

National Electrical Exposition Notes.

The second week of the exposition finds the whole exhibit in good working order, and the somewhat dim illumination of some of the side aisles, which was noticeable at the opening, has given place to a blaze of light which is fully up to the level of the rest of this excellent display. The great advance which has been made of late in the manufacture of arc lamps is evident from the perfect steadiness of the lighting; and the visitor is also struck with the endless variety of devices for softening and for diffusing the light. Incandescent lamps are shown in soft and pleasing colors, and the display of arc lamps proves how much can be done to render them beautiful, not merely in color, but in the shape of the globe and details of the fittings. The George A. Macbeth Company, of Pittsburg, Pa., exhibit some varieties of what they call the holophane, a glass globe which is cut into a series of concentric angles on its outside surface and on the inside is cut into radial angles. The light is caught and refracted by these angles until the whole surface is brilliantly aglow.

It is unfortunate that a larger percentage of the visitors do not inspect the light and power room on the first floor. It is now in full running order, and, as an exhibit of the best and latest practice, it is a valuable object lesson for the electrical engineer. The Siemens & Halske dynamo, with its outside armature, will attract attention. It is a 100 kilowatt machine, direct connected to a 150 horse power Ball & Wood engine. It is run at 250 revolutions, and the smoothness and silence of the running are remarkable. This engine is built with a telescopic valve, designed to take up the wear. A small model of the valve is shown and explained by the attendant.

Next to this stands a Phoenix horizontal tandem compound engine, direct connected to an 80 kilowatt Walker generator. The high pressure cylinder is in front and the low pressure cylinder is bolted to a sub-base. The arrangement is compact and facilitates repairs.

What may be called the popular side of the exposition has been well provided for; and one of the most popular exhibits is that of the Practical Laboratory, which is under the supervision of Mr. Max Osterberg, of Columbia College. Practical demonstrations are made of the various principles of electricity. An arc light is seen burning under water, and this experiment is shown with the apparatus made by Prof. R. Ogden Doremus, of the College of the City of New York, Bellevue Hospital, and used by him in a lecture at the Academy of Music in 1856. The electrolysis of water and the electro-magnet are popularly explained, and a machine is seen in operation which illustrates the action of Fuco's currents.

On the same floor is an extensive exhibit of machines designed by Elihu Thomson, which has been brought over from the Thomson-Houston factory, Lynn, Mass. This contains, among other objects of interest, an oscillating type watt meter; the original welding transformer; a case of three dozen photographs of past and present transformers; and several examples of electric welds, including 3 feet of $\frac{1}{4}$ inch welded chain, there being two welds in every link, a welded band saw, and a plate iron lap riveted joint, in which the rivets are practically welded into place. There is also a fine exhibit of Mr. Thomson's arc lights of the original T D and K type, and of dynamos built in 1876 and 1878.

Before leaving this floor, a visit will be paid to the exhibit of the electrical wonder of the hour, the Roentgen X rays, which are shown by Mr. Edison by means of his fluorescent screen. The crowd of sightseers is passed in single file into a dark room, where the screen is arranged inside a railing, in much the same way as an ordinary ticket window. The crowd passes one by one, in front of the screen, which is about 18 inches square, and the hand is passed up within the screen and placed against it. The current from the powerful Ruhmkorff coil, of 25,000 volts, is turned on, and immediately the screen glows with a pale light, upon which is seen the ghostly shadow, or shadows, of the hand, the flesh showing up in faint shadow, the bones in darker shadow, and the ring, if one is worn, showing out in black. One must confess that a result which is merely interesting on paper becomes a little gruesome when seen through one's actual living flesh. The arrangements were so well carried out that, in the course of an hour, some four or five hundred persons must have taken a look at their anatomy.

On the main floor, the latest developments in the manufacture of wire and cable and various improved methods of insulation are shown at the two booths of the Safety Insulated Wire and Cable Company and the Washburn & Moen Manufacturing Company. A curiosity in the latter exhibit is a coil of copper wire which is $15\frac{1}{2}$ miles long and weighs only a trifle over 2 pounds. The wire is $\frac{29}{100}$ of an inch in diameter.

The John A. Roebling's Sons Company show a bi-metallic wire—a steel core with a copper jacket—which combines the conductivity of copper with the strength of steel. A wire, $\frac{3}{16}$ of an inch in diameter, has a strength of 5,700 lb., and weighs 1,620 lb. per mile.

Across the way from these booths will be found a

display by the Fort Wayne Electric Company. They show a single phase alternating current motor, of 10 horse power and 16,000 alternations; also a 5 horse power single phase alternating motor driving a 7 kilowatt bipolar 110 volt dynamo.

The attendance at the exposition has been very gratifying and is increasing.

A NATURAL MOUSE TRAP.

Mr. W. H. Marris sends us the following curiosity, says the Amateur Photographer:

From time immemorial the mouse has been classed with the pests with which mankind has had to deal. The little animal has three leading and discreditable characteristics, i. e., thief, trespasser and destroyer of property. It is therefore not surprising that human ingenuity has been ever actively employed against the unwelcome creature's life.

Besides the chemist with his poisons, and the wood and wire workers with their clever devices, the mouse has had a natural foe in the cat; but notwithstanding all kinds of snares, mice are not yet exterminated. But since the creation there has surely not been known a more curious enemy to mice than the one that has recently distinguished itself at the fishing metropolis (Grimsby), on the night of March 28.

An oyster was on that day placed on a pantry floor, and during the night (feeling thirsty) it opened its shell. Three silly, wandering mice were near too, and smelling fish, all placed their heads just inside for a taste. This intrusion was instantly resented by the occupant of the shell, and hastily yet silently a relentless grab was made, and those foolish mice were suddenly executed prisoners.

Such a thing has been known on oyster boats here



OYSTER AND MICE.

as the capture of a single mouse by an oyster, and rats have suffered injuries to legs, etc., but the trapping of three mice simultaneously is a record for an oyster, which I think at present is acknowledged a unique feat.

Has the oyster firmly conspired to oust the cat from the legitimate occupation for which it has so long been renowned?

Thanks to the art of photography, our readers are able to see an exact picture of the captor and the captives just as found.

New Method for Measurement of High Temperatures.

M. Daniel Berthelot has devised a plan for the measurement of high temperatures which depends on the refractive index of the heated gas. It has recently been ascertained that if you bring a given gas to a given density it will have the same refractive index whether you reach this result by varying the pressure or the temperature or both, says the Progressive Age. Consequently, M. D. Berthelot takes two tubes, along which he passes two beams of light obtained by splitting up a beam of light from a single source. When these two beams are made to fall on the same spot, they produce certain fringes, due to interference. If one of the tubes be heated, these fringes are displaced; but they can be brought back to their original position by varying the pressure in the colder tube. This alteration of pressure then produces exactly the same alteration of density in the colder tube as is effected by the heat in the hotter one; and this enables the temperature in the hotter tube to be calculated. After settling that this could be done, M. Berthelot proceeded to simplify the method by working with only one tube, filled with ordinary air; and he expects to be able to make the method one capable of being readily applied for manufacturing purposes.

Notice.

A premium of \$250 is offered by the SCIENTIFIC AMERICAN for the best essay on
THE PROGRESS OF INVENTION DURING THE PAST FIFTY YEARS.

This paper should not exceed in length 2,500 words. The above-mentioned prize of \$250 will be awarded for the best essay, and the prize paper will be published in the Special 50th Anniversary Number of the SCIENTIFIC AMERICAN of July 25. A selection of the five next best papers will be published in subsequent issues of the SCIENTIFIC AMERICAN SUPPLEMENT at our regular rates of compensation.

The papers will be submitted for adjudication to a select jury of three, to be named hereafter.

Rejected MSS. will be returned when accompanied by a stamped and addressed envelope.

Each paper should be signed by a fictitious name, and a card bearing the true name and the fictitious name of the author should accompany each paper, but in a separate sealed envelope.

All papers should be received at this office on or before June 20, 1896, addressed to

Editor of the SCIENTIFIC AMERICAN,
361 Broadway, New York.

Correspondence.**The New Hudson River Bridge.**

To the Editor of the SCIENTIFIC AMERICAN:

Your beautiful illustration of the proposed new bridge over the Hudson River at New York, in the May 2 number, excites everywhere intense interest.

The central span, 3,254 feet, may, perhaps, be impossible to diminish, but the cost of the bridge itself, \$25,000,000, could certainly be diminished one-half, for it is intended that there shall be six railroad tracks, and the bridge be strong and heavy enough to carry all the tracks, loaded with trains (including, of course, 100 ton locomotives) from end to end, or a total live load equivalent in weight to 30,000 tons.

May I not modestly suggest to the engineering fraternity that by limiting it to two tracks only (or four at most) with two or four cars to each train and no locomotives, the bridge would be perfectly capable of doing all the work and even more than the system as at present proposed, at the same time the cost could be diminished to within eight or ten millions, and make a much stronger and more beautiful structure.

Strickland Kneass, Esq., the engineer of the Pennsylvania Railroad some seven or eight years ago, deferred recommending such a structure to Thomas A. Scott, then president of the Pennsylvania Railroad Company, because his estimate of eight million dollars for the cost was too stupendous to undertake, and that included taking one hundred acres of the southerly end of Central Park for a grand international depot.

HENRY DAY.

New York, May 8, 1896.

Valuable Patents.

American inventors will have their ambition excited by the recent sale, by the Diamond Match Company, of Chicago, Illinois, of patent match making machinery and rights to European governments. That company received \$600,000 from the French government and \$800,000 from the Italian government, and it is reported that they will receive similar sums from Germany, Austria-Hungary and other countries, says the American Woodworker. Five years ago the science of converting logs into matches was said to be a finished science, incapable of further improvement, but American ingenuity has shown that what was "perfect work" in 1891 will not answer for 1896. Even now the machines used in making matches, wonderful though they are, are not to be left unchallenged, as inventors are working on new ones, whose capacity will, they claim, far excel that of the best machines now in operation. He is a bold, or a very ignorant, person who will in these days assert that any process, tool, machine or device is incapable of further improvement. There may be, there are, many absolute failures in the works of the inventors, but it is an open truth that there are many satisfactory successes also, and that through the labors of these ingenious persons everything in the shape of machines is gradually coming to a higher plane.

On April 20 Senator Cannon introduced a joint resolution which if it is enacted into law would give the city of Washington a remarkable attraction. Mr. Cannon proposes to have constructed an enormous map of the United States showing every hill, mountain, valley, river, lake, village, city and railroad. All this is to be done in miniature, but on such a scale as will give a map about two-thirds of a mile in length by one-third of a mile in breadth. The map is to be constructed on such a scale that one foot of map surface would represent one square mile of the actual area. The proposition is a serious one, although it is not likely to be received as such. The value of such a map would be very great.