



SPECTACULAR LIGHTING OF WESTINGHOUSE EXHIBIT AT CENTURY OF PROGRESS
RELEASE

"Phonograph" Records Play Lighting Melodies

By Charles J. Stahl,
Special Illumination Engineer

Westinghouse Electric & Manufacturing Company

To the observer's first glance the Westinghouse exhibit at "A Century of Progress" is decidedly an exhibition of modern lighting accomplished by the use of mobile color effects. There is in this lighting no commonplace repetition of what has been done before and there was practically no precedent on which to reach conclusion or on which to base calculations that would assure the designers of satisfactory results in the aggregate. It was necessary to construct a section of the design to full scale in order to verify judgment based more on many years of experience than on definite calculations. At this Exhibition, lighting experts will probably find if not the entire history, at least the finale of "A Century of Progress" in lighting.

CURVED HALL COMPLICATES LIGHTING PROBLEM

The curvature of the wall, which forms the background is the outer wall of the great circular portion of the Electrical Exhibits Building. In order to support large roof area, this wall had to be built structurally strong which accounts for the fact that there were nine unsightly fabricated columns extending out from the wall into this exhibit space a distance of 32 inches. This made necessary some treatment to conceal these fabricated columns. After making a scaled model of the interior and much study in collaboration with Mr. Louis Skidmore, Assistant to the Director of Exhibits in Charge of Designs, finally led to a satisfactory treatment serving both for a lighting subject

and to obscure the unsightly columns. Semi-circular discs approximately 10 feet in diameter were placed on the columns and the sections of columns exposed to view between the discs were encased. The discs, having an outer edge approximately 11 inches in height, provide housing space for floodlights so that the under surface of each disc is lighted from floodlights concealed in the next lower disc.

WHEELS OF LIGHT FORM COLONADES

Running horizontally across the bottom of the colonnade of discs is a shelf which conceals floodlights provided to illuminate the panels of wall space between the columns of discs in colors contrasting with the colors on the discs. To provide architectural stability in the pattern by having a fixed outline which remains unchanged in the field of mobile colors, the edges of the discs are painted black. The under surface of each disc is white to respond fully to the lighter colors here applied, namely: red, yellow and green and the blends obtained by mixing these colors in the overlapping dimming cycles. Blue, green and red are applied to the panels. Here a lower intensity and less vivid color is desired for a proper background depth also to avoid washing out certain herringbone and other interesting effects of shadows and color blends caused by the light from the floodlights within each disc being not entirely intercepted by the next higher disc.

LIGHT BLUISH-PURPLE BEST BACKGROUND

Experiments were also made at the Cleveland Works and at Exposition Headquarters to determine what color of background would be most effective. These experiments lead to the use of a white casien paint, a dextrine glue, with a little blue pigment

and a trace of red pigment. In other words it was found that a light bluish purple responded best to the colored light as applied to the panels. Matt drying paints were used to avoid specular reflections and to obtain pastel qualities in the lighting effects. The ceiling was painted matt black.

In each disc there are 15 floodlights with white porcelain enameled reflectors. Five of these have yellow lenses and 75 watt lamps, five have red lenses and 100 watt lamps and five have green lenses and 100 watt lamps.

For the lighting of each panel between two columns of discs there are concealed in the lighting shelf 12 floodlights in two rows of 6 each. These have chromium plated reflectors. In the row nearest the wall there are six wide beam floodlights providing - red 1000 watts, green 1000 watts and blue 2000 watts, which illuminate the lower portion of the panel. In the outer row there are six narrow beam floodlights providing, - red 1000 watts, green 1500 watts and blue 2000 watts. These floodlights have rectilinear spread lenses of colored glass and are adjusted to illuminate the upper reaches of the panel.

"PHONOGRAPH" PRODUCES CHROMATIC HARMONY

The mobile color control is accomplished by the most modern device for this purpose. Briefly, the equipment consists of reactors controlled by the use of thermionic tubes and potentiometers, the latter being in contact with metallic ribbons placed on the usual type of phonograph discs in such a manner that the grid bias varies as the disc rotates. The time - intensity curve for each color is thus predetermined by the trace of the metallic ribbon contact and the color program, both as to intensity and overlapping color blends, may be changed at will

by simply inserting a new record with the metallic ribbons differently arranged. This "Phonograph" producing chromatic instead of phonetic harmony is in the view of spectators and forms a part of the exhibition of many novel innovations and scientific developments perfected in recent years by engineers and scientists. This thermionic control is similar to that for the great Buckingham Fountain in Grant Park, Chicago, and in Severance Hall, Cleveland.

LIGHTING CONFORMS WITH ARCHITECTURE

With the modern control equipments now available there is no conceivable limit to the variations and combinations obtainable. It was recognized that there would be no great difficulty in having successive bands of light and color move vertically up the columns and that such motion could also be made to progress horizontally from column to column. Either regular color succession as in the rainbow or a pattern of kaleidoscopic nature could be introduced. Such color mobility is particularly beautiful in fountains. However, in an architectural subject, which is to be suitably embellished by the use of color, elaborated motion is not often becoming. When the architectural expression is one of static permanence, great durability and strength, it is not fitting to have blocks of color either jumping or gliding from place to place. The lighting control in this exhibit is, therefore, confined to the changing and blending of colors such as takes place at the rising and setting of the sun. All green floodlights in the discs are connected to the same control circuit and are brightened or dimmed in unison. The same is true of the yellow and red floodlights in the discs. This is also true of the floodlights for the panels. However, their control is

independent of the discs so that color changes may take place in either the discs or the background independently and in contrasting colors. In general the darker tones of purple, blue and green are applied to the background.

LIGHTING THE MEZZANINE

Most of the scientific exhibits are on the mezzanine floor. Some of these are in such form that localized lighting had to be provided to supplement the general illumination obtained from reflector units delivering light downward through holes in the lighting shelf. Above this shelf, which, as already explained, houses also the floodlights for the colored lighting of the panels, is the expansive background area of panels and discs. This area is most of the time illuminated in several colors which from their aggregated reflections produce approximately synthetic white light. So that while the discs and panels are in ever-changing and contracting colors the light reflected downward from their matt surfaces contributes substantially to the illumination of the entire interior.

TOWER OF HISTORY USES SPECIAL LIGHTING

Almost the complete repertoire of the illuminating engineers' art is employed in the Westinghouse exhibit. At the north end there is a large vertical show case, cylindrical in form, surrounded by a circular stairway leading to the mezzanine floor. As the visitor ascends this stairway merchandise displays are seen in this show case. Above it are three other large cylindrical forms of translucent material on the face of which, in silhouette, the observer sees a moving pageant historically depicting the development of the use of electricity. The three translucent cylinders forming this tower of history are placed

one above the other. The diameter of the lower cylinder 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 10000 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, Nurnst lamp, enclosed arc lamp, mercury vapor lamp, flaming arc lamp, tantalum lamp and the modern Mazda lamp.

The second cylinder depicts the development of transportation from the old fashioned locomotive to the present locomotive, subway cars, diesel electric locomotives, interurban cars and trolley buses.

The third cylinder depicts the development of industrial power from the old fashioned water wheel to the great gas engines and steam turbines of the present day, including also the steel mill motor and portable electric tools.

LOUVERED CIRCLE W SPILLS NO LIGHT

Still higher, for the ceiling is 71 feet above the floor, is a large Circle W trademark of modernistic character. The louvered form was developed so as to have this "W" appear in luminous orange color and at the same time to prevent spilling excessive light on the adjacent background and thus washing out the blending color effects there produced. The louvers forming this letter are illuminated from lamps within the letter. Orange colored tubular lamps are employed in order to have from the lamps only the useful light that responds to the orange color of

the louvers. The construction of the "W" is such that sections can be removed for access to the interior to facilitate cleaning and the replacement of lamps.

LATEST UTILITARIAN LIGHTING

Next to the circular show case on the ground floor is the refrigerator exhibit in a separate room simulating the merchandising store of a dealer in Westinghouse refrigerators. A feature is the blending color lighting scheme which illuminates the wall back of the display in gradually changing colors from concealed floodlights.

The next room is a modern kitchen and next to the kitchen is a model laundry. Both represent the latest developments in the use of electricity to do household work. Here the lighting is of a simple design entirely for its utilitarian value.

AN ULTRA-VIOLET SPECTACLE

At the south end of the exhibit is, to all appearances a very large transformer. It is in fact a full scale model of the most powerful transformer ever built. Its tank serves as a chamber where approximately twenty visitors at a time may observe interesting effects produced by the use of ultra-violet radiation from the latest ultra-violet lighting equipment developed at the Cleveland Works in connection with ultra-violet glow lamps recently developed at the Bloomfield Works of the Westinghouse Lamp Company. When illuminated by ordinary light a series of posters and decorative wall coverings are observed but when the ordinary light is replaced by black light" from ultra-violet lamps, the wall coverings become luminous designs effecting under water life and the observer is amused by the extraordinary effects of lum-

inous decorations on rotating fan blades and other furnishings. In this dark room are also displayed various dual purpose luminaires from which ordinary light and ultra-violet light are obtained. These are in the form of floor lamps, torchiers and various types of health lamps and therapeutic lamps recently developed at the Cleveland Works of the Westinghouse Company.

WIRELESS POWER PRODUCES FEVER

Having already progressed in demonstrating the use of radiant energy of wave lengths beyond the range of the human eye, the exhibit now goes a step further into the region of another band of short wave length used in the transmission of high frequency electric energy. On the mezzanine floor, where many scientific developments of interest are exhibited, the visitor sees demonstrated wireless transmission of electricity in substantial amounts. A motor is operated by this energy and electric lamps, with no attachments, burn when held in the visitor's hand. Here are the invisible "death rays" and wireless power which causes artificial fevers. A feeling of warmth is created in any part of the body without affecting other parts and voices as well as music are transmitted over a beam of light.

Note to Editor:

At the visitor's first glance of the Westinghouse exhibit at "A Century of Progress" he is captivated by the lighting effects. As he progresses he is impressed that here lighting from its simplest form, as utilized in the modern kitchen, is advanced far beyond the doldrums of commonplace effects. It becomes obvious that the increasing benefits to mankind thru progress in artificial lighting is rapidly approaching the goal for which scientists and illuminating engineers have been striving and, furthermore, that this progress is going forward at an ever increasing rate.

Captions for illustrations:

218859. The Westinghouse Tower of History.
218857. Lamps of 3000, 5000, and 10000 watts respectively illuminate historical silhouettes on the 14, 16-1/2 and 19-foot diameter rotating cylinders.
218858. Illuminated underneath glass, a full scale cross-section of a 70,000 kv-a. waterwheel generator rotates slowly. Micarta murals in the background portray electrical progress.
218855. General view of the Westinghouse exhibit,
218856. as seen from the South end of the hall. Research displays are on the mezzanine.
217377. There is sharp contrast between the Westinghouse lighting at the Chicago World's Fair in 1893 and the modernistic lighting Westinghouse is using in the current Century of Progress.
7. The first electric mural. It was constructed on the South wall of the Electricity Building at the 1893 Fair, using over 2000 16 cp. lamps.
217600. Westinghouse-Tesla high frequency sign at the 1893 Columbian Exposition. Tin foil letters on glass, energized with 400,000 cycles gave this spectacular effect.

Note to Editor:

Photographs or electrotypes will be supplied upon request.

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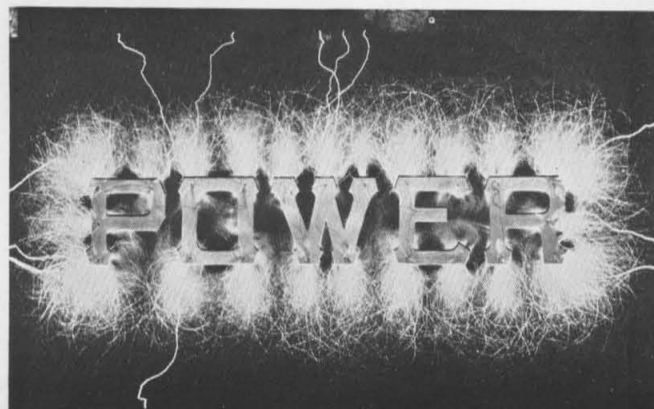
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