

WESTINGHOUSE
ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURGH, PA.



FORM 16406 A

Electrical Visions of 1934
Exhibited by Westinghouse
At A Century of Progress

RELEASE

16A

Revealing the panorama of electrical progress, its past, present and the outlines of its future, the exhibit of the Westinghouse Electric & Manufacturing Company in the southern hall of the Hall of Electricity at Chicago's Century of Progress, presents a more complete view of events that comprised the march of electrical progress than is now available to the public at any place in the world.

The exhibit has been so designed and arranged as to make understandable to the average man many of the fascinating intricacies of modern electrical facilities and it will, as well, reveal to the technically minded, engineering achievements of international significance.

Exhibits demonstrating the generation and distribution of electricity, its control, its application to the home, and to transportation and industry, in its various phases, are joined with research laboratory developments to provide a comprehensive appreciation of the contributions made by Westinghouse to electrical progress. New materials, for beauty and durability; new equipment, some delicate, some massive; these represent the modern outlook; then again, there is a recalling

of those milestones in electrical history, a reference to the pioneers who made those uniquely daring strides of yesterday. Almost without exception, each unit of the Westinghouse exhibit will be alive with colorful action. This is true of the moving stage, on which will be depicted the new day in homemaking, as it is of the illumination exhibit.

The main floor of the semi-circular exhibit will be filled with equipment representing that which is available today, while on the balcony above, will be viewed the research facilities that point toward tomorrow.

THE MERCHANDISING EXHIBIT

The Little Theater of the Home, with its revolving stage, scheduled to present 30 shows daily, is one of the newest features of the Westinghouse Exhibit.

Its entire dramatic action takes place in 11 minutes and depicts the "electrifying" of a home, brightening it with better lighting, and adding to its attractiveness with modern kitchens and laundries. The cast, consisting of one actress, portrays all the human action guided by voice and music provided by sound equipment.

Six complete scenes are shown. The first scene is of the badly lighted living room, depicting the inconvenience and actual discomfort as well as health hazards of inadequate illumination; second, the old-fashioned kitchen, which has added years in nerve-strain to the housewife, as well as actual physical hardship; third, the old-fashioned laundry, with its drudgeries; the fourth a modern laundry with electrical conveniences, where correct layout eliminates physical

strain; fifth, the modern kitchen, the "straight line production" room, where every electrical convenience assists in the preparation of food and where scores of electrical servants are ready to do the hard tasks; sixth and final scene, the correctly lighted living room, showing how ease of living and enjoyment of one's household are predicated upon the ability of electrical engineers to provide proper illumination for this important room.

It is possible to present this entire range of drama only because the stage revolves, bringing each scene to view, quickly and noiselessly, as it has been accomplished only a few times previously, and then only with the most intricate of machinery in modern "de luxe" theaters.

The actress steps from one scene to the other, always in sight of the audience as the scenes come into view providing a most interesting and novel spectacle.

Westinghouse has equipped this theater, seating 150 people, with air-conditioning, thereby making it extremely attractive to A Century of Progress patrons. Here is a spot in the grounds where instruction and entertainment await visitors, with the added features of rest and comfort.

MODEL KITCHEN AND LAUNDRY

Advanced design and arrangement of household electrical equipment will be demonstrated in a model kitchen and laundry where progress in domestic engineering is exemplified. A complete laundry will be exhibited, with all the modern electrical units now available so placed as to eliminate unnecessary steps and handling of material.

The kitchen includes in its equipment every standard electrical unit available today. It, too, has been designed in the "straight-line production" manner, just as assembly aisles of large manufacturing plants are arranged, so that all utensils and materials may be quickly and easily used. Duplication of steps and efforts are eliminated in the newer designs of kitchens, and as Westinghouse has been a leader in this form of engineering, visitors will obtain better ideas concerning the proper placing of equipment, after a visit to this section of the exhibit. Electric refrigerator, range, dishwasher, percolator, mixers and other units will not only be displayed but will be placed properly in relation to each other.

Proper lighting, that necessary laundry and kitchen facility, will also be an interesting feature of the Westinghouse exhibit.

LAMP DISPLAY

Approximately 4000 variations of Mazda lamps are made by the Westinghouse Lamp Company to serve the public. Of this large total there are about 400 standard types, each of which is completely different from the others. A part of the Westinghouse exhibit will include a bank of these 400 different lamps providing, for the first time, an opportunity for the public to

see how many kinds of lamps it is possible to obtain for lighting service. In this display will be a replica of a 100 kilowatt lamp, so large that a medium sized girl could stand inside it and whose filaments are the same size as a lead pencil. Contrasted to this monster lamp will be a grain-of-wheat lamp, tiniest in the world and useful for surgical work.

AIR CONDITIONING

Because air-conditioning is the latest addition to those items which increase our comfort of living, Westinghouse types of will exhibit all/its units which fill the requirements of the smallest apartment to the largest commercial establishment. Those units will be in operation to show how they ventilate, clean, cool and dehumidify in summer and ventilate, clean, heat and humidify the air in winter.

The operating conditions will be most severe for this equipment because it will operate in the open spaces with an outdoor temperature varying at times between 90 and 100 degrees. That temperature will be dropped to 65 degrees at the point where it leaves the conditioner, the air being cleaned and excessive moisture removed as it passes through the conditioner. It is estimated that the equipment being installed in the Westinghouse theatre telling the drama of the electric household will provide 180,000 cubic feet of conditioned air every hour from which there will be removed approximately four gallons of water.

The exhibit office and reception room, also the model of the largest transformer, the inside of which was developed for a "black light" room, will be air-conditioned. These rooms will demonstrate how much more liveable such enclosures can be made with air conditioning equipment..

The units displayed will show quite a few of the variations available, the home and commercial types with various finishes, including walnut, mahogany, and the modern type. They will also demonstrate the ease of installation and the units required for different operating conditions.

Six room coolers will be in operation. Self-contained and requiring no permanent connection, being portable and mounted on casters with various finishes, visitors may move them about, start and stop them, as they would in their own homes.

There will be in operation sufficient equipment to supply 837,000 cubic feet of conditioned air an hour, under normal operating conditions. In addition to that there will be sufficient equipment on display to double this capacity. Some of the equipment will consist of cutaway sections showing the operating mechanism, filters, sprays, etc., all of which are combined in the well designed air conditioned unit.

OPERATING MODEL OF THE WATER WHEEL GENERATOR

Under the glass in the floor rotates a section of one of the largest water wheel generators ever built. With such machines a great percentage of electrical power used in the country is generated from water falls and dams.

In order to describe more fully how this is accomplished the Westinghouse Company has installed an actual operating model of such a generator, to a smaller scale, but complete in all details. This model, 4 feet in diameter, connected with a water wheel turbine will develop electrical power from water in the same manner as the large installation would do. The power generated will be used to supply current for the under water electric light bulbs, which will illuminate the display.

The turbine casing to which the generator is connected and its drain pipe will have large glass windows. The turbine water wheel gates will be of glass as will be the pipe supplying water to the case. With the under water lamps mounted in the case, drain and supply pipe, it will be possible to watch the action of the water at these vital points, giving one a visual indication of how power is generated in the very large installations such as at Niagara Falls and Boulder dam.

HOW IT WORKS:

Water will be supplied to the turbine at the rate of 1600 gallons a minute, with the same pressure it would get from a dam 15 feet high. This water forces the turbine rotor around 400 revolutions a minute in the same manner that wind rotates a windmill.

TAMING LIGHTNING

A section will be devoted to those exhibits of the central station industry which may reasonably be expected to interest the public. Most conspicuous is a 230,000 volt

lightning arrester for the highest operating voltage in the world which stands some 35 feet in the air, like a column built by men from Mars. Below it is a transparency of glass which is normally black as night and is intermittently lighted by : vivid lightning flashes within. It illustrates the need which the giant arrester is intended to meet. On the other side of the arrester is a table with a tiny antique, the ancestor of the modern giant, one of Wurts' first arresters of 40 years ago.

SLEPIAN'S ELECTRIC SWITCH CIRCUIT BREAKER

One of the greatest problems of manufacturers has ^{only} been not/ to generate electricity but to control it in the tremendous quantities in which it is now handled. In this connection there is a case of shatter proof glass within which are two circuit breakers. One of the ordinary carbon type which has been habitually used for the past 40 years. The other of the new De-ion type which is one of the most startling results of Dr. Slepian's research during the last few years. By pushing a button the visitor can throw a short circuit of more than 100 hp. on the breakers in succession. The carbon breaker acts with a burst of flame as large as a dish pan and a report which even inside its casing is sufficient to make the holder jump but the same load thrown on the smaller De-ion breaker is interrupted without a perceptible

spark or scarcely a whisper of sound. To supply this exhibit a 300 kw. motor generator set will be kept running.

MAKING ELECTRICITY

Nearly all electricity nowadays is made from water power or steam power and the central space of display is taken up by full scale models of the machinery which is used for this purpose. Hanging in the air 35 feet from the ground and slowly revolving is the spindle of a steam turbine of 100,000 horsepower, the spindle, however, made of wood but fitted with all the thousands of curiously shaped blades which drive the original machine. Such steam turbines as this are the main reliance of the industry for generating electricity and are the most powerful machines ever built by man.

SYNTHETIC STEAM TURBINE

The principle of the water wheel is fairly well understood, but the steam turbine is perhaps less familiar to the average person. Nearby is a pedestal on which is mounted, with its cover removed, an actual steam turbine of the smallest and simplest type used in industry. It is therefore possible to see the action of such a unit and get a complete explanation of the action of a steam turbine. A collection of polished stainless steel blades which were used in the original of the dummy turbine overhead are mounted on the sides and front of the pedestal, providing an idea of the high degree of accuracy required for the thousands of blades in one such rotor.

ELECTRICITY IN INDUSTRY

On the other side of the water wheel generator is a large space devoted to showing why electricity has attained such wide use in industry. Because its industrial functions are myriad only a few of the most interesting applications are shown.

TRIODE DEMONSTRATOR DISPLAY

Realizing the need of a device which would make simple the understanding of the thermionic tube, Westinghouse developed the triode demonstrator. Being a device which simplifies the explanation of the action of these tubes, it will be appreciated by the student. As tubes are becoming more and more popular for control and power applications, design and operating engineers must study and understand their characteristics. Therefore, the display will be of benefit to them.

The display consists chiefly of a tube approximately fifty times larger than an ordinary radio tube having all the necessary elements increased proportionately. One can readily see them. The elements are assembled in the tube just the reverse from their assembly in a standard tube making very plain the parts which are ordinarily difficult to see. Those parts, namely the plate, grid and filaments are treated with chemicals which glow when current passes through them, the intensity of the glow being in proportion to the amount of current passing. Consequently, it is possible for one to see those parts performing their various functions.

IGNITRON TUBE WELDING DISPLAY

This unit will be mounted in a case composed largely of shatter proof glass, permitting the operator to watch the machine in operation. It will show the very latest in the art of welding sheet metal by the use of thermionic tubes. The process is such that two sheets of polished metal can be welded with an exceedingly small amount of power, and sheets only a few thousandths of an inch thick will show very little perceptible discoloration at the weld. The required power is small, because the function of the ignitron tube is to permit current to flow only long enough to produce a spot weld. There is little discoloration, because the weld is made so quickly, that heat from the welded surface does not have time to pass through the welded thickness, before the weld is complete.

The equipment can be made for either spot welding or seam welding; the weld being so firm that in tests and parent metal tears and the weld remains uninjured. The seam weld can be made gas tight, capable of withstanding thousands of pounds of pressure.

HOW IT WORKS:

By the pressing of a button mounted outside the case a complete cycle of operation will be started. The machine will draw polished strips of steel one half inch wide by .010 inches thick from two reels, automatically welding the two strips together as they are drawn from the reel. When three inches

of length have passed, the machine will automatically sheer off the strip and stop. The three inch length of welded strips will fall outside the case ready for inspection by the operator who will keep it as a sample or souvenir. The machine is then ready to repeat its cycle.

STEEL - ROLLING INGOTS

For the manufacture of steel electricity allows greater power than would ever be practicable with steam and in this connection is shown an actual operating scale model of one of the most powerful steel mills in the world, driven by the recently invented twin motor drive. This is 1/24 scale model and can be actually operated under full automatic control rolling out steel ingots into H-sections.

MOTORS

A novel exhibit to show the versatility of modern electrical motors demonstrates their reversing characteristics, ability to run under water and a pump mechanism, all in one. This exhibit will run continuously.

RUBBER - QUICK STOPS

Safety alone is a sufficient reason for the use of electricity in some industries, although it is usually not the reason. In a rubber mill for example were a man's clothing to be caught in the slowly moving rubber going into the rolls it would be a very serious matter if the mill could not be stopped instantly. For this purpose there has been developed

the 300 hp. synchronous motor which is shown on the floor. The visitor can start this by pushing one button and after it has come up to speed can push a second button which will stop it from full speed, in less than one second. No other form of drive could ever stop so suddenly. This 300 hp. motor is the largest revolving machine in the exhibit which the visitor can play with. The fact that there are no railway tracks into the exhibit building and no crane made it impossible to show machines of the largest size.

DIESEL ENGINE - MOST HP. PER LB.

Transportation is the next development shown. Because actual transportation is done by means of very large units the exhibit here is confined entirely to models, except in the case of an actual Diesel electric generating set of 240 hp. which is of the latest design. Such a unit is used to furnish power for self propelled railway cars and for the lighter class of switching locomotives. The Diesel engine of which this is representative has the highest efficiency of any device for turning fuel into power and the design which is shown is remarkable for its high speed and light weight, in marked contrast to most Diesels which are cumbersome and heavy. Both engine and generator are of Westinghouse manufacture. As they turn over slowly visitors can look into the electric lighting crank case through plate glass windows.

MARINE - S.S. PRESIDENT COOLIDGE

Near this diesel generator is a remarkably beautiful model of one of the latest of American liners, the President Coolidge of the Dollar Line. This electric-driven boat, the original of which is fitted throughout with Westinghouse propulsion and cargo handling equipment, unlike most models rides in a clear tank of water which concealed pumps set pouring aft at an approximate scale speed of the original. When the visitor touches the whistle button nearby he is answered with the characteristic type bellow of the liner. The model is equipped with electrically lighted cabins and small pumps, which supply the water discharge seen coming from the side of a docked ship.

RAILWAY - PENNSY LOCO

Nearby is a pedestal representing land transportation. On top is an extremely beautiful model of the latest of electrical locomotives, the largest one used on the Pennsylvania Railroad. This model is made to 1/16" scale. This probably represents the utmost in the model maker's art as applied to locomotives. Its lights light, its wheels revolve and only the limitations of space prevent its being seen in operation on a track. However it rests upon a faithful reproduction of real track and above it is the catenary overhead which would supply current to it. On either side of the pedestal is a frieze of a wooden silhouette of the diesel electric locomotive, the subway car, trolley car and trolley bus

which are the reliance of American people in mass transportation. In marked contrast to the giant of 1933 on top of the pedestal are plastic figures at either end, scale models of an actual locomotive of Civil War days with its diamond stack and outreaching cow catcher and on the other end is the street car pulled by ^a patient mule. Many of these were still in use at the time of the former Chicago Fair.

AIRSHIP - "COMMAND" THE MACON

Transportation by air is not usually thought of as being electric but nevertheless the great airships built by the Goodyear Zeppelin Corporation carry a very impressive electric power plant and an astonishing number of motors and illuminating devices. As a reminder of this a very beautiful scale model of the latest of these airships, the Macon, soars about overhead in a long oval path.

FARM LIGHT PLANT

A farm light plant, sections of which have been cut away so that its action may be seen, demonstrates the simplicity and rugged construction of this important adjunct to the farm.

BLACK LIGHT - SEE YOURSELF

The last display on the main floor is a full scale model of the most powerful transformer ever built. The tank, itself as large as many a two story cottage, is of building material with a towering column of insulators on top, which

reach 35 feet into the air. There is nothing inside the tank except a dark room which is used for the exhibit of the remarkable effects of ultra violet light. When illuminated by ordinary light a series of posters, decorative wall coverings especially developed by the Standard Textile Products Company, are observed but when the ordinary light is replaced by "black light" from ultra violet sources the pictures change completely, the wall covering turns to luminous designs of underwater life and the visitor is amused by the extraordinary effects he can gain by seeing his own face in a mirror and by the effects of luminous decoration on electric fans and other furnishings. In this dark room also will be shown a number of forms of torchiers, floor lamps and other equipment which are actually available for use in the home.

MICARTA PANELS OF PROGRESS

Beneath the gallery, around the 200 foot wall of the building, are a series of panels depicting the great events of the formative period of electricity which in a few decades determined the present stature of the art. On the walls are panels of a new decorative medium, inlaid Micarta, showing in color, ultra modern designs representing the alternating current which first made electricity universally available; of polyphase which made one sort of electricity perform the services which had previously required a dozen, of Niagara where Westinghouse first showed that the cataract power could be tamed; of the steam turbine which set free the generation

of electricity in unprecedented power; of high voltage railroad electrification which first made it practicable to electrify railroads over considerable distances; and of radio broadcasting which, as everyone knows, Westinghouse originated at KDKA.

Beneath these wall panels is an historical shelf composed of alternate tablets of experimentation and historical pictures and models. The visitor can read as he walks along the picturesque and striking drama of electrical development.

METERS AND INSTRUMENTS

No less than ten showcases have been required to display the full line of meters, instruments and relays manufactured in the Westinghouse Newark Works. The Century of Progress will have the first exhibit of the complete line of new developments for the measurement and control of electrical energy.

RESEARCH

POWER BY RADIO

On the mezzanine floor above as the visitor reaches the top of the circular staircase, he will see a demonstration of the effects of short wave for high frequency current. Here a substantial fraction of a horsepower is transmitted without wires over a distance of 20 feet or more, electric lamps, which unattached to anything, will burn when held in the visitors hand, waves of radio power which create a feeling of warmth in one part of the body while not affecting the others, the invisible "death rays" which are useful in killing weevils in grain as

well as microbes, waves whose therapeutic results create an artificial fever that can be regulated at will, and voices and music sent over a beam of light.

RADIO BEAM TRANSMITTER

Radio beams, which can be reflected almost to the same degree as light beams, will also be demonstrated as a part of the research exhibit. In beamcasting, the sender focusses the radio waves upon a silvered parabolic mirror which concentrates the rays into a long narrow beam diverging only a few degrees. In the receiving set a similar mirror gathers the beam waves and, in turn, focusses them upon a tiny aerial less than two inches long.

The rays can be deflected by any flat material placed in their path. Metals reflect the radio beam almost completely while non-metallic substances absorb part of their energy.

This development may have important possibilities as a medium for secret communication, either for military or commercial applications. It demonstrates another fascinating phase of radio.

FILAMENTS LOOK BIG AS ROPE

In the bay next to the short wave display will be an exhibit by the Westinghouse Lamp Company. There is a show case full of the extraordinary tiny parts which make up lamps, wires of rare metals, and filaments varying from the heavy bars used in airport flood lights to the almost invisible threads which are necessary to make the tiny grain of wheat lamp.

Raw materials for lamps come from almost every part of the United States and this ^{fact} is emphasized by a wall map of the United States and a long case showing the raw materials which come from each section. There is a photometer which shows how the light output of lamps is compared and an airplane view of the great Lamp factory at Bloomfield.

SEE BONES IN YOUR HAND

On the other side next the rail is an actual X-ray outfit which the visitor can operate. He can push the button and see the bones in his hand or the money in his closed purse. Beside it is an exhibit of the extraordinary variety of Mazda lamps now available large and small from the 10,000 watt which light airports to the grain of wheat lamp so small that it can be thrust down a patient's throat in a hospital.

TWO-PIECE "STOPPER" LAMP

Beside this case is an historical collection of the old types of incandescent lamps from which the present industry

has sprung which, although only 40 years old, now seem as odd to the practiced eye as prehistoric monsters. Included among these lamps will be the historical Stopper type which was invented by George Westinghouse to meet an emergency in 1893. Having taken the contract for lighting the former Chicago World's Fair, he found himself debarred from the use of existing patents which, at that time, were considered to be essential to a successful incandescent lamp. The "Stopper Lamp" was devised and manufactured in great quantities and successfully lighted the World's Fair, the greatest example of electric lighting which had been accomplished to that time.

"ELECTRIC EYE" - BURGLAR PROTECTION

In the next bay the central exhibit will be a photo electric burglar alarm protecting a cage such as might be used by a bank teller. No matter how fast and carefully the hand is thrust into the cage its shadow causes a barrier to rise suddenly from below and protect the treasure within.

SEEING SOUND

With the oscilloscope and its microphone, the visitor can speak or sing and see his voice analyzed into its integral and curious sound wave patterns. He can see why a hiss or a growl sounds the way it does and he can compare the waves of his own voice with that of his companion.

HEAT TO SOUND

The warmth of a hand held any where near this device makes it emit a low growl and the lighting of a match several feet away is rewarded by a snarl while gentle warmth from distance produces simply a mild purr. This device can be adjusted to such sensitiveness as to respond to the heat of a burning match 40 or 50 feet away, or it will indicate the near proximity of icebergs to ships at sea. But it will not be made so sensitive at the Fair because it would be distracted by the warmth of the bodies of the passing crowd.

VERTICAL PARKING

In the opposite corner is a working model of the parking machine, one of the most promising devices for solving the congestion of American city streets. It is, in effect, a vertical endless belt, each of whose lengths supports an automatic device to park one's car. It is only necessary to put a key in the appropriate hole corresponding to that belonging to the holder and the machine at once responds by bringing this compartment to the ground level. The car owner thereupon drives his machine onto the compartment, steps out again, uses his key and his car disappears out of sight, remaining in the machine until he wishes to take it out. By this purely mechanical parking system 50 cars may be stored in a ground space which would otherwise accommodate only half a dozen and unlike most undercover storage the cars are never handled or driven by any one save the owner and are not subject to

the fire hazard represented by attendants. The model, which is built on a scale of 1/16 actual size, employs model automobiles which are reproductions of designs based on combinations of the three most popular American cars. Naturally they are not self propelled but are pushed in and out of the machine by the visitor. The model parking machine responds to its control in a manner similar to that of the actual machine.

TELLS WEIGHT - MAGNETIC STRAIN GAUGE

In this same bay is found a magnetic strain gauge which is perhaps the most sensitive device for measuring extremely small deflections. It is able to indicate even a millionth of an inch. For example, there will be an actual railroad rail on which the visitor may step and observe on a nearby dial the amount which his weight has caused the railroad rail to bend.

"ELECTRIC EYE" - VARIOUS APPLICATIONS "OPEN SESAME"

This central exhibit of the bay is flanged on one side by a photo electrically controlled cabinet of the metals of the future. Its closed doors can only be opened by the use of a beam of light from a hand flash light nearby. When the visitor directs this beam on the spot marked open, the doors swing open and a display inside is of many samples of the new metals which are likely to have such a great effect on development; iron and aluminum in large crystals, distilled metals and the gases which have been driven from them, a rediscovery of the hardened copper of the ancients and new alloys such as Konal which retains its strength when red hot.

Hipernik, which responds to magnetism more readily than any other metal ever discovered has made the measurement of electricity very much more accurate. In the case too, are the puzzling little arrangements of black and red wooden beads strung on wire which represents to the scientist the atomic arrangement of different metals. When the visitor has finished examining these curiosities he spots the beam of the flash onto another target labelled "close" and the doors of the cabinet move together as mysteriously as they opened.

SAVES 8 MILLION DOLLARS

Iron, with improved magnetic properties, is not merely a scientific curiosity, as practically all of the electricity in the United States is handled through transformers, and the amount of electricity they waste is determined largely by the character of iron of which they are built. Were the iron of 40 years ago used in modern transformers the public would be paying about eight million dollars a year for the waste of electricity.

Constant research during this two score period, however, has so bettered the magnetic iron used in transformers that the public has been saved this enormous bill.

A most interesting example of such improvements is shown by a coil into which the visitor may thrust two samples, first, one of the iron used 40 years ago which causes the pointer of a meter to indicate on its scales the energy wasted in the magnetizing of iron; the second, a similar sample of modern iron for which the meter indicates very small losses.

Another demonstration of improvement is shown by two transformers at the back of the table, one of 40 years ago, the other of today, both of the same rating but strikingly different in size.

FLOATING STEEL

Cobalt steel is another very curious material which alone, of all the metals in the world can be made to nullify the force of gravity and support its own weight in the air. In the opposite side of this bay is seen a large cobalt magnet floating unsupported which the visitor can push down and it bobs up exactly as if it was on a spring. If it were only possible to build airships on this principle! Unfortunately Cobalt's power to lift itself is limited to about one inch.

SENSITIVE BI-METAL

Another very curious sort of metal is known as bi-metal; it is really a pair of Siamese twins of two metals welded together. When heated it curls. It is very widely used for the control of electrically heated apparatus, and to illustrate this there is an electric iron cut open to show the bi-metal control device which keeps its temperature constant.

FLIP-FLOP HEAT ENGINE

More interesting to the public, is a demonstration consisting of 18 bi-metal discs which fall alternately on hot and cold plates and consequently incessantly jump back and forth on curved monorail tracks. Nearby is another exhibit of bi-metal peculiarities, -- a pointer which registers an invisible ray of heat. The visitor can intercept this ray by raising a barrier whose shadow protects the points. Immediately the pointer returns to zero. When the

barrier is dropped, the long bi-metal pointer of the meter feels the heat and moves the indicator.

ULTRA STREAMLINING

It has been known for many years that railroads could run much faster than they do, even up to 150 miles per hour, but until recently it was supposed that the amount of power required would be prohibitive. Studies of streamlining have shown that with trains shaped like airplanes, such high speeds are quite practical as far as power is concerned, and on a table are little wooden models of a street car as ordinarily built and of the same street car as it would be streamlined for a 100 miles an hour. Beside it is an electric locomotive and pullman as they are now built, and as they should be built for minimum air resistance and high speed.

These little toys are the models actually used in streamlining tests in the Westinghouse research wind tunnel.

MOVING THINGS STAND STILL - WATER RUNS UP HILL

Next is shown the stroboglow outfit, that magic pulsating red light which shows moving objects as if they were stationary, regardless of speed. Water dripping from faucets, appears as a steady stream, but, instead is seen as a series of little rounded pearl droplets which can be made apparently to descend slowly from the faucet, hang stationery in the air, and even rise from below and go back again into the faucet -- like a motion picture run backwards. A vibrating violin wire is shown with its actual "nodes and loops" frozen in mid-air.

A small flywheel with broken spokes, a pair of gears with broken teeth, a piston in a cylinder and the reciprocating motion of a rocker arm will apparently stand still so that their flow may be inspected while motion continues.

FREE ELECTRICITY FROM DAYLIGHT

Then there is the photo-voltaic cell, which manufacturers electricity direct from daylight. It is a little disc no bigger than a wrist watch which when held toward the light registers on a meter the electricity it is making .

Turning away from the light the meter goes to zero. If it were only possible to make this device in large sizes, American cities might get all their power from acres of metal sheets exposed to the sun light, exactly as the Rock of Gibraltar gets its water supply from acres of metal sheets exposed to the rain. Unfortunately, for the present, the photo-voltaic cell cannot be made to generate large amounts of power.

BLOW OUT THE LIGHTS

Nearby is the breath relay. The visitor by merely breathing upon a sensitive plate can turn the lights in the compartment on and off. The same device could, if necessary, be made to start a steel mill, a locomotive or a battle ship by an impulse merely of the breath. In the next panel bay of the mezzanine are a group of the tremendous lights used for airports, the 1000 watt landing field floodlight which makes landing safe at night, mounted on a pole of spun concrete. The visitor can turn this on and off, and beside

it on the table is the airway code beacon, an odd looking column of glass, three feet high which incessantly floods in green light the code word "W". Lenses produce the colors, which are then blended. Travelers on a country road seeing this beacon at a distance, do not realize what enormous lights they really are. Beside it, is the code flasher which must be relied upon to actuate the flash of airways code beacons at remote spots for months at a time. A wall picture of an actual airport shows the innumerable ways in which electric light is essential to night aviation. Around the railing of the gallery are a series of the little colored obstacle lights which are used to mark the boundaries of an airport and lighting.

SHOOTING DOWN PLANES

On a table where the visitor can play with it, is a light weight portable searchlight with pistol grips, by means of which airplane traffic can be controlled from the ground at airports. By the two trigger-like switches code signals, both in various colors and in dot and dash, can be transmitted even in daylight to very long range. And finally, above all is the enormous 36 inch airport revolving beacon, its double beam of light sweeping around the wall exactly as do the long chain of its comrades which mark the airways of the United States.

MOBILE COLOR

Pillars of mobile light, a continuous changing of blended colors, form the back wall of the Westinghouse

exhibit. The cycle of color changes is performed automatically by sensitive equipment. Eight hundred forty floodlights, with red, blue and amber lenses produce the colors, which are then blended and transformed by the mobile light unit.

219400 -- At the 1934 Century of Progress Exposition, Westinghouse will display the latest and greatest in a portion of the semi-illustrated exhibit of electricity (foreground), by the way.

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219341 -- Westinghouse will have a display of the latest in power in the form of a semi-illustrated exhibit of electricity.

219319 -- This Westinghouse illuminated fountain in the Electric World will be open the Westinghouse Century of Progress exhibit.

219311 -- Westinghouse exhibits for the 1934 Century of Progress, Chicago, range from a model of the Pennsylvania locomotive to power by radio.

219207 -- Moving silhouettes in the Westinghouse's Tower of Progress depicts the history of power, electric traction, lighting, etc.

217375 -- Tremendous crowds flocked to the World's Fair in Chicago 80 years ago which definitely influenced social, economic and industrial trends. The forthcoming Century of Progress will probably leave a similar mark on the American people. (Westinghouse photo.)

26 -- Three of the 12,000 hp. two phase Westinghouse alternators that supplied power to the Chicago World's Fair of 1893. This exposition was by far the greatest use of electricity up to that time.

WESTINGHOUSE AT A CENTURY OF PROGRESS

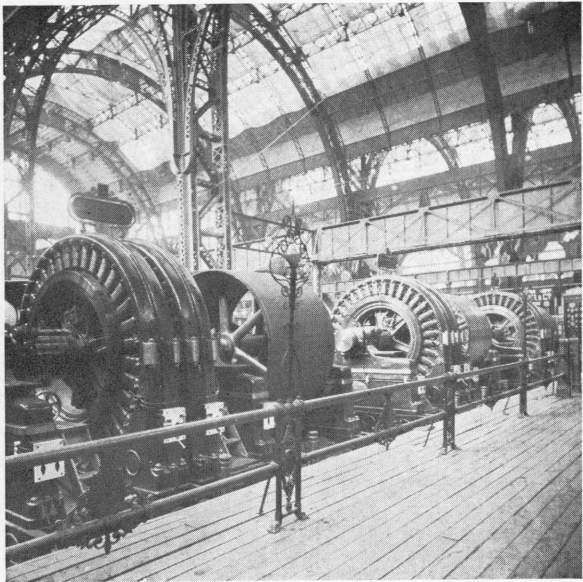
Illustrations

- 219400 -- At the 1934 Century of Progress, Westinghouse will display the latest scientific wonders in a portion of the semi-circular Great Hall of Electricity (foreground), on the stand.
- 219341 -- Westinghouse mushroom lighting units such as these in front of the Planetarium furnish pleasing illumination.
- 218819 -- This beautifully illuminated fountain in the Electrical Court is near the Westinghouse Century of Progress exhibit.
- 221231 -- Westinghouse exhibits for the 1934 Century of Progress, Chicago, range from a model of the Pennsylvania locomotive to power by radio.
- 218857 -- Moving silhouettes in the Westinghouse's Tower of Progress depicts the history of power, electric traction, lighting, etc.
- 217375 -- Tremendous crowds flocked to the World's Fair in Chicago 40 years ago which definitely influenced social, economic and industrial trends. The forthcoming Century of Progress will probably leave a similar mark on the American people. (Westinghouse photo).
- 26 -- Three of the 12-1000 hp. two phase Westinghouse alternators that supplied power to the Chicago World's Fair of 1893. This exposition was by far the greatest use of electricity up to that time.

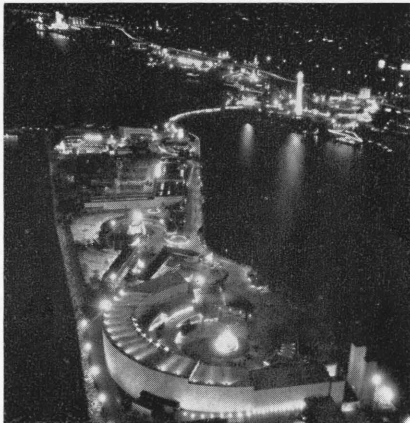
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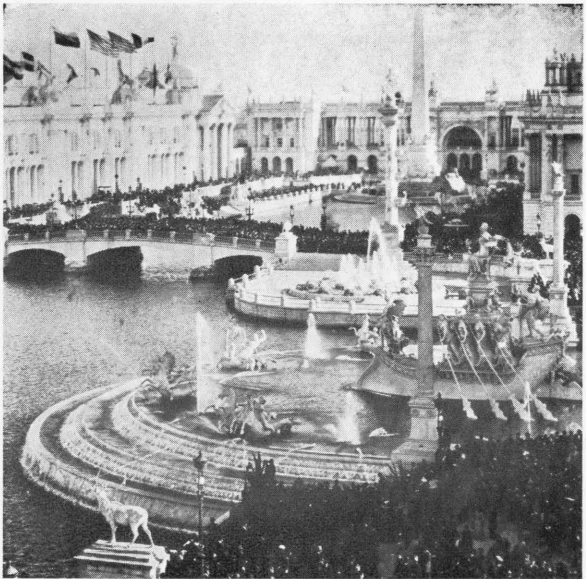
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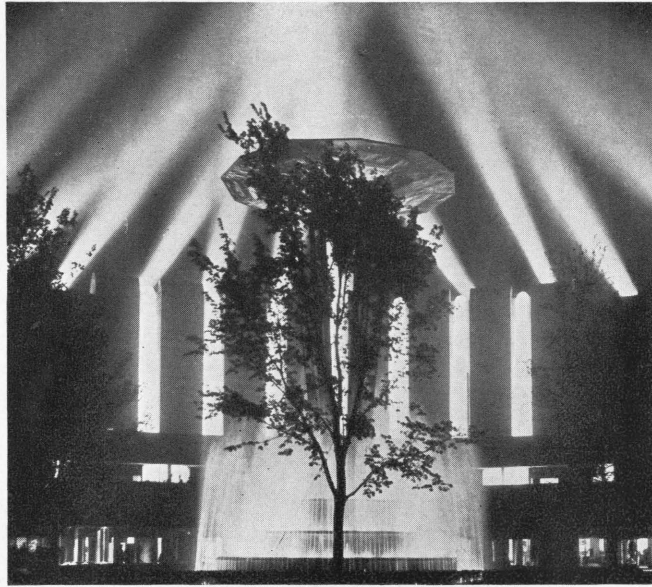
219400



217375



218819



221231



219341

