WESTINGHOUSE GIVES VISITORS A LOOK AHEAD AT CENTURY OF PROGRESS

The Westinghouse display in the southern half of the Great Hall of Electricity at Chicago's Century of Progress, shows how the world has been transformed since 1886 when George Westinghouse first introduced the now universal "alternating current". The exhibit will interest the average man as well as technical experts - the latest tricks of electricity in the home, ultra modern uses of electricity in industry, latest means for generation and distribution of power, advances in transportation, and the miraculous things that scientists are doing in Research. Wherever practical, the displays have been made to work and arranged so the visitor can operate the exhibit; for example, anyone speaking the necessary words into a microphone may start or stop an impressive model of the dirigible Macon, or by merely pushing a button you may see the bones in your hand.

A balcony 12 feet high serves as a canopy for the main display on the ground floor. On the facade of the balcony appears a unique sign of the single word, "Westinghouse" done in sheet metal letters. Colored lights located below illuminate the sign in such a way as to make the letters appear to change constantly.

Along the top of the balcony a promenade, 15 feet wide and running for the full 156 feet of the exhibit, displays the latest marvels of research. Extending above the balcony to the uppermost part of the exhibit structure is a massive facade on which will play pulsating colored lights.

Perhaps the most spectacular feature of this towering facade is produced by columns of semi-circular discs, each a wheel of light. Amber, green, red, blue and white lights are so arranged that lighting combinations is infinite. They are 10 feet in diameter, 8 inches thick, and are separated 4 feet apart, numering eleven in each column. Eight of these columns of light, 23 feet apart, will stretch along the full length of the promenade.

Starting in at the left of the long curved hall housing the Westinghouse exhibits, visitors encounter the following displays as they walk along towards the steps leading to the mezzanine.

TOWER OF PROGRESS

The tower of history, at the extreme left of the hall, shows the progress of lighting, transportation, and industrial power. It consists of a series of three translucent cylinders one above another in the left end of the Westinghouse exhibit. The diameter of the smallest and lowest is 14 feet, the second is 16-1/2 feet and the largest which is at the top is 19 feet. They are illuminated from within by lamps of 3000, 5000, and 10,000 watts capacity respectively. An automatic switching device causes the three cylinders to work in rotation. First across the face of the lowest cylinder there moves from right to left a series of silhouettes effecting the development of light, the candle, coal oil lamp, fish tail gas jet, carbon lamp, open arc lamp, Nernst lamp, enclosed arc lamp, mercury vapor lamp, flaming arc lamp, tantalum lamp and Mazda lamp.

The second cylinder depicts the development of transportation. Its silhouettes include the old fashioned locomotive, the horse car, the first trolley cars, earliest electric locomotive, elevated steam locomotive, main line electric locomotive, subway cars, diesel electric locomotive, interurban cars and trolley buses.

The third cylinder covers the development of industrial power. Its silhouettes include an old fashioned water wheel, a steam engine of 1830, a high speed automatic engine of 40 years ago, the great Corliss of 1876, one of the first electric motors, one of the last great Corliss engines, a great gas engine, the steam turbine, a steel mill motor and a portable electric tool.

SEEING REFRIGERATORS MAKE "COLD"

In a room on the main floor will be exhibited some seven types of the most modern electric refrigerators. The room in general simulates the store room of a dealer in Westinghouse refrigerators. A feature will be mobile color lighting scheme by which the back wall will be flooded with gradually changing colors from concealed projectors. Here the visitor will be able to examine electric refrigerators, have their fine points explained and also to see a sectionalized refrigerator showing the actual mechanism at work under glass.

"DEAD END" KITCHEN: ELECTRIC LAUNDRY

Next door are the modern kitchen and the modern home laundry. Both represent the latest development in electricity's ability to perform household work. The kitchen will be laid

out by one of the foremost authors in the United States on kitchen design, to economize steps for the housewife. It is a "dead end" kitchen, that is traffic from the back door into the house will not pass into the kitchen and consequently interference with kitchen work will be minimized and there will be no messing up of the kitchen floor by back door visitors.

In the kitchen will be the newest of electric ranges, electric refrigerators, electric dishwashers and every other species of electric kitchen appliance including an exhaust fan to protect the house against boiled cabbage and fried onions. A part of the construction of the sink will be of Micarta. Not only the electrical equipment but kitchen cabinets, work benches and other fittings will represent the latest in domestic art.

The laundry like the kitchen will be fully equipped with the latest appliances including electric washing machine, water heater, ironing machine, automatic iron and ironing board for intricate pieces, etc. There will be stationary tubs and other laundry equipment and a charming young woman will be seen at work alternately in the laundry and in the kitchen. Both kitchen and laundry will also represent the latest and best arrangement for such work rooms and both will be equipped with "Load Centers" by which the housewife is free from the annoyance of unexpectedly blown fuses.

HOUSEHOLD APPLIANCES

Nearby, an additional display of electric appliances for the home will be found in the 8 foot diameter glass cylinder which supports the Tower of History. Around this cylinder arises a circular staircase to the mezzanine floor. Above and inside the cylinder brilliantly illuminated will be a helical show case filled with irons, vacuum sweepers, waffle makers, percolators and every other sort of device for the home including gaily colored unbreakable cups and saucers and Micarta trays.

TAMING LIGHTNING

On the main floor next to the model home is a section 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. Next to it on one side is a transparency of class which is normally black as night and is intermittently lighted by a vivid lightning flash within which shows a transmission line at night silhouetted against black storm clouds and 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.

INSIDE A RECTIFIER

Nearby is another gigantic piece of apparatus, a 1500 kw. mercury rectifier whose function is to change "alternating current" (the form in which electricity is usually made and handled) to "direct current" (the form in which it is required for street railways). This device though old in principle has within the last few years become very important and has been very highly developed. Little porthole in the lower steel tank allows the visitor to peer into the incandescent inferno inside of boiling mercury and incandescent mercury vapor.

FIGURE YOUR LIGHT BILL

More interesting to the average man is the means by which his electric light bill is figured and its accuracy. In this connection there is a board showing the extraordinary accuracy of the newest electric light meters not only throughout their normal range but even up to three times their regular load. A large collection of devices which might be found in the average house are shown here each successively turned on for a few seconds, and as each is connected a light flashes on the large accuracy curve above and indicates any error which is possible for this load. From the tiny clock motor with 3 watts to the two burner hot plate using 1600 the meter does not show an error of even 1%. In marked contrast to the accuracy of the new meter is the drooping curve of the first meter invented by Shallenberger 45 years ago. Despite its error it was a tremendous advance because before that there had been no meters at all.

SLEPIAN'S ELECTRIC SWITCH

A crowd of small boys will probably be found around the Circuit Breaker Display, in this section. One of the greatest problems of manufacturers has 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 armored 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 1000 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 with a scarcely perceptible spark and a whisper of sound. To supply this exhibit a 300 kw. motor generator set will be kept running. Short circuits which are regarded as a calamity with ordinary electrical machinery will be thrown on this motor generator dozens of times a day.

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 hp., 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. Beneath the main floor and protected by glass plates through which the visitor can look is a full scale aross section in the actual materials of the original, copper, iron and insulation, of the most powerful water wheel generator ever built by the Westinghouse Company rating some 70,000 kv-a. and built for the Diablo-Skagit development of the City of Seattle.

Like the steam turbine overhead the water wheel under foot is slowly revolving and is seen silhouetted against a white background brilliantly lighted by concealed lamps.

SYNTHETIC STEAM RUNS TURBINE

The principle of the water wheel is fairly well understood by everyone but the steam turbine is perhaps less familiar so consequently nearby is a pedestal on which is mounted an actual steam turbine of the smallest and simplest type used in industry - a single disc revolving slowly under the apparent impulsion of a jet of artificial steam which is directed against its blades. This is not real steam. It is synthetic vapor producted by the aid of solid carbon dioxide and an alcoholic mixture. A complete explanation of the action of a steam turbine and a collection of the polished steel blades which were used in the original of the dummy turbine overhead and on the sides of the pedestal and in front there are interesting models made to scale of the 5000 hp. Manhattan type steam engine generating unit which formed the high point of

the steam engine development in 1900 and of the tiny turbine which is sufficient to supply the same power today. This contrast shows vividly the reason that turbines have made the steam engine obsolete.

MITE GOVERNS MIGHT

Not the least interesting part of the model steam turbine is the means by which its terrific flood of power is controlled - the governor, the latest and in many ways most effective of these is the hydraulic governor recently developed at South Philadelphia. To show its extraordinary ability to control large forces with very small ones, there is exhibited an amusing device called the scalavator which consists of a platform on which the visitor can stand and lift his own weight by the weight of his breath. Blowing ever so lightly on a thin membrane on top of the pedestal causes the visitor to be raised several inches even though he be a 300 pounder.

ELECTRICITY IN INDUSTRY

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

STEEL - ROLLING WAX INGOTS

For example in steel mills electricity allows mills of 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 will be actually at work under fully automatic control rolling out steel ingots into H-sections. The steel however is really colored wax. All that the visitor needs to do to start the mill is to pick up an ingot of "red hot steel" and drop it on the rolls and thereafter it goes back and forth through 21 passes just as though it were really several tons weight of metal. Beside this mill will be shown several of the Micarta roll neck bearings which have shown their ability to work several months in a service which destroys bronze in a few weeks.

PAPER - SENSITIVE SPEED CONTROL

Precise speed control is the feature of electricity in a drive of this kind shown by a pair of actual paper mill sectional drives, motor and gear unit complete which the visitor can play with. One motor runs unloaded. The visitor can apply heavy loads to its companion with a hand brake but no matter how heavily he loads it down it will not slow down more than its companion and although the two motors have no mechanical connection between them their speed remains so precisely the same that a thread running over the two shafts will not break. This precise speed matching is performed by the newest development of research for the purpose, a thermionic speed matching outfit. In other words this extraordinary speed control is the latest practical development of the off-spring of the radio tube. Above the apparatus is a simplified running model of a paper mill showing those who are not acquainted with paper manufacture how the paper evolves from a tank of watery pulp to its final stage on the reel.

RUBBER - QUICK STOPS

Safety is alone a sufficient reason for the use of electricity in some industries. Although it is usually not the only reason, in a rubber mill for example were a man's arms 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 and 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.

MINING - RIDE THE LOCO

In mining electricity is important for many reasons. It has freed the mule from underground haulage and in the exhibit is the smallest size of actual mining locomotive of the type driven by storage batteries where a trolley wire is not permissible. Visitors can ride on this tiny locomotive and run it to their heart's content although being mounted on rollers it does all its running in one place.

Safe Motors and---Heads

Many mines have explosive gases and nearly all mines are wet and drippy places. For this purpose mine pumps and other apparatus are driven by electric motors and are water

proof and so built that they cannot ignite explosive gases. And so beside the mining locomotive is an actual mining pump of the sort intended for these conditions with an explosion proof and water proof electric motor and control. The visitor can push a button and with the pump actually at work pumping the muddy grity water with which it would have to deal in the mine.

Few people outside a mining district have any idea of what a mine is really like and for this reason there is shown a display board representing the cross section of a coal mine and shows the important uses to which electricity is put.

The individual miner is in constant danger of having a chunk of coal or rock bounce off his head and to assist him in meeting this emergency a short of electrical insulated cored Micarta helmet has turned out to be the most effective protection.

With a helmet made of Micarta a miner can take the fall of a 8" sledge hammer on his head and still smile. Such helmets will be shown nearby and the visitor can try them on but is not compelled to test their effectiveness.

OIL - CONTROL FROM A DISTANCE

Very few people realize the thousands of pipe lines which cover the eastern half of the United States with a spider web of steel pipe. Oil can now be pumped from Western Texas clear to Chicago and New York City. Every few miles along these pipe lines are the lonely pumping station each with its three shifts of engineers. To free these men from their lonely duty and the pipe line industry from this heavy expense is the

function of the Supervisory Oil Pipe Line Control by which from an office building in Tulsa for example can be operated half a dozen unattended pumping stations covering a 100 miles or more of pumping lines. A working model of such a pumping station is shown with its three electrically driven pumps and its elaborate and intelligent control devices and "miles away", actually only a few feet, is the control station in the city office building, from which the visitor can control all the performance of the distant pumping station starting any one of the three motor pumps or any combination, reading the flow of oil through the station and assuring himself that it is functioning correctly.

MOTOR'S FAMILY ALBUM

Electric power in industry of course depends primarily on the electric motor which was developed by Westinghouse about 40 years ago. Nothing is more striking than its rapid improvement since and to illustrate this there is shown a group of historic motors, first one of the small models built by Tesla. Next a 10 hp. "Type B" motor the first form in which the induction motor was generally used. Next smaller and most efficient than the type B comes the type C of which thousands are still running. Much smaller still is the type CCL followed in turn by the type CS of a few years ago and by the type CS of today with all its interchangeable features. It is astonishing to see what a toy the model 10 hp. motor appears beside its progeniture of 40 years ago and it is more efficient, more reliable and costs the purchaser incomparably

less. Beside this collection of motors as a novelty is the "slowest motor in the world", a research development intended eventually for marking time which without gears of any kind revolves but once a minute.

DIESEL ENGINE - MOST HP. PER LB.

Transportation is the next development shown and 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. and of the latest design which 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 a 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 the Westinghouse manufacture. As they turn over slowly visitors can look into the electric lighting crank case through plate glass windows. Nearby on a table are a number of the vital parts upon whose accuracy and long life the success of such high speed diesel engines depend.

MARINE - TOOT PRESIDENT COOLIDGE'S WHISTLE

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 rises in a clear tank of water which concealed pumps set pouring aft at

an approximate scale speed of the original. A faint haze of smoke drifts from the forward funnel. When the visitor touches the whistle button nearby he is answered by white steam from the model whistle with the characteristic type bellow of the liner responding.

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 makers 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 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 remainder of this a very beautiful scale model of the latest of these airships the Macon soars about overhead in a long oval path. The visitor can stop or start it at will by speaking the necessary words of command in a nearby microphone on the floor. The model of the zeppelin is shown by the courtesy of the Goodyear Zeppelin Corporation, whose property it is.

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 reaches 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 was 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 illuminous 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 luminour 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 themselves are panels of a new decorative medium inlaid Micarta showing in color ultra modern designs representing the alternating current which first made electricity idea available, of polyphase which made one universal sort of electricity perform the services which had previously required a dozen, of Niagara which Westinghouse first showed that the cataract power could be tamed, of the steam turbine which set free the generation of electricity unprecedented power, of high voltage railroad electrification which first made it practicable to electrify railroads over considerable distances, and of radio broadcast which as everyone knows Westinghouse originated at KDKA.

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

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 most remarkable possibility now opening out before electricity, the effects of short wave for high frequency current. Here he will see a substantial fraction of a

horsepower 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 other, the invisible"death rays" which are useful in killing weevils in grain and microbes in illness, waves whose therapeutic results create artificial fever that can be regulated at will, benefit stubborn and dangerous diseases and voices and music seen over a beam of light.

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 a 7 watt lamp.

Raw materials for lamps come from almost every part of the United States and this is emphasized by a wall map of the United States and a long case showing the raw materials which come from each section. Next is a micro-projectoscope in which the visitor can peer and see filaments finer than a hair magnified on the screen until they look like a ship's hawser. There is a photometer which shows out 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 himself work by which 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 the exhibit of 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 Worlds Fair, he found himself debarred from the use of Edison's patents which at that time were considered to be essential to a successful incandescent lamp. The "Stopper Lamp" was devised with benefit of Edison's patents and manufactured in great quantities successfully lighted the Worlds Fair, the greatest example of electric lighting which had been accomplished to that time.

TWENTY DOLLARS FOR THE TAKING

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. Within the window temptingly displayed is a twenty dollar gold piece, a plate of cookies and a pair of pliers. Any visitor can have these if he can get them. No matter how fast and carefully the hand is thrust out to grasp them its shadow causes a barrier to rise suddenly from below and protect the treasure within.

HOW HARD IS PAPER TO SEE THROUGH?

Along the wall of this bay the visitor will find a photo electric color matcher by which he can test his own sense of color. Little samples of different colored fabrics and materials put into the slot in the machine are infalibly analyzed and matched. Beside this is an opacity meter which indicates on a scale the opaqueness of paper or other material submitted to it. This is a very important thing in the manufacture of paper especially since print paper should be as thin and at the same time as opaque as possible and it is said that millions of dollars worth of contracts have been placed on the basis of small variation in opacity. Hitherto no satisfactory means of measuring the opacity of paper has existed.

TEST YOUR HEART

The heart beat amplifier is the next device. The visitor holding an electrical ear to his chest will hear the sound of his heart as a loud thud and can see it appear as a wave on the surface of the oscilloscope. This oscilloscope is in fact a magic bottle on whose curves bottom appears in greenish light the wave form of any sound or electrical wave that may be submitted to it.

LIGHTED MATCH GROWLS

Another device served by the oscilloscope is a microphone into which 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. The next device is a noise meter which indicates the loudness of any sound and is of value in machine design and a curious device which converts heat into sound equivalent. 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 by such sensitiveness as to response to the heat of a burning match 40 or 50 feet away but will not be made so sensitive at the Fair because it would be distracted by the warmth of the bodies of the passing crowd.

WESTINGHOUSE AROUND THE WORLD

The next bay overlooks the bridge passing across to the opposite side of the electrical building. Facing this bridge and in the center of the bay is the 5 foot revolving globe of the Westinghouse International Company. On it are listed in modernistic green and black the various countries of the world - Egypt with its pyramids and camels, the ocean with its whales and liners and location of each branch office of the International Company is shown by synthetic jewels glistening in the electric light from above.

ROBOT FIRE-FIGHTER

In one corner of this central bay is the fire scanner which shows the possibilities of the photo electric cell as an automatic fire scanner. On the floor is a sheet iron pit into which balls of flaming waste paper may be thrown. Observing the pit constantly is a "scanner" consisting of a hose nozzle

controlled by an electric eye. It moves right and left and up and down incessantly like a bear pacing its cage. The moment its eye perceives a flame it stops instantly and spurts forth a jet of water which extinguishes the flame. When the fire is out the water is shut off and the electric eye resumes its ceaseless patrol.

VERTICAL PARKING

In the opposite corner is a working model of the parking machine, one of the largest and 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 ones car. It is only necessary to put ones key in the appropriate hole corresponding to that belonging to the subscriber 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 under cover storage the cars are never handled or driven by any one save the owner and are not subject to the fire hazard represented by ttendants. The model which is built on a scale of 1/16 actual size employs model automobiles which are full scale 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.

STRETCHING STEEL BAR WITH BARE HANDS

In this same bay will be 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. The visitor can work it in two ways. There is for example 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. Beside it is a piece of standard steel pipe containing handles by which the visitor may attempt to pull it out lengthwise. Even the amount by which ones unassisted strength can stretch out this steel is shown on the meter nearby. Such extensiometers are used in the elaborate tests on railroad track and locomotive parts recently conducted.

ELECTRIC TASTER

Across the way is another example of extreme exactness. An electric meter which may be said to have a sense of taste, that is it will register the comparative sourness or sweetness of fruit. Two little needle points are thrust into the apple or orange and the meter faithfully indicates how sour it is. Electricity has long since developed the sense of hearing, touch and sight but this is the first example of its developing a sense of taste.

ELECTRIC EYE SORTS CARDS

In the next bay the central exhibit is a card sorting machine, a development of the electric eye. It is a machine actually built for sorting out checks and bill stubs

commercially and can without fail read not only the difference between Aaron and Zqingler but can readily distribute into such subdivisions of the alphabet as may be required. The model on display will sort cards, checks or bills into a score or more of piles but similar machines could be built to sort almost any number of subdivisions.

"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 more readily than any other metal ever discovered to magnetism and 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 science 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.

FEELING THE EARTH'S MAGNETISM

Nearby, is a graphic illustration of the sensitiveness of Hipernik to feeble magnetisms. On a table lie long thin strips of this metal which the visitor can pick up in his hands, touching the tips together. East and West they show no attraction whatever, but if the observer turns so that the strip points north and south their tips cling together perceptably due to the effect of the earth's magnetic pole thousands of miles to the north; and if the visitor then slants the bars so as to be more in line with the invisible magnetism of the earth the tips of the iron metals cling together even more strongly.

SAVES 8 MILLION DOLLARS

Improvement in iron is not a merely scientific curiosity, for practically all the electricity in the United States is handled first and last by transformers, and the amount of electricity which they waste is determined largely by the character of iron by which they are built. Constant research during the last 40 years has made such an improvement in this magnetic iron that were the iron of 40 years ago still in use throughout the country the public would be paying about 8 million dollars a year for the waste of electricity. A vivid example of this is shown by a coil into which the visitor can thrust two samples, first, one of the iron of 40 years ago which causes the pointer of the meter to indicate on its scale the energy wasted in the magnetising of iron, and second, a similar sample of modern iron for which

the meter shows very small losses. A vivid example of the effect of this improvement is shown also by two transformers at the back of the table, one of 40 years ago and the other of today, of the same rating and of strikingly different size.

FLOATING STEEL

Cobalt steel is another vary 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! but 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

But more interesting to the public, is the little heat engine consisting of bi-metal discs on the end of the lever which fall alternately on hot and cold plates and consequently incessantly jump from one to the other. Nearby is another exhibit of bi-metal peculiarities, -- a meter which registers an invisible ray of heat. The visitor can intercept

this ray by raising a barrier whose shadow protects the meter. 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 actually built, and as they would 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 door is a dark room in which 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 is a series of little rounded pearl droplets which can be made 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.

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 held toward the light register the electricity it is making on a meter. 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 work in large powers.

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 and 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". 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 tho little colored obstacle lights which are used to mark the boundaries of an airport and lighting.

SHOOTING DOWN PLANES

On a table were the visitor can play with it is the portable traffic signal of a searchlight work to pistol grips by which traffic in the air can be controlled by ground at airports. By the two pistol grips 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.

ILLUSTRATIONS

217306. A model of the Westinghouse exhibit at Chicago's Century of Progress.

217375. Tremendous crowds flocked to the World's Fair in Chicago forty years ago which left in its wake new social economic and industrial practices. The Forthcoming Century of Progress will probably leave a similar mark upon the American people.

579. Floodlighting on the underneath surfaces of the discs in combination with the rim lighting lends an impression of solidness to the illumination of the columns.

582. Semi-circular discs, 10 feet in diameter, 8 inches thick, and arranged 4 feet apart to form columns, are lighted from within to produce wheels of light of changing colors.

217377. Interior Westinghouse lighting in the Electricity Building at Chicago's Columbian World's Fair forty years ago.

197050. View at night of the Chicago World Fair of 1893 looking south from the Electricity Building. Westinghouse furnished power for lighting.

7. The huge electric mural on the South wall of the Electricity Building at the 1893 Fair, used a total of 2085 - 16 cp. lamps. Different voltages accentuated certain parts of the mural.

597. Dr. A. M. Hageman and Samuel G. Hibben of the Westinghouse Lamp Company, Bloomfield, New Jersey, comparing one of the original "stopper" lamps with an original sketch which George Westinghouse used in the manufacture of incandescent lamps that producted electric lighting for the World's Fair of 1893. Mr. Hibben, who is a member of the Lighting Committee of the Century of Progress, is arranging to have replicas of the "stopper" lamp made for the Westinghouse exhibit at Chicago.

595. A free-hand sketch with specifications in long-hand was penned on a letterhead by George Westinghouse during the excitement surrounding the lighting of the World's Fair in 1893. The original sketch now hangs in the office of Dr. A. M. Hagemen, Manager of Engineering of the Westinghouse Lamp Company, Bloomfield, New Jersey, and will be followed in making replicas of the "stopper" lamp for demonstration purposes at the Westinghouse exhibit during the Century of Progress. The sketch reads:

"This sketch is illustrative. The top of steel mould will form a guide for cutting off lead after driving. The curvature will not be great, so the stopper need not be altered. This will leave the lead thicker in the center. A reamer to finish the mould may be advantageous."

601. An original "stopper" lamp in the hands of H.A. Richtberg, who served George Westinghouse during the World's Fair of 1893, is being compared before the lamp museum in the Engineering Building of the Westinghouse Lamp Company, Bloomfield, N. J. to a laboratory model of the sodium lamp held by Samuel G. Hibben who is a member of the Lighting Committee of the Century of Progress.

218104. At the Century of Progress, visitors will wade around in a sea of light produced by hundreds of these mushrooms.

217362. Silhouettes sweeping around the semi-transparent surface of huge cylinders will portray the history of electricity. The model, built to 1/80 scale, is complete in every detail.

26. Three of the 12 - 1000 hp. two-phase Westinghouse generators which supplied power to the Chicago World's Fair of forty years ago. This exposition was by far the greatest use of electricity up to that time, and the first revelation to the country at large that a universal power system, equal to every requirement was available.

1023. At the 1893 World's Fair two single phase Westinghouse alternators on the same shaft in quadrature, gave two phase power 1000 hp., 2200 volt, 60 cycles.

218345. Mute evidence of why the huge engine driven machines disappeared when Westinghouse introduced the steam turbine - each model represents the same power.

217600. Tesla's high frequency sign at the 1893 World's Fair in foil letters, on glass, energized with 400,000 cycles give this lightning like effect accompanied by a deafing noise.

217774. Sectioned turbine - the tips of the tiny blades travel about 240 miles per hour.

218348. Model of the first commercial turbine - 400 kw. A.C. unit installed in 1899.

25. The spinning iron egg in the center was a physical demonstration of the rotative effect of Westinghouse's polyphase current, at the 1893 Fair. Two pairs of coils energized with 200 amperes, 90° out of phase, 60 cycles - about 40 hp. was absorbed in this ring.

217387. "Alternating Current", the electricity used daily in the nation's homes, is the theme of this inlaid micarta mural.

217559. A seven foot paper machine model patterned to 1/16th scale after a huge Fourdrinier paper machine which can turn out paper 204 inches wide at a rate of 1500 feet a minute or 240 tons a day.

196639. 218370. A model of the President Coolidge, complete in every detail will be exhibited - visitors may even toot the whistle.

217313. Model of a Westinghouse Pennsylvania passenger locomotive. The young lady is inspecting the pantograph.

217182. L. J. Hibbard, Westinghouse Special Railway Engineer, examining the model locomotive built for the World's Fair.

217183. This locomotive, although built on a scale of 1:15, is accurate in every detail of construction. This workman is assembling the brake mechanism of the locomotive.

218346. Streamlinging for trains is being carefully studied by such models as this.

217431. Story of railway transportation told in Micarta Mural.

217528. The nine foot model of the U.S.S. Macon is an exact reproduction of the airship itself. This photograph shows the separate gas cells and taken during the model's construction at the Akron Plant of the Goodyear Zeppelin Corporation.

217527. Dr. Hugo Arnstein, vice president of the Goodyear Zeppelin Corporation is shown with the complete model of the Macon.

217578. One exhibit at the Century of Progress will demonstrate how short-waves can be projected, reflected and received.

217584. S. M. Kintner shown measuring the 9 centimeter wave of the short wave outfit which will be demonstrated at the Century of Progress.

217592. Broadcasting via ultra short wave - transmission is possible only between points in line of sight.

217593. The receiving end of ultra short wave transmission.

21. Lighting lamps without wires. At Chicago's World's Fair 40 years ago, Tesla's spectacular demonstrations with high frequency in this room laid the ground work for many modern developments.

217765. This disc turns daylight or the flare from a match directly into electricity which registers on the meter.

217763. Heat from the body, or a match, makes this loud speaker purr or growl.

217773. Sensitive Bi-metal which responds to intercepted heat rays.

217754. Heat Engine - Two pivoted bi-metal discs, alternately resting on ice-cold and red hot surfaces, flip-flop back and forth.

218367. Shining a flashlight on the proper target, opens the doors of this cabinet disclosing metals of the future.

Note to Editor:

Photographs or electrotypes will be supplied upon request.

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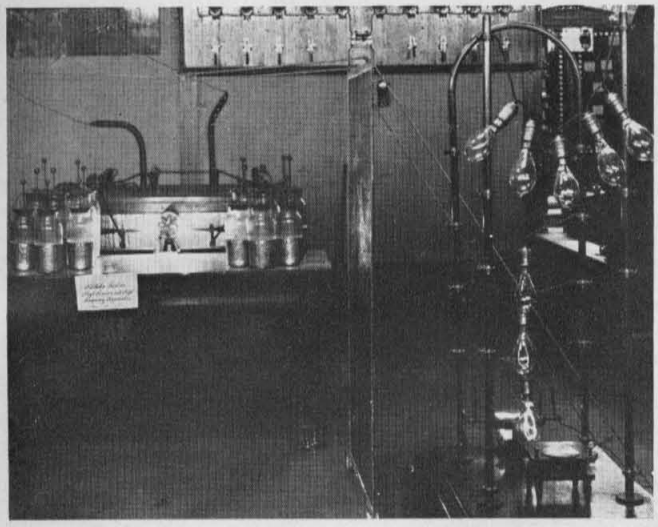

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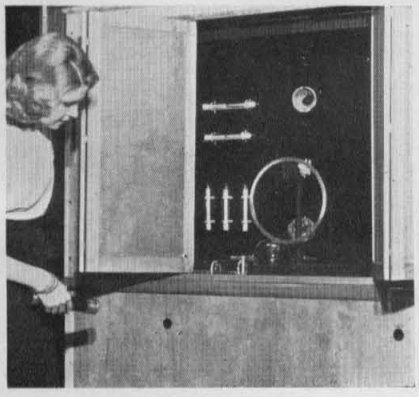

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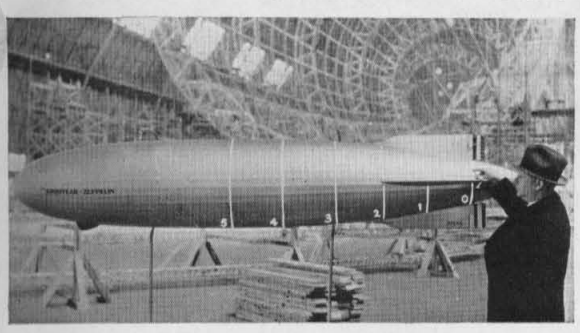

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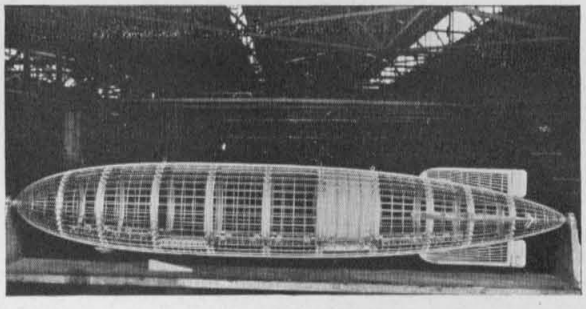

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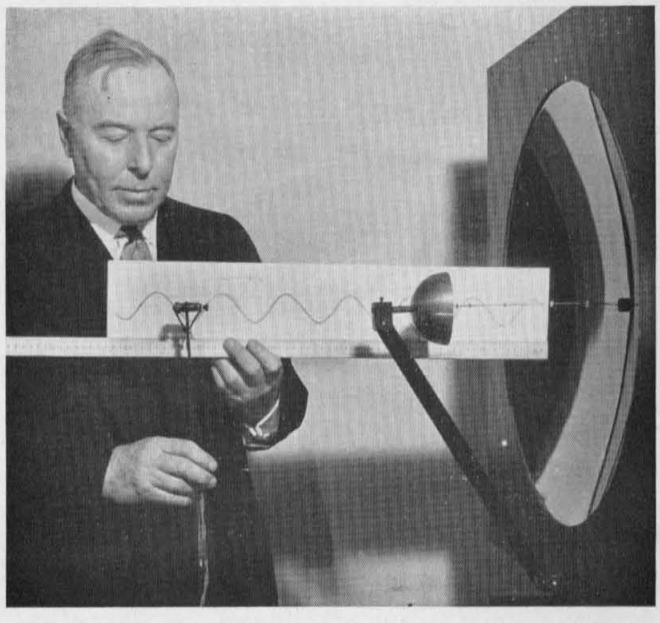

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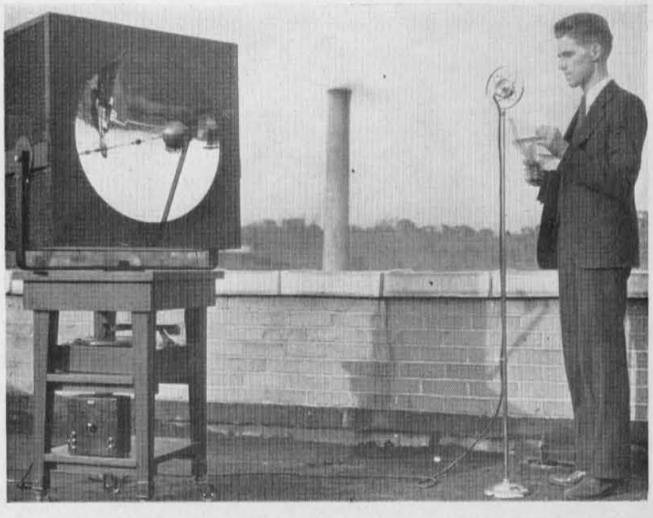

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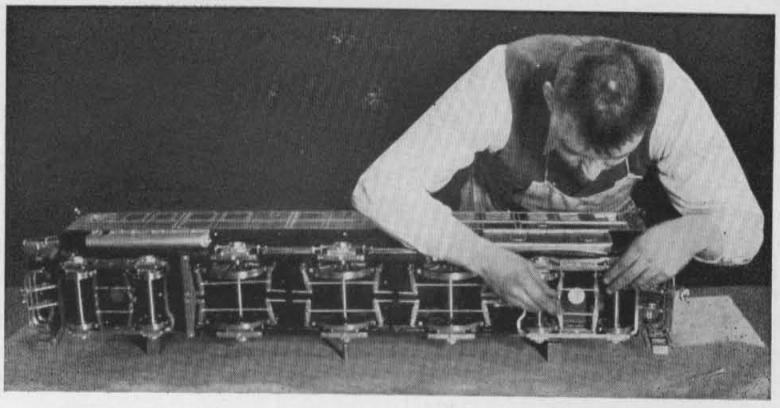

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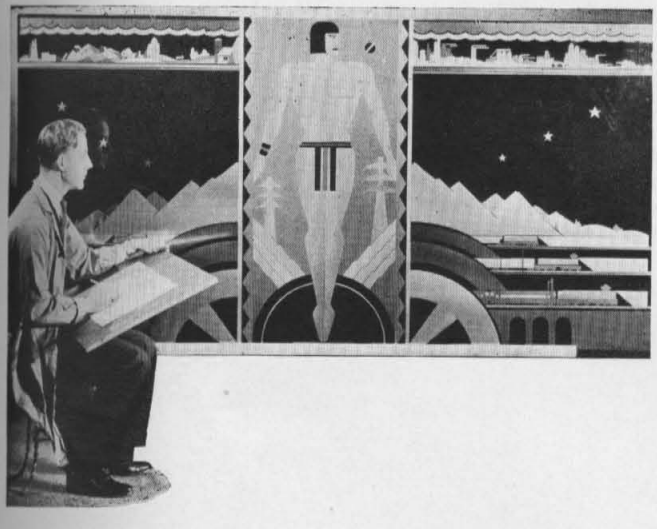

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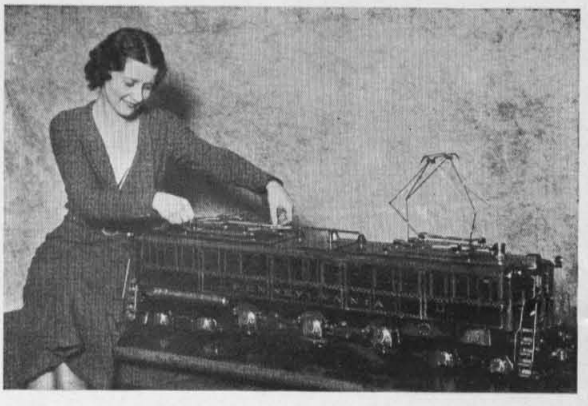

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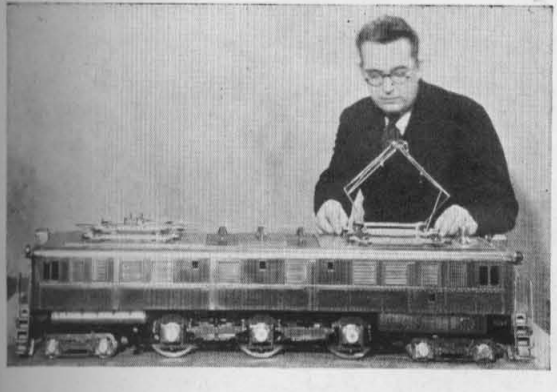

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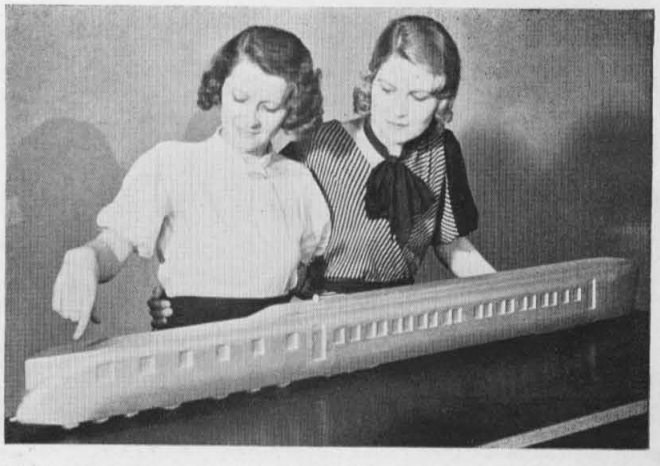

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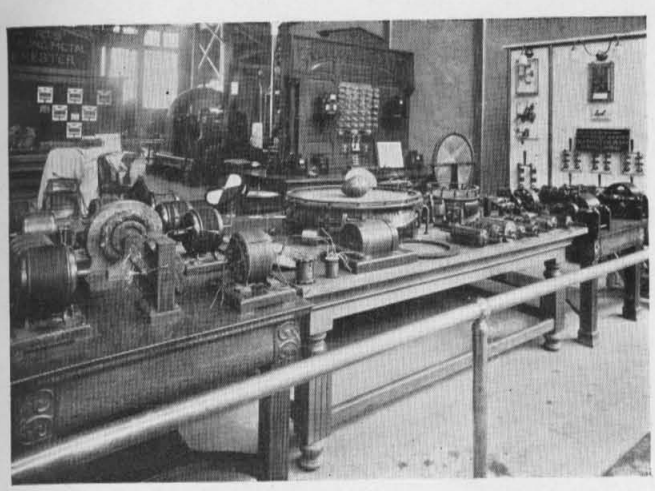

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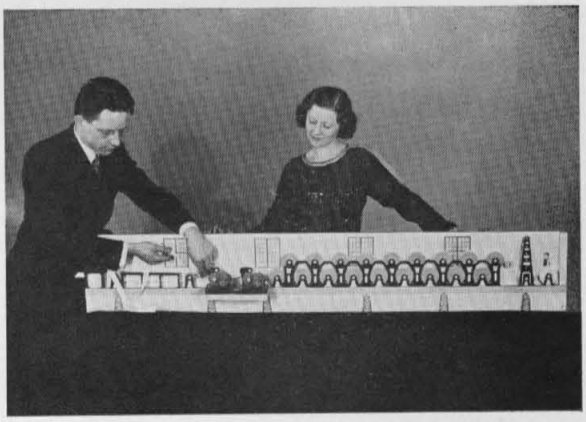

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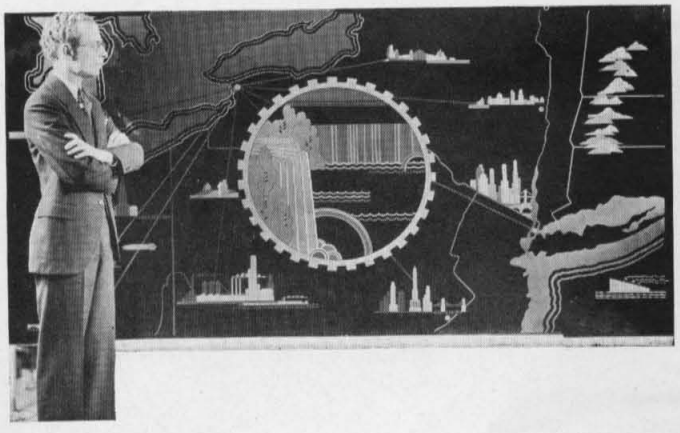

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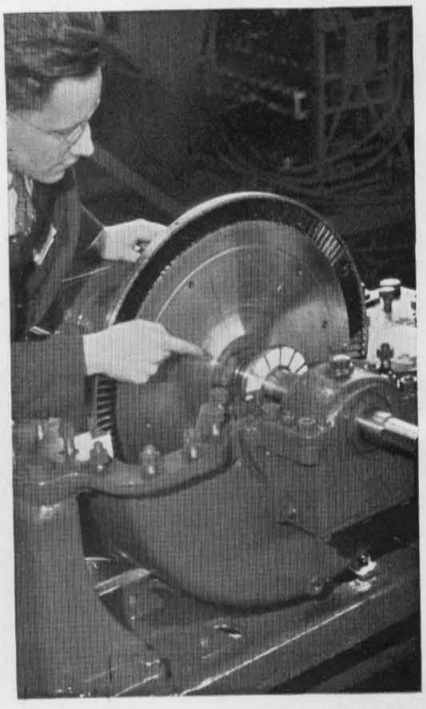

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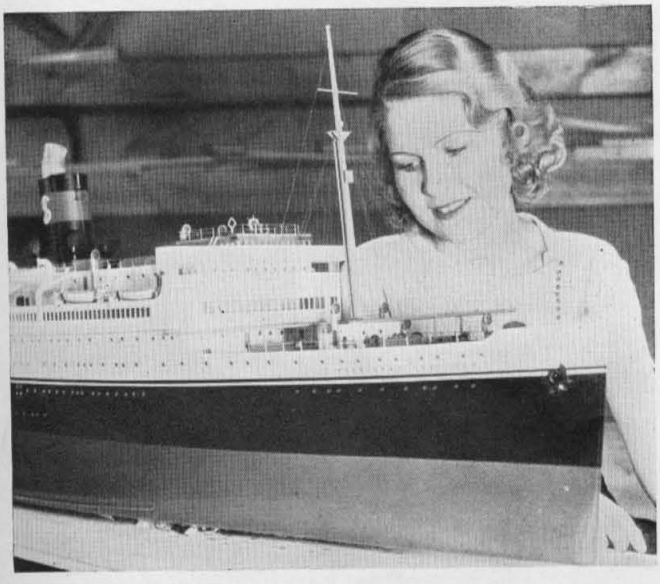

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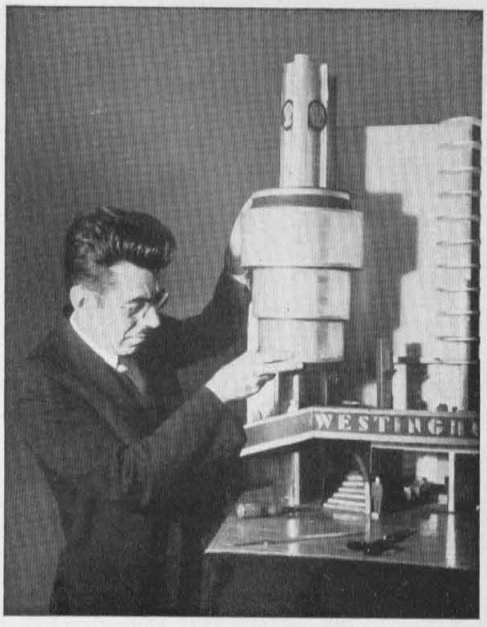

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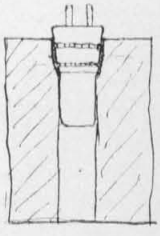
Westinghouse Electric & Manufacturing Company,

120 BROADWAY,

NEW YORK, N. Y. 193



This sketch is illustrative
The top of steel mould will form a guide for cutting off lead after drawing
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A manner to finish the mould may be advantageous

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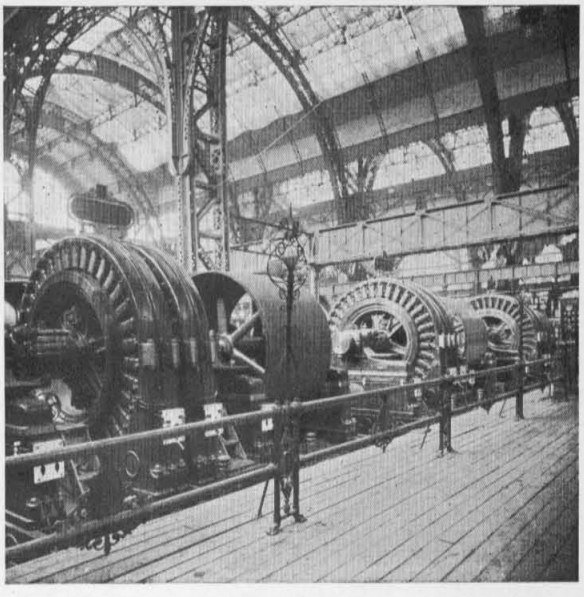

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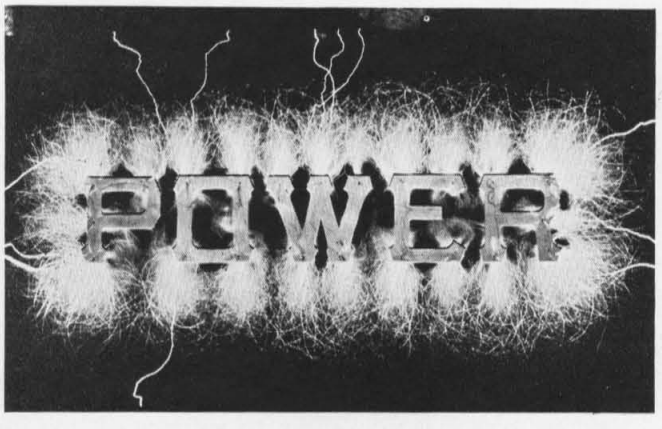

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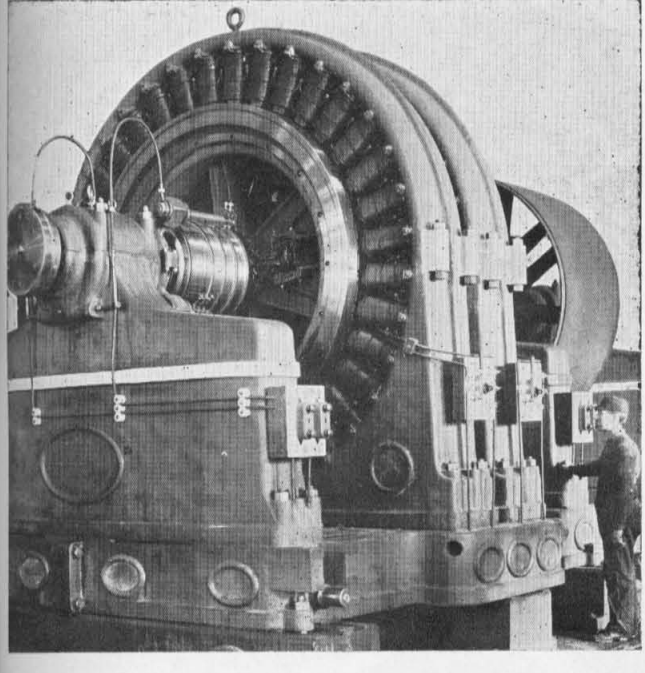

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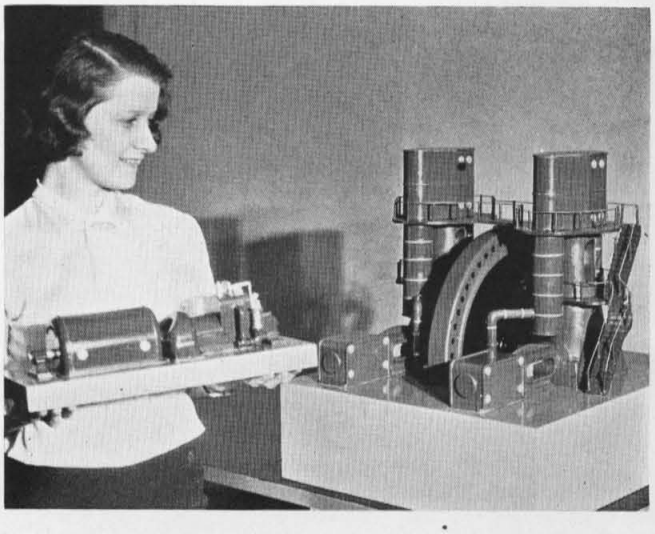

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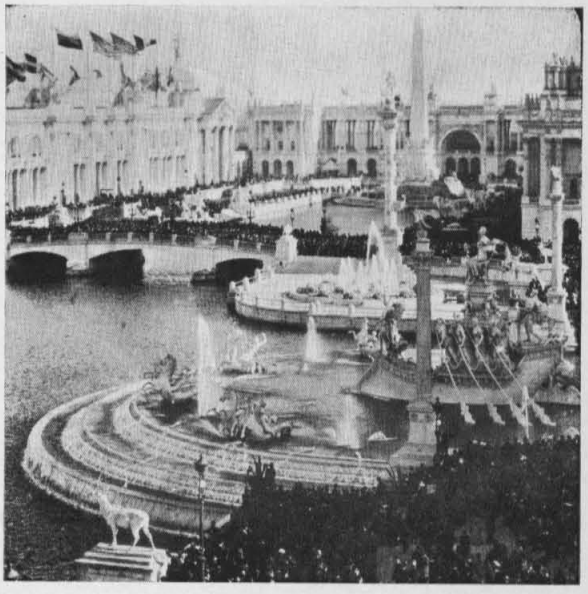

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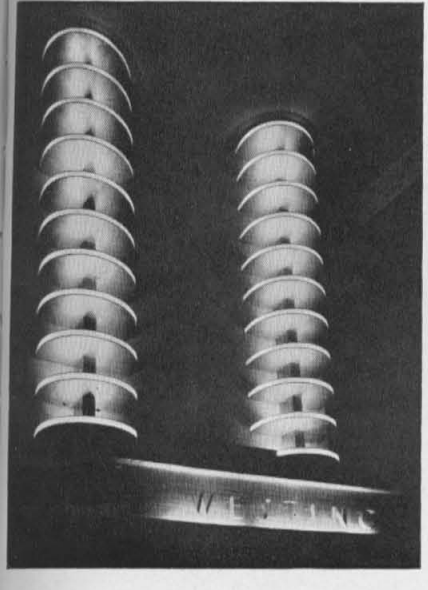

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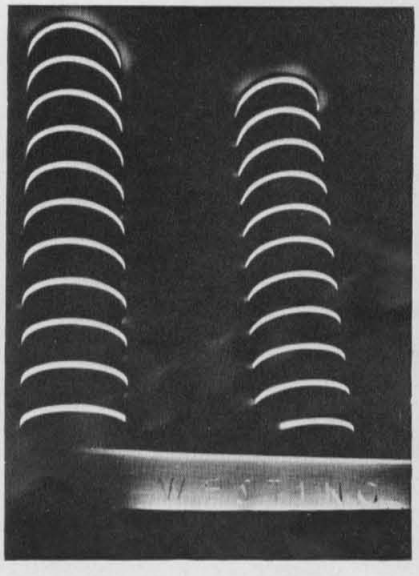

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