning surfaces catch the invisible ultra-violet and respond with eerie colors.

* *

The exhibit at the extreme right illustrates the use of the Automatic Thyratron Selsyn Control device for the lighting of show windows, stages, and building interiors and exteriors. At right below is the control board for its operation.



THE MODERN beauty shop has an almost bewildering array of equipment dependent upon electricity for correct illumination and operation at greatest efficiency. The spacious lobby in the foreground is approximately semi-circular in shape and lighted indirectly from above by a double cove arrangement, colored neon light coming from one recess and incandescent lamps being concealed in the other. The combination produces a particularly pleasing, softly colored simulation of real daylight. At left and right are large circular mirrors imbedded in the wall in such a way that light flows over the entire surface from each point in the circumference to produce a shadowless yet brilliantly lighted effect both decorative and useful. Beyond each of the mirrors is a show case for the display of cosmetics, the name of the shop appearing above in modern design, fully illuminated.

THE BEAUTY SHOP

*

Five little booths opening off the lobby afford glimpses into completely equipped centers for shampooing, facials, health lamp treatment, permanent waving and hair cutting. Modern heating and ventilating is supplied to the modern beauty shop by air conditioning, a feature sure to become of greater and greater importance in a shop where the service rendered the public necessitates the use of heat for hair drying and permanent waving. The customer sits in a cool and comfortable room, while electric heat focused directly upon her scalp quickly performs its function.

Beauty shop owners and operators find much to interest them in this presentation of the ways electric light and electric heat may be utilized to make their shops attractive to customers and more convenient and thus more economical in their work.

THE SCHOOL ROOM

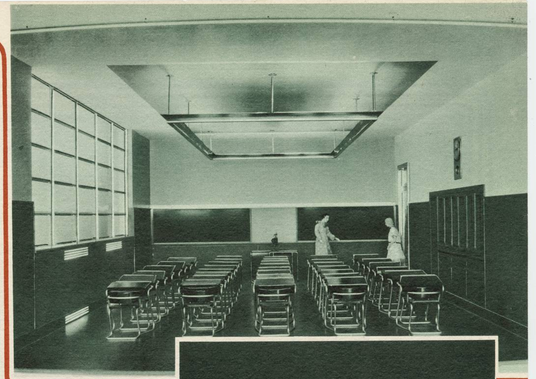
*

THE MODEL school room represents a startling departure from the little red school house of former years, or even from the so-called modern school rooms of today. It has been designed with the health, safety and comfort of the pupils uppermost in mind. This is a view looking into it from the rear wall.

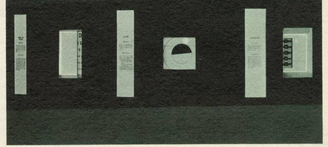
The broad windows at the left afford natural sunlight as abundantly as it is available, but should any change in the weather occur excitation of a hidden photo electric cell ("the electric eye"), automatically turns on general artificial light within, insuring adequate light constantly. The lighting is indirect, from lamps in a rectangular light trough suspended from the ceiling. Ultra violet health rays are projected in the same way.

Even the air the pupils breathe is washed and maintained at the exact temperature deemed most healthful, the same equipment warming the air, or cooling it, as required, before sending it into the school room.

While electricity helps assure the health and comfort of the pupils, it also aids them in their studies. The motion picture projector on the teacher's desk reproduces an image on tomorrow's "blackboard," the screen, and is available for extensive use in the educational functions of the school. A sound film explains the marvels of lighting, heating, treatment with ultra violet health rays and other features.



SCIENCE OF SEEING



IN THE Science of Seeing display, one demonstration, "Glare," shows the effects of bright or dim light thrown upon an object. Another, called "Contrast," illustrates the effects of change in the amount of light used against varying backgrounds. In the third, "Speed of Vision," letters of the alphabet appear upon a revolving cylinder. Under dim light the cylinder appears to revolve very rapidly so that the letters blur; under bright lighting the revolutions appear slower and the letters are easily read. Actually, the cylinder revolves at fixed speed, the device illustrating the increase in speed of vision under adequate light.

THE STORE FRONT

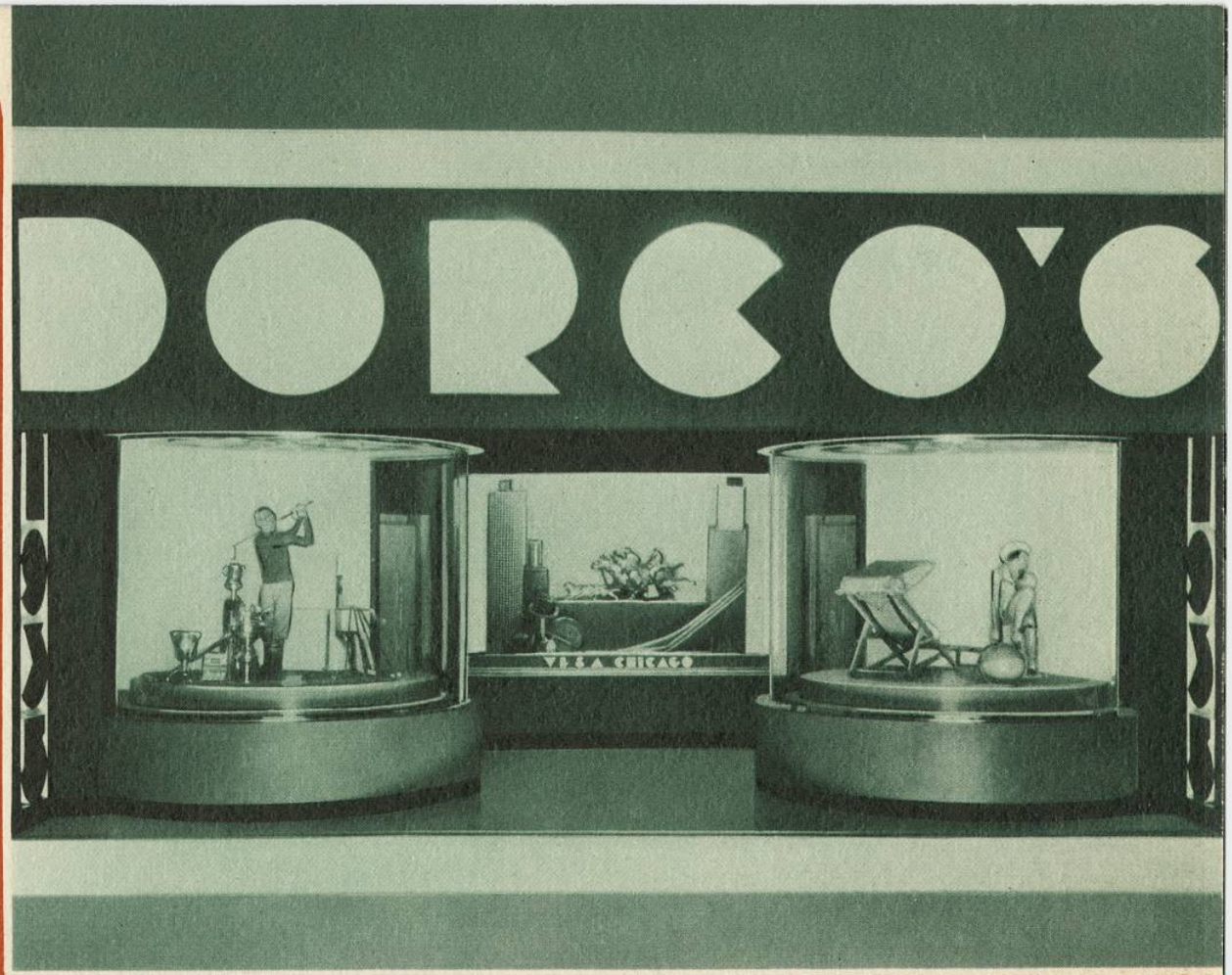
*

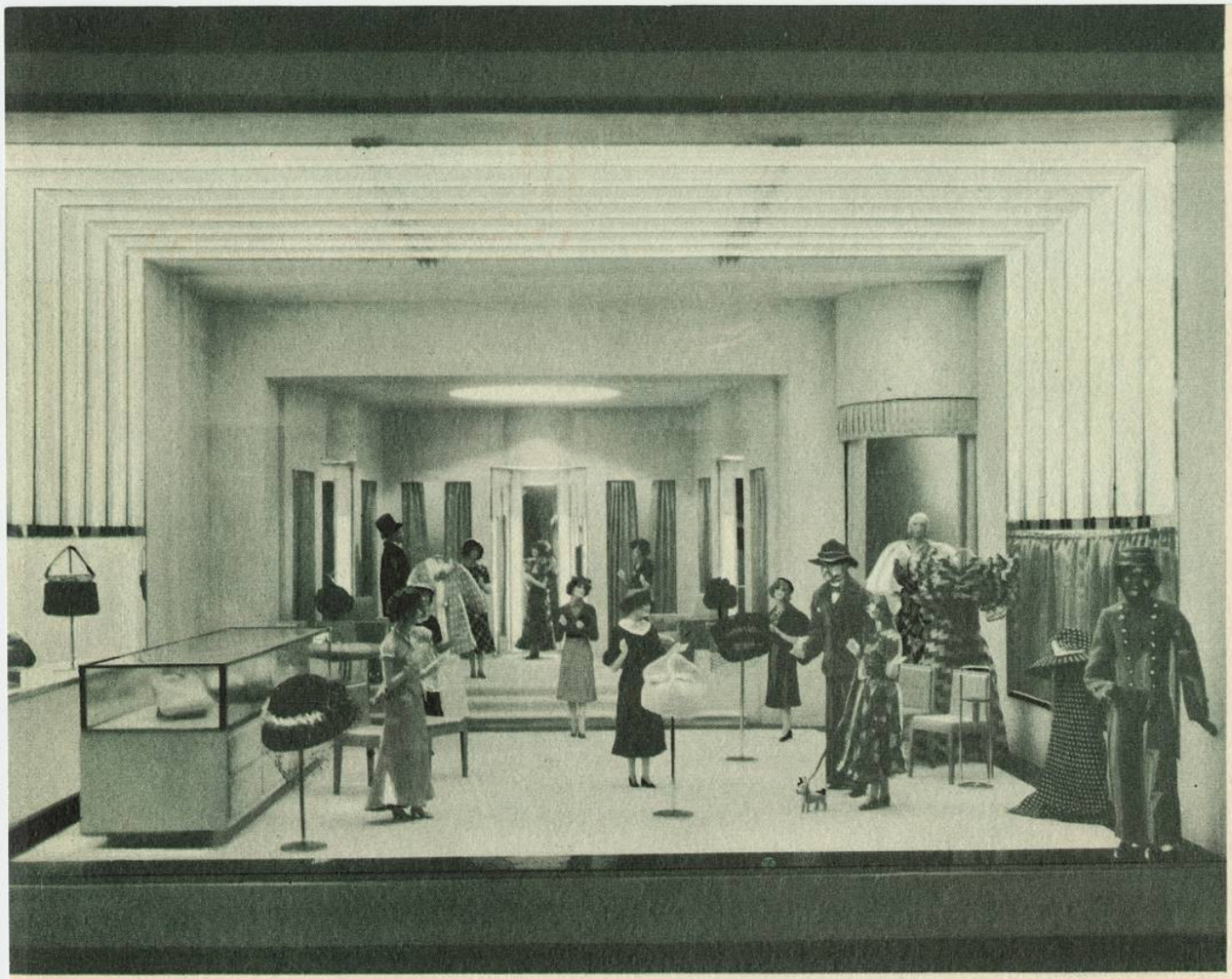
THE MODEL store front brings to merchants the latest ideas in the use of electricity, as a showman, for directing the attention of passers-by to the attractiveness and merit of their merchandise. Above the store front is an electric sign worked out in flashed opal glass against a striking background of black. There are two show windows at right and left of the entrance lobby, and a rear display window with doors leading into the store interior on either side.

The large show windows have actual merchandise on display. Each window demonstrates a different method of adapting the window lighting to the type of merchandise offered for sale, but probably the most novel and effective feature is the fact that the floor of each window revolves constantly, motivated by electricity.

The lighting equipment of the window on the left is so arranged that the plated-ware displayed beneath it picks up and reflects glints of red, amber, blue and green, making a delightful slow-motion merry-go-round of color to invite closer inspection. In the other revolving window, the circular ceiling is evenly divided into three segments, one of amber which gives the effect of sunlight, one of clear glass with incandescent lamps, and the third so constructed as to produce the same effect as north light. Thus, the merchandise moving round beneath the lighting equipment may be seen in three shades, as a dress might be when worn under the varying conditions of light.

The display window at the rear of the lobby demonstrates the value of adequate window lighting, by contrasting with it the inadequacy of the ordinary, dimly lighted window.





THE DRESS SHOP

*

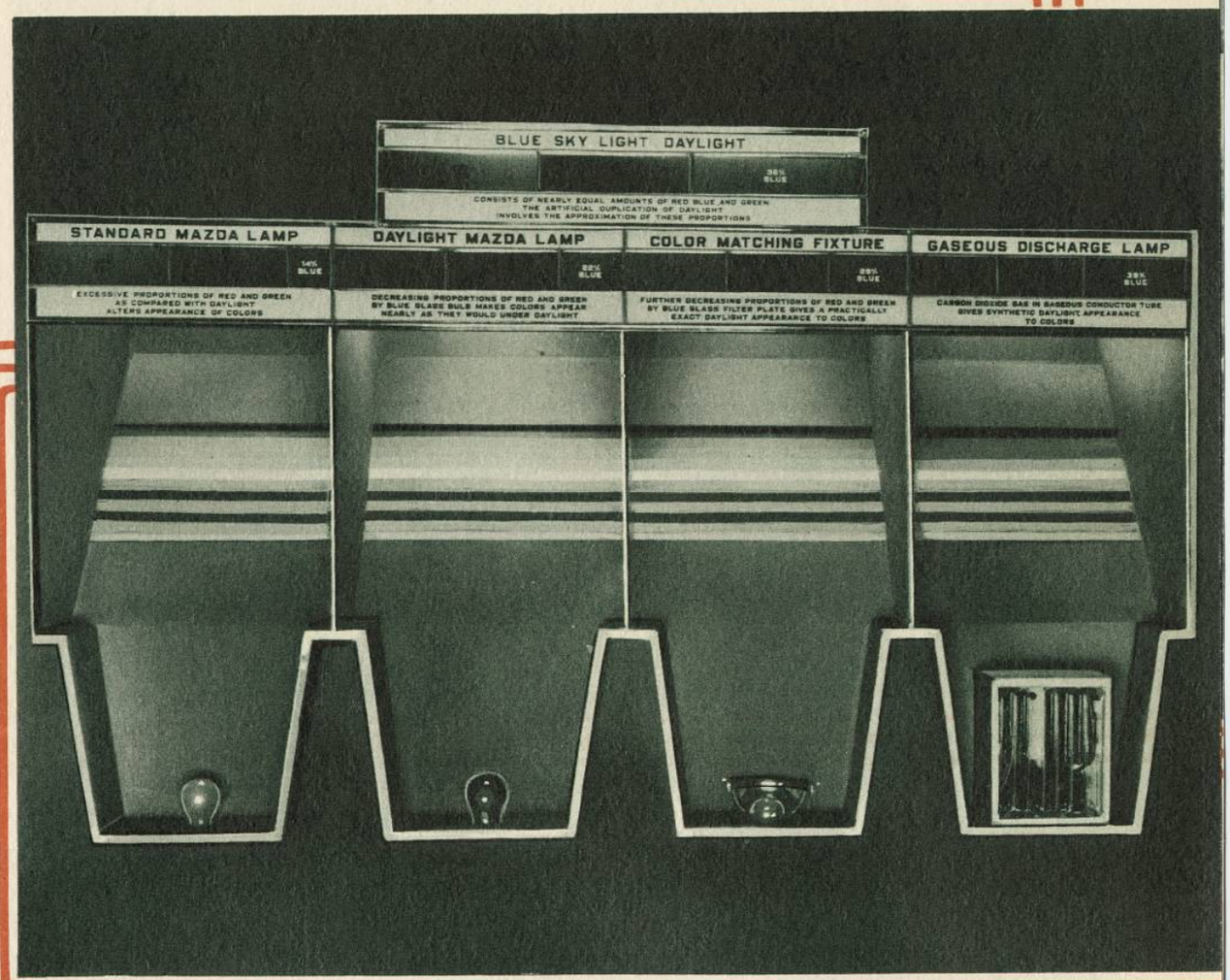
THE MINIATURE dress shop is a gem in the perfection of its appointments; soft lighting, dull white walls, beautiful white carpeting, display cases of crystal effect with chrome. At right and left in the sales foyer, dress cases are recessed in the walls with special lighting focussed upon gowns specially made in miniature size by famous Parisian designers. The foyer lighting is very new—a broad band of softly glowing light extending upward from one of the display cases, across the ceiling and down to the other case, and diffusing a particularly pleasing light over the entire salesroom. However, the chief interest is focussed upon a tiny stage which occupies one corner of the foyer for here is to be found a continuous style show, in which doll-sized mannequins appear in turn at half-minute intervals to show the modes of the moment. The style show works automatically, and a spotlight is thrown on each model while white velvet draperies open and close for each appearance.

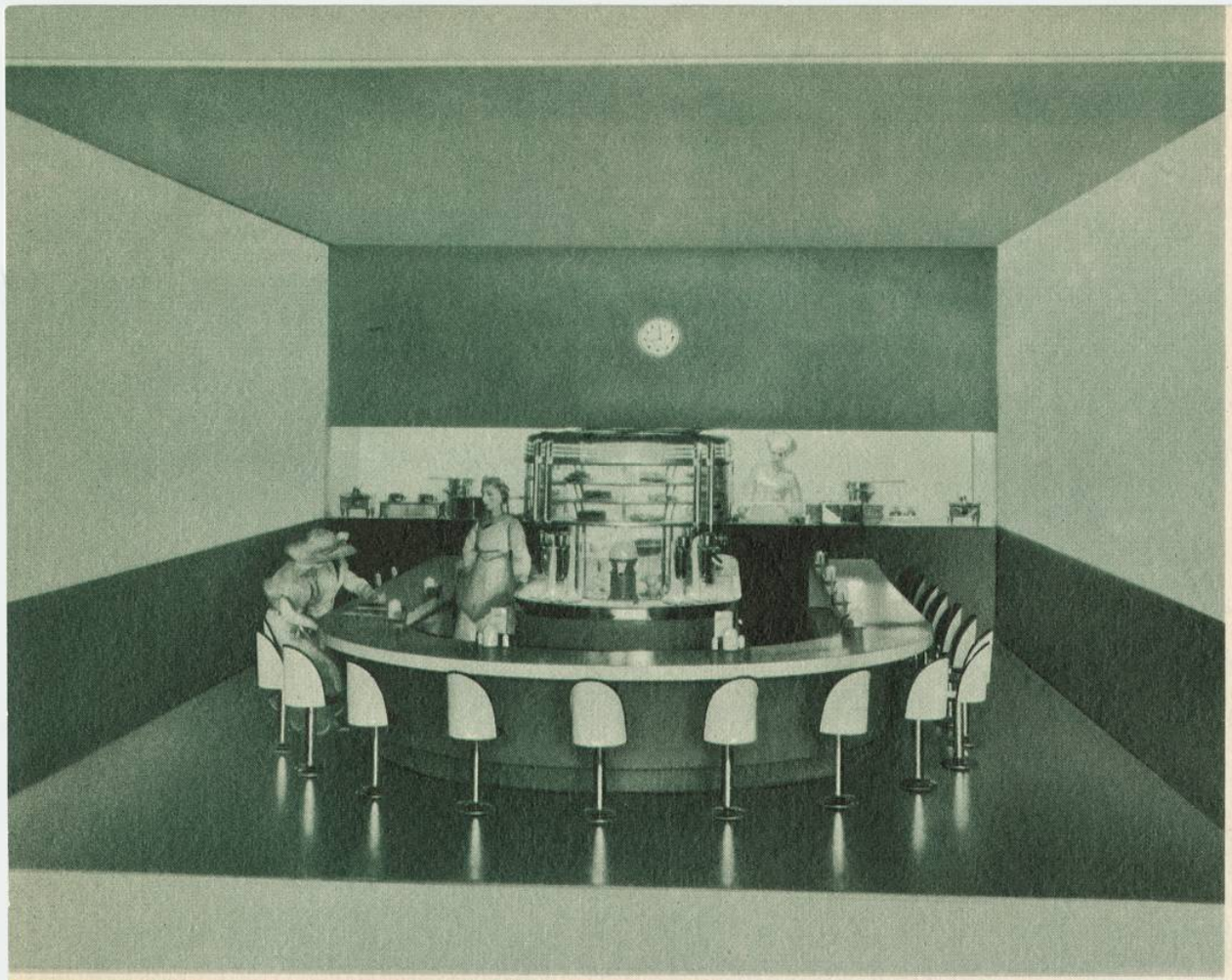
In the slightly elevated rear portion of the store, one sees on either side perfectly appointed dressing rooms adequately illuminated indirectly. Across the back wall are a series of mirrors, the real salesmen of the store, the mirrors which make it possible for the customer to see herself under perfect lighting. Columns of soft non-glaring light rise to shoulder height at each corner of the triplicate mirrors while other light from overhead prevents any chance of shadows. This dual lighting arrangement makes a perfect blending and assures accuracy of vision.

COLOR MATCHING

*

IN THIS color matching display a band of eleven different colors passes beneath various kinds of artificial light, which are the closest possible approach to daylight. These lights are designated as the Standard Mazda Lamp, having excessive proportions of red and green as compared with daylight, which alters the appearance of colors; the Daylight Mazda Lamp, with decreasing proportions of red and green by blue glass bulb, makes colors appear almost as they would under daylight; the Color Matching Fixture, with further decreasing proportions of red and green by blue glass filter plate, which gives virtually an exact daylight appearance to colors; the Gaseous Discharge Lamp, wherein carbon dioxide gas in a gaseous conductor tube gives a synthetic daylight appearance to colors. This equipment has many useful color sorting as well as color matching processes for stores, paint shops and numerous industrial uses.





THE MODERN RESTAURANT

*

THIS MODEL restaurant is designed to show the newest ideas in lighting, air-conditioning, food storage, refrigeration, and kitchen equipment. Restaurant-type waffle irons, steam tables and food show cases that you could hold on your palm, tiny pivoting chairs of black enamel and chrome, doll-size refrigerators with glass fronts displaying the tempting melons and desserts—every detail of a complete and ultra-modern restaurant, all has been specially built to scale, even the chef, waitresses and customers are there.

This little restaurant has a fifty-seat capacity, chairs being arranged about a U-shaped counter. In the center are food storage cabinets—refrigeration units and electrically warmed ovens for hot breads—and above this equipment, but concealed, is a restaurant lighting system that is progress itself. It casts an even white light upon the counter so that each guest has plenty of shadowless light on his food without the slightest glare in his eyes. From the same concealed source light rises to play in restful, changing colored patterns on the entire ceiling of the room. The same lighting equipment which soothes the visitor and bespeaks the up-to-date-ness of the restaurateur also shows all foods in their tempting natural colors.

Across the rear of the model restaurant is the model electric grill or kitchen where food is prepared behind a service counter in full view of customers. Yet due to the proper design and the installation of electric air-conditioning, guests would be cool, comfortable, and unbothered by cooking odors.

THE BAKERY SHOP

*

ELECTRICITY SERVES the bake-shop! Tiny loaves of bread, pies, cookies, buns, everyday cakes and even towering wedding cakes, specially baked by a famous chef, are arranged in tempting array in cases and on counters under cleverly designed lighting equipment.

The general lighting is of the indirect cove type, diffusing even and adequate light to every corner. The counters, modern in design with their chrome trim, are double-decked affairs. The upper level is lighted brilliantly from rows of lamps directly above, but recessed and concealed in the ceiling; the lower level is flood-lighted from show-case fixtures. This system makes the upper counter the focal point of attention on entering the store, but gives adequate light to every other part of the food display.

The bread case recessed in one wall of the shop, and two oval cake niches in the opposite wall, are illumined attractively by a diffusion of light coming from the side walls of the cases.

On the back wall, opposite the entrance, is a dioramic panel affording a glimpse into a modern bakery shop equipped with the latest electrical shop equipment.

And the shop is electrically ventilated, with automatic control of temperature. In short, this model bakery is so complete and so convincing that one imagines the pleasant odors of fresh baked breads.

THE GROCERY STORE

*

THIS MODERN grocery store in which electric illumination not only floods the shelves with soft and pleasant light, but also indexes the various food departments for the convenience of customers in finding quickly what they want, has been built in one-quarter regular size. It uses electricity for lighting, for refrigerated storage of perishable foods, for maintaining comfortable room temperature automatically, whether the outside weather is torrid or sub-zero, and for heightening display effects and advertising the quality and cleanliness of the goods offered for sale.

Lighting is indirect, from ledges recessed in the ceiling, so that every part of the store is bright as day. Additional lights are concealed in a sort of glass joist which runs the entire length of the store, projecting out above the top shelf, so that light floods down from it over the shelves and forward from it, illuminating the plainly lettered announcement of kinds of food found in each section of shelving.

At the rear are the brightly lighted refrigerated cabinets behind service counters, display counters and vegetable and fruit display fixtures, each properly arranged for convenience. The arrangement and lighting will also suggest ways of spotlighting special merchandising features to which the merchant may wish to call particular attention. Every article, from cash register to white-aproned attendants, has been painstakingly worked out in exact scale to portray an up-to-tomorrow modern grocery store, in which electric light serves as the animating factor.

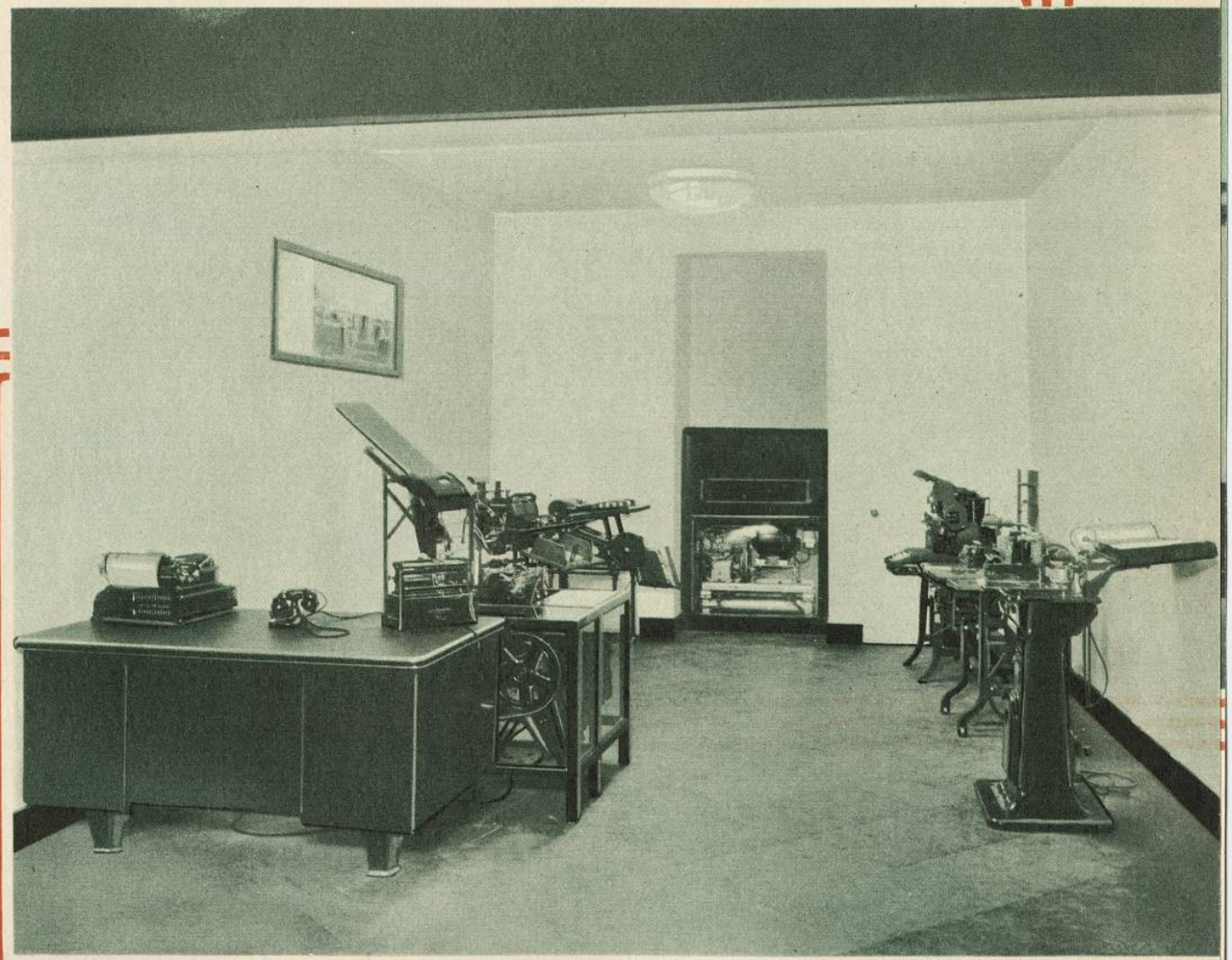
OFFICE DISPLAY

*

EMBODYING the latest ideas in the use of electricity in the really efficient business office, a model office having indirect illumination combined with ultra violet ray treatment, and equipped with an interesting variety of new-type business machines, is displayed here.

The novel idea of treating office workers with violet ray as they work is declared to be a sound economy in prevention of lost time and efficiency as well as from colds and other infection.

The stenographer in this modern office need merely touch the keys of her electrically operated typewriter, which is provided with a choice of styles and sizes of type and is even capable of adjustment of spacing. Built into an adjacent desk is another typewriter on which the operator types a letter stencil, then pushes a button and leaves it to reproduce the letter in perfect typing with only occasional attention from her. Another machine sets type from which a companion machine makes rapid reproductions. The latest equipment for folding and inserting letters, addressing envelopes, sealing, and stamping mail, all of it requiring the use of electricity for maximum speed and efficiency, is to be found in this exhibit.



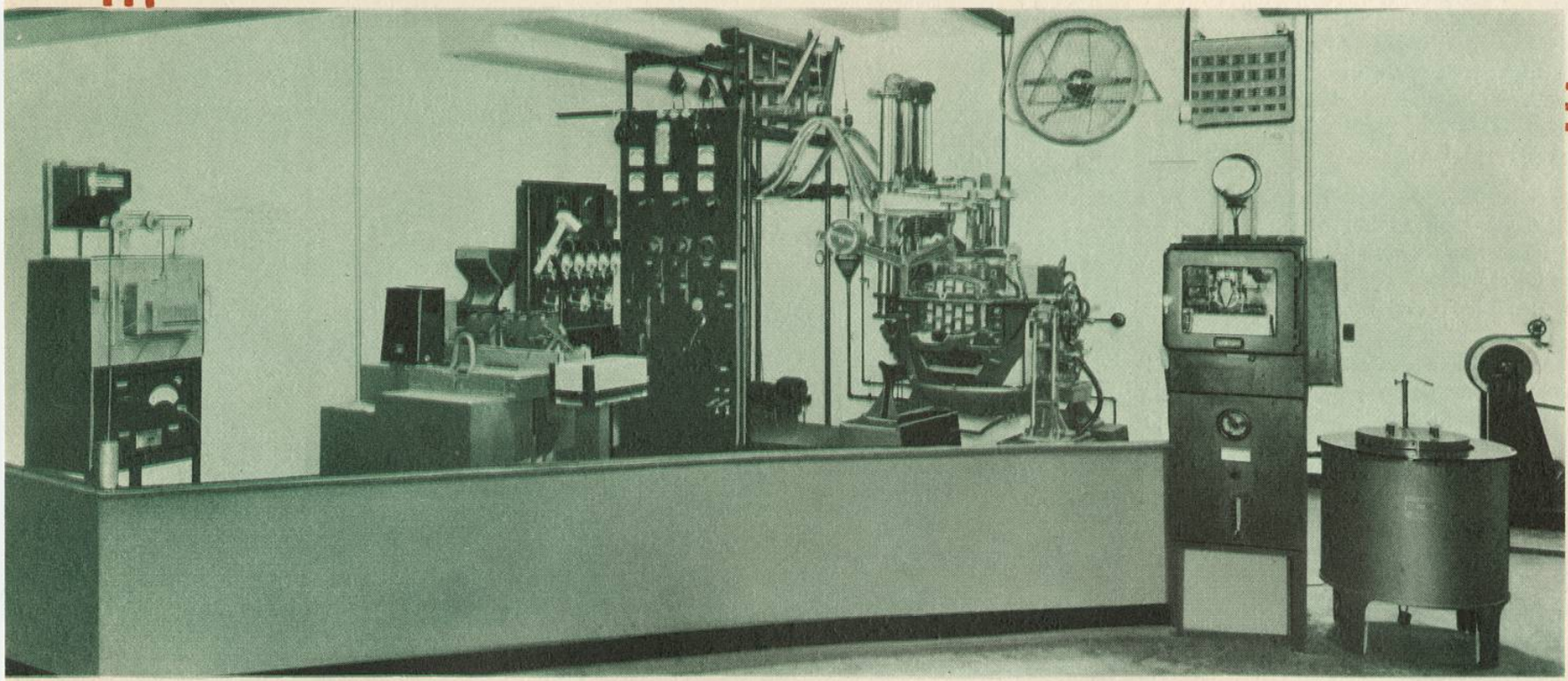
INDUSTRIAL ELECTRIC HEAT APPLICATIONS

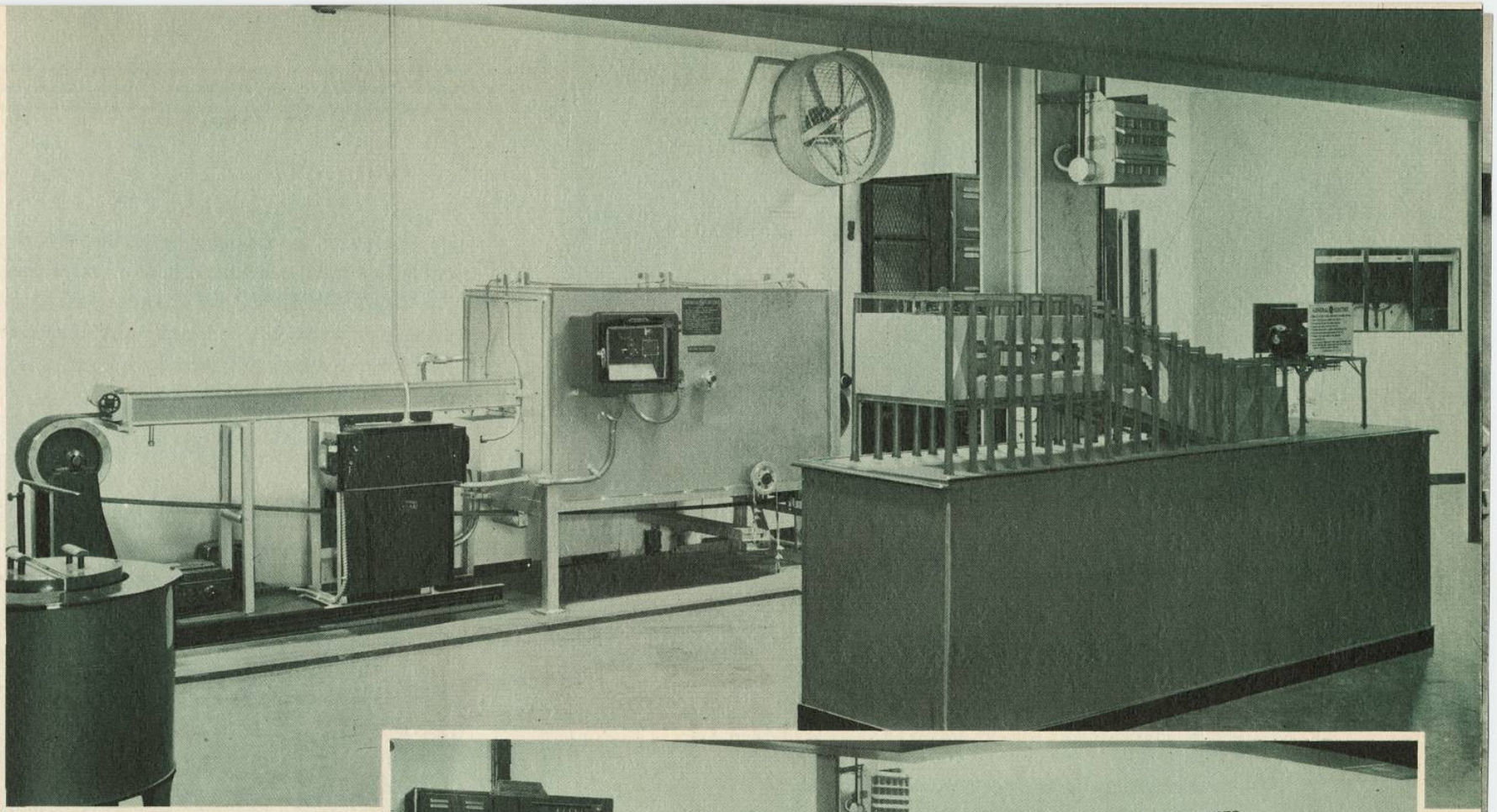
* * *

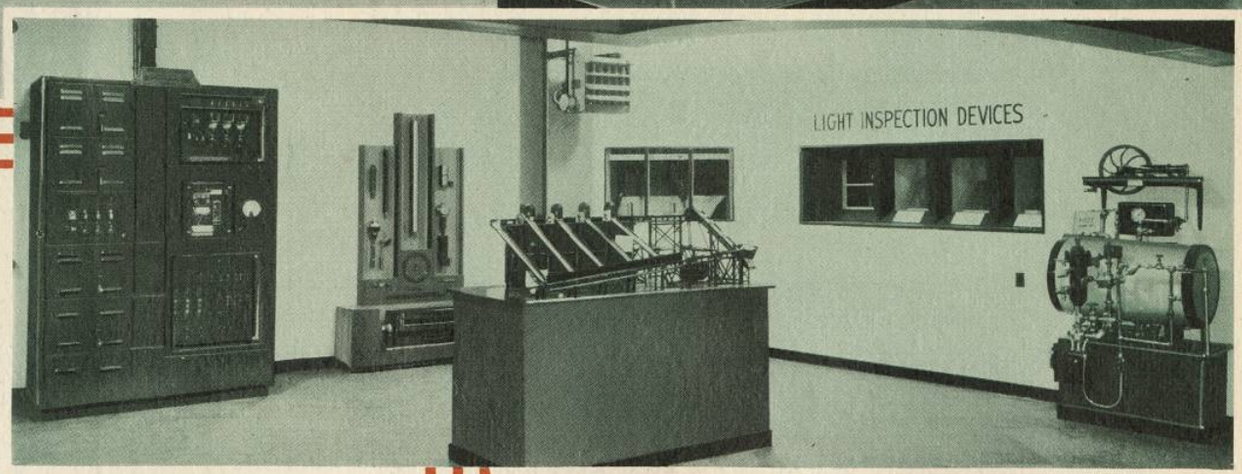
PREDOMINANCE IN this display is given to applications of electric heat in industry because electric power as the driver of machines is familiar to all. Heat applications of electricity are not so well known nor in so common use, but they represent a factor in industry that is growing rapidly and will have great effect in the near future on the quality and cost of manufactured products of all kinds.

By heating metal parts in an electric furnace in a controlled atmosphere of certain gaseous constituency, their surfaces can be made so hard as to defy the scratch of a diamond. In the past few years there has been a great increase in the application of porcelain enameled steel to many uses—we may see it soon as siding for houses—largely due to the electric enameling furnace.

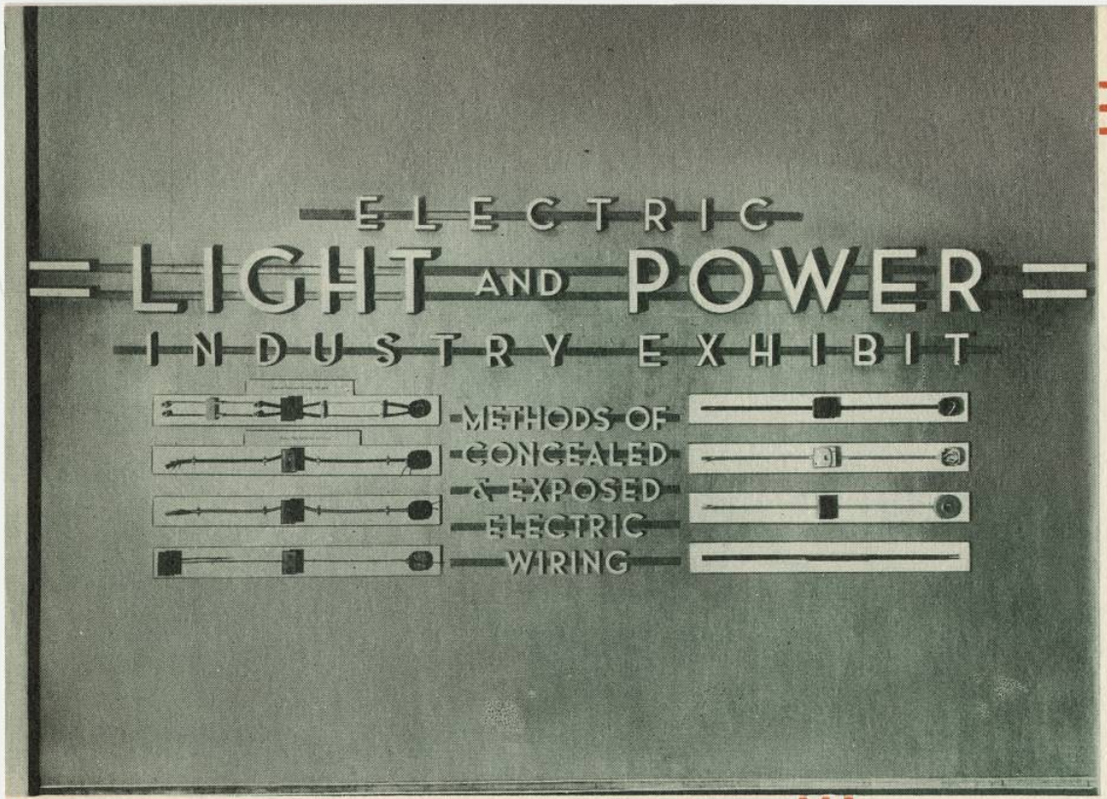
All of the present value and all of the future







value, of electric heat in industry is based upon three characteristics, which are: that electric heat is heat without combustion and therefore is absolutely clean and may be used in locations where fire is impossible or undesirable; that it is perfectly flexible and may be applied where it is needed and nowhere else; that it is controllable to a degree impossible to other means of heat applications.

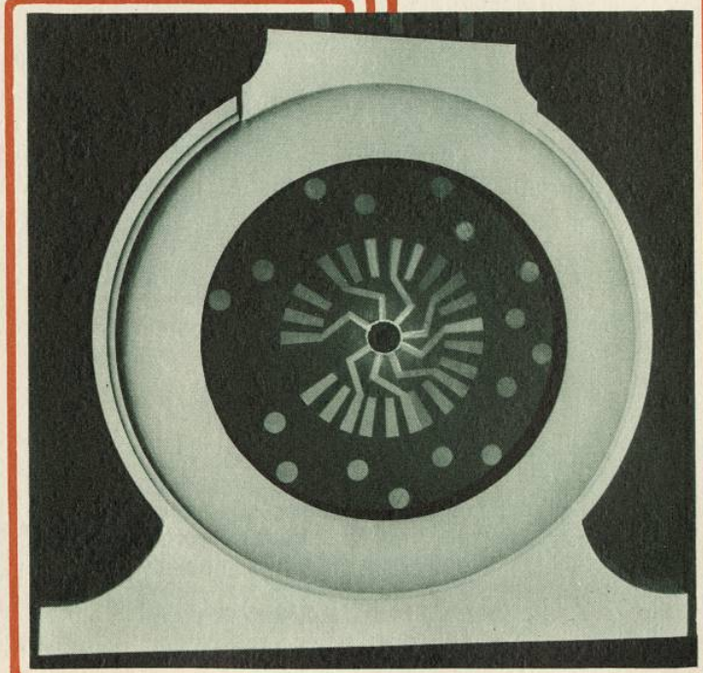


THE STROBOSCOPE

*

THE STROBOSCOPE is practically applied to study motion too rapid for the eye to follow. To the initiate a Stroboscope is capable of putting light flashes into synchronization with moving parts for study of their operation. To the visitor it is a large and striking looking black disc on which white balls and bars dance queer antics and the fascinating thing is that you are told these dances do not take place, you just think they do. The Stroboscope, however, isn't just a bit of optical illusion for one's amusement, for it also has its sterner moments. For example, if one wanted to keep an eye on a certain rivet-head on a rapidly revolving wheel, the Stroboscope could be tuned in, synchronizing it to the speed of the wheel revolutions, and thereby make the wheel appear to stand still, or make yourself believe you had made it stand still because all you would see would be the chosen rivet-head.

* *



ELECTRICITY AT WORK

THE EXHIBIT OF THE ELECTRIC LIGHT AND POWER INDUSTRY

* * *

GENERAL COMMITTEE

CHAIRMAN, E. W. LLOYD
Commonwealth Edison Company
Chicago

D. C. BARNES
Engineers Public Service Company, Inc.
New York

D. C. GREEN
Electric Bond and Share Company
New York

R. J. GRAF
Byllesby Engineering and Management Corporation
Chicago

T. A. KENNEY
Commonwealth and Southern Corporation
New York

COL. WILLIAM KELLY
Buffalo Niagara and Eastern Power Company
Buffalo

LOUIS H. EGAN
Union Electric Light and Power Company
St. Louis

CLARENCE L. LAW
New York Edison Company
New York

*

* * *

PUBLICITY COMMITTEE

CHAIRMAN, W. H. HODGE
Byllesby Engineering and Management Corporation
Chicago

Vice-Chairman, J. W. HICKS
Byllesby Engineering and Management Corporation
Chicago

ELL C. BENNETT
Bennett-Watts-Heywood Company
Chicago

E. FRANK GARDINER
Midland United Company
Chicago

W. H. CULVER
Commonwealth Edison Company
Chicago

FRANK R. INNES
Electrical World
Chicago

J. R. PERSHALL
Public Service Company of Northern Illinois
Chicago

ACKNOWLEDGMENT

From the following named companies, associations and individuals ELECTRICITY AT WORK received a wholehearted and much appreciated co-operation. They loaned and donated equipments, supplied models of their products and gave expert advice and supervision to the design of the exhibit.

* * *

A. & B. STOVE CO.
Electric Range
A. & M. KAVAGHEUSIAN, INC.
Carpets
ART INSTITUTE OF LIGHT
Wilfred Clavilux Color Instrument
ACME ENGINEERS, INC.
Hair Dryer
ADDRESSOGRAPH MULTIGRAPH CO.
Graphotype, Addressograph, Printing, Multigraph, Folder
AIRMASTER CORPORATION
Basement and Kitchen Ventilating Equipment
ALLEN-SHERMAN HOFF CO.
Ash and Dust Handling Equipment
ALLIS-CHALMERS MFG. CO.
Turbine Model
ALTORFER BROTHERS
Home Laundry Equipment
ALUMINUM COMPANY OF AMERICA
Stroboscope, Stair Head
AMERICAN BLOWER CORP.
Blower
AMERICAN BRASS COMPANY
Copper
AMERICAN CAR & FOUNDRY CO.
Automatic Rod Heating Machine
AMERICAN ELECTRIC HEATER CO.
Soldering Iron
AMERICAN FOUNDRY EQUIP. CO.
Industrial Air Heaters
AMERICAN SLICING MACHINE CO.
Model of Slicing Machine
AMERICAN STEEL & WIRE CO.
Farm Fence and Gates
ANACONDA COPPER COMPANY
Copper Bus Bar
C. J. ANDERSON COMPANY
Solenoids
ANGELUS CAMPFIRE COMPANY
Grocery Display Models
APEX ROTAREX CORP.
Washing Machine
ARMAN PET SHOP
Aquarium
ACHESON GRAPHITE COMPANY
Electrodes for Steel Melting Furnace
ART METAL MFG. COMPANY
Furniture and Desks
ATLAS BREWING COMPANY
Grocery Display Models
M. B. AUSTIN COMPANY
Fittings and Cable
AMERICAN AUTOMATIC TYPEWRITER CO.
Auto-Typist Duplicator
B. T. BABBITT CO.
Grocery Display Models
BABCOCK & WILCOX CO.
Model Boiler & Pulverizer, Fuel Equipment, Air Preheaters
BALL, GEO. J.—FLORIST
Assistance in Greenhouse Display
BARBER COLEMAN COMPANY
Curtain Track and Equipment
BAUSCH AND LOMB COMPANY
Spectro-photometer
BEERSMAN, CHARLES G.
Architect
C. S. BELL COMPANY
Feed Grinder
BELL & HOWELL COMPANY
Projection Equipment
BENJAMIN ELECTRIC MFG. CO.
Glassteel Diffusers, Reflectors, Sockets
BIGELOW COMPANY
Steam Generator
BLACK & DECKER CO.
Cinderella Baby Washer
BLANCHARD BROS. & LANE
Leather Upholstery Materials
BLUMS VOGUE, INC.
Furnishings for Dress Shop
BON AMI COMPANY, INC.
Grocery Display Models
BUFFALO FORGE COMPANY
Draft Fans for Diorama
BULLDOG ELECTRIC CO.
Wiring Duct
BURDICK CORPORATION
Electrical Bath Cabinet Model
CALIFORNIA FRUIT GROWERS EXCH.
Juice Extractors
CAMPBELL SOUP COMPANY
Grocery Display Models
CANADA DRY GINGER ALE CO.
Grocery Display Models
JOHN B. CANEPA COMPANY
Grocery Display Models
CANTON CLOTHES DRYER CO.
Electric Clothes Dryer
CARRIER ENGINEERING CORP.
Air Conditioning Equipment
CENTRAL SCIENTIFIC COMPANY
Spectrum Layout
CHAMPION PNEUMATIC MACH. CO.
Air Compressor
CHICAGO ART MARBLE CO.
Terrazo Floor of Hospital Model
CHICAGO AUTO. CONVEYOR CO.
Industrial Conveyor Model
CHICAGO FLEXIBLE SHAFT CO.
Electric Appliances
CHICAGO LIGHTING INSTITUTE
Eye Conservation, Science of Seeing, Spectrum Displays, Sound and Circuit Synchronizing
CHICAGO PUMP CO.
Pumps
CLIMALENE COMPANY
Grocery Display Models
CLINTON CARPET CO.
Ozite Carpet Lining
COLTS PATENT FIRE ARMS MFG. CO.
Meter Fitting and Safety Switches
CONLON CORPORATION
Cabinet Ironer
CONTINENTAL DIAMOND FIBRE CO.
Delecto Material
CONOVER DISH WASHER CO.
Dishwasher
COLONIAL PREMIERE CO.
Lamp for Living Room
CONSOLIDATED CAR HEATING CO.
Electric Soil Sterilizer
COPPES BROS. & ZOOK INC.
Kitchen Cabinets
COPPER & BRASS RESEARCH ASSN.
Copper Bus Bar
CRANE CO.
Plumbing Fixtures and Gate Valves for Diorama
THE CRAWFORD McGREGOR & COMBY CO.
Golf Clubs
CRESCENT MFG. COMPANY
Grocery Display Models
CUDAHY PACKING COMPANY
Grocery Display Models
CURTIS LIGHTING, INC.
Show Window Reflectors and Fittings and Diorama Lighting
R. B. DAVIS SALES CO.
Grocery Display Models
STUART DAVIS, Y. KUNIOSHI, GEO. LEWIS
Lithographs
CHAS. De HAVEN
Thermopane Insulation Glass
DeLAVAL STEAM TURBINE CO.
DeLaval Model
DELTA MFG. COMPANY
Motor-driven Tools
DELTA STAR ELECTRIC COMPANY
Bus Supports and Insulators
DONALD DESKEY
Designer of Furniture
DOWNTOWN GALLERIES
Sculpture and Pictures
DICTAPHONE CORPORATION
Dictaphone

DRACKET CHEMICAL SALES CO.
Grocery Display Models

DuPONT RAYON CO.
Material for Curtains

EASTMAN KODAK CO.
Lithograph Frames

EDISON GENERAL ELECTRIC APPLIANCE CO.
Heating Units and Appliances, Electric Range

ELAM MILLS
Grocery Display Models

ELECTRIC ASSOCIATION
Assistance on School Model

ELECTRIC BOX & SWITCHBOARD CO.
Copper Highway Equipment

ELECTRIC STORAGE BATTERY CO.
Storage Battery Locomotive

ELECTRO-ACOUSTIC PRODUCTS CO.
Phonograph, Speaker and Amplifier

ELECTRO-MATIC TYPEWRITER CO.
Electric Typewriter

ELECTROPURE SALES CORP.
Milk Sterilizer

ESCO CABINET COMPANY
Electric Dairy Sterilizer

FAIRCHILD BROS.
Grocery Display Models

FEDERAL ELECTRIC COMPANY
Neon Tube Lighting

FEDERAL STEEL SASH CO.
Steel Sash

FELS NAPTHA SOAP COMPANY
Grocery Display Models

ERNEST FIENE
Large Painting

FITZPATRICK BROS.
Grocery Display Models

O. C. FOSTER
Construction Supervision

FOSTER-WHEELER CORPORATION
Steam Power Plant Condensing Equipment for Diorama

FRIGIDAIRE
Refrigerator

WM. GAERTNER SCIENTIFIC CORP.
Spectrometer

GARDEN CITY PLATING MFG. CO.
Reflectors and Fittings

GENERAL ELECTRIC COMPANY
Thyratron, Hot Bed and Industrial Equipment, Voltage Regulator, Steam Turbine Model and Refrigerator, Sun Lamps

G. E. VAPOR LAMP CO.
Mercury Vapor Tube for Voight Fixture

G. E. X-RAY CORPORATION
Spectrum Equipment

GIBBS & COMPANY
Beauty Parlor Equipment

GILL GLASS COMPANY
Lighting Fixtures

GLASCO PRODUCTS CO.
Medical & Surgical Supplies

G. M. LABORATORIES, INC.
Photo-Electric Control

GOLD DUST CORPORATION
Grocery Display Models

GOLD MEDAL FLOUR, INC.
Grocery Display Models

GOLD MEDAL FOLDING FURN. CO.
Beach Chair Model

GOODRICH ELECTRIC CO.
Reflectors

GORTON PEW FISHERIES CO.
Grocery Display Models

GREENPOINT BRASS & BRONZE CO.
Metal Table

GRIGSBY-GRUNOW CO.
Refrigerator

GRISWOLD MANUFACTURING CO.
Waffle Baker

HARBISON WALKER CO.
Firebrick for Steel Melting Furnace

HARTZELL PROPELLOR FAN CO.
Industrial Fans

HAMILTON-BEACH MFG. COMPANY
Model Drink Mixers

HENRY HANG
Made Curtains

HANKSCRAFT COMPANY
Model Egg Cooker

HARNISCHFEGER CORP.
Model Cranes in Diorama

HARZA ENGINEERING CO.
Design of Hydro Plants in Diorama

H. J. HEINZ COMPANY
Grocery Display Models

HEVI DUTY ELECTRIC COMPANY
Heat Treating Furnace

HILLE BROS. COMPANY
Grocery Display Models

HOLOPHANE COMPANY INC.
Reflectors

HURLEY MACHINE CO.
Washing Machine

HOWARD & SCHAFFER, INC.
White Upholstery Material

THE HOWELL COMPANY
Beauty Parlor Equipment

HYDROX COMPANY
Grocery Display Models

ILG ELECTRIC VENTILATING CO.
Ventilating Fans (Greenhouse)

ILLINOIS BELL TELEPHONE CO.
Telephone Equipment

IND. GROCERS ALLIANCE OF AMER.
Asst. in Planning Model Grocery

INGERSOLL-RAND, INC.
Boiler Feed Pump for Diorama

INLAND GLASS CO.
Operating Room Lenses

INTERNATIONAL BUSINESS MACHINES CORP.
Sorting Machine

JAMES MFG. COMPANY
Model Farm Buildings

JOHN F. JELKE COMPANY
Grocery Display Models

JOHNS-MANVILLE COMPANY
Asbestos-Ebony Panel

THE KAWNEER COMPANY
Insectolier

KELLOGG COMPANY
Grocery Display Models

KELVINATOR CORP.
Refrigerator

KENDRICK FURNITURE CO.
Office Furniture

KITCHEN AID MFG. CO.
Kitchen Appliances

KLIEGL BROS. UNIV. STAGE LIGHTING CO.
Picture Spot Light

LANDERS, FRARY & CLARK
Electric Appliances

GERTRUDE K. LATHROP
Cast of White Heron

ROBERT LAURENT
Bronze Fish

LEEDS & NORTHRUP CO.
Heat Treating Furnace and Temperature Control Instruments

LEVER BROS. COMPANY
Grocery Display Models

A. J. LEWIS
Loan of 1 K. W. Reactor

LIBERTY ELECTRIC COMPANY
Electric Glue Pot

LINDEMANN & HOVERSON CO.
Electric Range

LINK BELT COMPANY
Intake Screen for Diorama

LIPP, FRANZ
Landscape Architect

LIVINGSTON BAKING COMPANY
Grocery Display Models

LUMINOUS TUBE CORP.
Luminous Tube Color Matching Unit

DR. PAUL B. MAGNUSSON, Prof. of Surgery, Northwestern University
Advice on Surgical Technique

MAJOR EQUIPMENT CO.
Reflectors and Spot Lights

MAPLEINE CO.
Mapleine Extract

MEADOWS MFG. CO.
Home Laundry Equipment

MOLONEY ELECTRIC CO.
Model Transformers

McKESSON APPLIANCE CO.
Model Anaesthetic Table

W. F. McLAUGHLIN & CO.
Grocery Display Models

MEADOWMOOR DAIRY COMPANY
Grocery Display Models

THE METALCRAFT CORP.
Grocery Display Models

METAL SPECIALTIES CO.
Paint Spray Equipment

MICHAEL REESE HOSPITAL
Assistance in Operating Room Models

MILK COUNCIL
Models in Grocery Display

EDGAR MILLER
Artist

MILWAUKEE ELEC. RY. & LIGHT CO.
Model of Appleton Hydro Plant

MORTON SALT COMPANY
Grocery Display Models

MOTOR SERVICE COMPANY
Motor Driven Blower and Compressor Motors

V. MUELLER & COMPANY
Design of Surgical Instruments

MURRAY IRON WORKS
Corliss Engine Design

MUSEUM OF SCIENCE AND INDUSTRY
Tools

MUTUAL SUNSET LAMP CO.
Lamps for Living Room

R. NAKIAN
Aluminum Seal

NATIONAL CASH REGISTER CO.
Model Cash Registers

NATIONAL LAMP WORKS
Technical Assistance

HEWITT & COMPANY, INC.
Electric Sign

NEW YORK EDISON COMPANY
Model of Pearl Street Station

ALBERT NUSSBAUM
Models of Bakery Goods

JOHN OSTER MFG. CO.
Beauty Shop Models

OVERBAGH & AYERS
Reflector for Fish Bowl

OVSON EGG COMPANY
Canned Eggs

PACIFIC COAST BORAX COMPANY
Grocery Display Models

PASS AND SEYMOUR INC.
Porcelain Sockets

PENN. ELECTRIC SWITCH COMPANY
Thermostat

PENNSYLVANIA SALT MFG. CO.
Grocery Display Models

PERMUTIT COMPANY
Water Softeners

PET MILK SALES CORPORATION
Grocery Display Models

PHILCO RADIO & TELEVISION CORP
Radio Receiver, Radio and Phonograph

PITTSBURGH ELECTROMELT FURNACE CORP.
Steel Melting Furnace

PITTSBURGH PLATE GLASS CO.
Glass Table Top

C. W. PLACE
Consultant on Farm.

JOSEPH POLLET
Water Color

PITNEY BOWES POSTAGE METER COMPANY
Mailing Machine

PRATER PULVERIZER CO.
Feed Grinder

HENRY PRATT & COMPANY
Ducts and Smoke Flue
Coal Valve for Diorama

PROCTOR SCHWARTZ MFG. CO.
Electric Appliances

RALPH RAYMOND
Illuminating Engineering

REFLECTOR & ILLUMINATING CO.
Show Window Reflectors

RESEARCH CORPORATION
Dust Collector for Diorama

REX MINERAL SOAP COMPANY
Grocery Display Models

RICHARDSON SCALE COMPANY
Model Coal Weighing Scale for Diorama

H. H. ROBERTSON COMPANY
Model Coal Bunker

ROCKBESTOS PRODUCTS CO.
Soil Heating Cable

RENA ROSENTHAL
Chromium Accessories (Living Room)

ROSENWALD INDUSTRIAL MUSEUM
Consultation and Loan of Equipment

M. W. ROSS
Illuminating Engineering

ROYAL METAL MFG. COMPANY
Model School Desks and Chairs

THE RUMFORD COMPANY
Grocery Display Models

SARGENT & LUNDY
Design of Model Steam Plant for Diorama

SCANLAN MORRIS & CO.
Drawings on Hospital Equipment

SCHMIDT GARDEN & ERIKSEN
Architects—Operating Room Design

SCHMIEG, HUNGATE & KOTZIAN, INC
Furniture

SHELTON LOOMS, INC.
Beige Lapin Upholstery Materials

SILEX COMPANY
Coffee Maker

THOMAS E. SMITH
Model Furniture

S. MORGAN SMITH CO.
Kaplan Turbine Model

T. A. SINDER COMPANY
Grocery Display Models

SOLAR LIGHT COMPANY
Kitchen Lighting Fixtures

SPEEDWAY MFG. COMPANY
Electric Drill

SQUARE D COMPANY
Safety Switches

STAR ELECTRIC MOTOR CO.
Motors

STEBBINS HARDWARE CO.
Hand Tools, Work Bench, Rack

STEINWAY & SONS
Piano (Living Room)

STEWART & ASHBY COFFEE CO.
Grocery Display Models

JOHN STORS
Large Torso

A. STROBL
Fluorescent Paint

EDWIN TILLSON
Illuminating Engineering

MISS NORINE TURNER
Glassware for Model Making

J. H. THROP & CO., INC.
Linen Velour Upholstery Material

TOLEDO SCALE COMPANY
Model Scales

TWENTY NORTH WACKER DRIVE BLDG. CORP.
Reactance Dimmer

UMBRELLA CLOTHES BAR COMPANY
Clothes Bar

UNI-FLO GRILLS CORP.
Ventilating Grills

UNIVERSITY OF CHICAGO PRESS
School Room Film

U. S. RUBBER PRODUCTS, INC.
Model Bathing and Beach Garments

VANCO COMPANY
Grocery Display Models

VIBRATONE CORPORATION
Model Massage Machine

VITROLITE CO.
Vitrolite

VON LONGERKE & ANTOINE
Models of Sporting Goods

VOIGHT COMPANY
Voight Fixture

WARREN TELECHRON CO.
Synchronous Clocks

WATERS-GENTER STRITE AUTOMATIC TOASTER CO.
Model Restaurant Appliances

WESSON OIL & SNOWDRIFT SALES CO.
Grocery Display Models

WESTINGHOUSE ELEC. & MFG. CO.
Sockets and Reactors, Transformer Models, Heating and Ventilating Fan, Welding Equip., Meters, Refrigerator, Model Griddle

WESTINGHOUSE LAMP COMPANY
G-5 and Photographic Lamps and Sodium Vapor Lamps

WESTON INSTRUMENT COMPANY
Color Detector, Light Meters

WHITING CORPORATION
Model Cranes for Diorama

EDWIN L. WIEGAND COMPANY
Industrial Heating Units

WILSON WESTERN SPORTING GOODS CO.
Golf Balls

WIREMOLD CO.
Wiremold and Fittings

WORCESTER SALT COMPANY
Grocery Display Models

YALE SCHOOL OF ENGINEERING
Small Steam Engine

ZION INDUSTRIES
Grocery Display Models

WILLIAM ZORACH
Carved Head, Bronze Figure

LITHO IN U. S. A. TWENTIETH CENTURY PRESS, CHICAGO