

fect mechanism of the steam engine, dynamo builders have been building machines which do not require such high rates of speed as were formerly demanded, both because of improved design and construction as well as because of the increase in size.

The electric generating plants at the World's Columbian Exposition fully demonstrate the latest practice in this country in direct connecting. Six of the Westinghouse alternating current dynamos, each with a normal capacity of ten thousand incandescent lamps, will be direct-connected to Westinghouse compound engines of one thousand horse power each. Near by, in the power plant in the Palace of Mechanic Arts, the General Electric Company exhibits a vertical triple expansion engine direct-connected to two Edison multipolar power generators of five hundred horse power each. These two plants, each of which is of unusual capacity, demonstrate the adaptability of direct connection with vertical types of engines, while in the power house of the Intramural Railway is a direct-connected plant in which the engine is of the horizontal type. The engine in this case is a two thousand horse power cross compound Allis engine of the Corliss type, and the armature of a fifteen hundred kilowatt Thomson-Houston multipolar railway generator is built up on its shaft. With the claims for economy that are made for direct-connected plants, it would be instructive if these three installations were so arranged that they could be tested under different steam pressures, so as to ascertain the point of their highest economic working efficiency.

There are other direct-connected sets at the Exposition besides these mentioned. They are exhibits and not part of any plants in actual operation, but they all go to show that the plant designed and exhibited by Mr. Edison fifteen years ago was on the correct principle.

THE POST OFFICE OF THE COLUMBIAN EXPOSITION.

The model post office established in the World's Columbian Exposition grounds by the United States Post Office Department is now in full working order, and has been used since the middle of April. This office is a branch of the Chicago post office, but is known as the World's Fair Station, and all visitors at the Exposition who have no definite knowledge in advance as to what their address will be in Chicago may have their mail sent to this station by addressing it "World's Fair Station, Chicago." This office is situated in the southwestern corner of the United States Government building, and its general arrangement is in all respects highly convenient. At the extreme left is the private office of the superintendent of the station, then in consecutive order are windows as follows: Two "Carriers' Delivery" windows, two "General Delivery" windows, one "Registered Letters" window, one "Money Orders" window, one "Stamps Wholesale" window, one "Stamps Retail" window, and at the right hand corner an "Inquiry" window. Between the carriers' windows and the general delivery windows are about one hundred lock boxes which will be rented, but there are no call boxes. Near the right hand end are four slips for mailing letters, one each marked "North," "South," "East" and "West." Besides these there are slips marked "Packages," "Papers," "City" and "Foreign."

This office has about twenty-five postmen in the delivery service, and there are four deliveries of mail a day, mail being delivered at all the State buildings and foreign buildings as well as at the Exposition buildings. By this arrangement visitors from any particular State can, if they so choose, have their mail delivered at their State building, provided their State has a building. The service of this office, including the mail delivery, belongs equally to Midway Plaisance as to the Exposition grounds proper.

At the right of this post office is a model postal car with all its equipment complete. A full working model of this car, one-sixth in size, is also exhibited. In this connection the Post Office Department makes a complete exhibit of the various ways of carrying mails in addition to this postal car. There is a mail carrier on horseback with his equipment, a sled to which three dogs are harnessed, showing the manner in which mail is carried in the winter in extreme cold regions. There is also the Indian mail carrier on snow shoes, a "special delivery" boy on a bicycle, a fine model of the steamship City of Paris, also a model of the side wheel steamer Southern, of New York, the first steamer that ever carried the United States mails. There are also two wax figures of postmen in full uniform, together with a full and complete display of mail bags and pouches of all kinds, etc.

FOR BROWNING BLUE PRINTS.—Dissolve piece of caustic potash as big as a soup bean in 5 ounces of water. Place print in this solution, and it will fade to orangeyellow. When all blueprints have disappeared, wash print thoroughly in clear water. Then dissolve a partly heaped teaspoonful of tannic acid in 8 ounces of water. Put the yellow prints in this bath, when they will turn to a brown that can be allowed to assume a tone of any required depth. Then wash well and dry.



THE OPENING ON MAY 1.

The World's Columbian Exposition was formally opened at noon on Monday, May 1.

From the day work was begun on the Exposition, the amount of energy expended has been almost limitless, and as the opening day drew near month by month, this amount of energy increased proportionately. The greatest amount of work was accomplished during the month of April, and especially during the last week or ten days, when from 15,000 to 17,000 men were employed, and work went on unceasingly. Exhibitors were given up to late Sunday night, the 30th day of April, in which to finish their work, or, if not finished, to have it reach as near as possible the point of completion. Meantime, while exhibitors were putting the finishing touches on their exhibits, from 4,000 to 5,000 men were cleaning up the grounds and buildings. These men worked through the night and up almost to the hour that the procession escorting the guests of the day entered the Exposition grounds, and they accomplished their work so that when the Exposition was formally opened to the world, it was ready for the inspection of visitors.

The ceremonies attending the opening began on Saturday, April 29, when the Duke of Veragua reached Chicago and was escorted to his hotel. An hour later President Cleveland with his cabinet and other government officials arrived and was escorted to the hotel by State and national troops, and a little later the Liberty bell, which received such ovations all along the route from Philadelphia, was escorted through the streets of Chicago to the Exposition grounds, received almost as great an ovation as was accorded the President and the descendant of Columbus. Thousands of strangers were in the city, and the streets were crowded from the station to the Exposition grounds, eight miles away. Public and private buildings were freely decorated, and, in spite of the gloomy weather, the ovation was a royal one.

Sunday, the 30th of April, was one of the most uncomfortable days that has been experienced in Chicago this spring. The atmosphere was chilly and a driving rain continued from early in the morning until after noon. Monday morning of the opening day, May 1, was somewhat brighter, and, although it was by no means pleasant, the sun made several brief appearances. The preceding week had been one of almost continuous heavy rains, and, as a consequence, the Exposition grounds and some of the streets were in bad condition. Many of the walks and promenades in the northern half of the Exposition grounds had had the finishing touches put upon them and had been rolled and swept until they were as hard and clean as an asphalt pavement. The highways of the southern end of the grounds—and it is here that the crowds largely center—had not been fully completed. Most of them had reached the point where only the top dressing and a little more rolling was required to complete them when the rains came and, lasting so many days, prevented the completion of the work.

The hour for opening the gates of the Exposition to the visitor is eight o'clock, but long before that hour on the opening day visitors poured in at all of the gates, and the stream increased in volume up to the time of the arrival of the procession. This procession consisted of a platoon of mounted park policemen, a detachment of city policemen, mounted, Company B Seventh United States Cavalry, the Chicago Hussars, mounted, Troop A Illinois National Guard, and a large number of carriages containing the officials of the Exposition, with the presidential and ducal parties, foreign representatives, city and State officials, ladies of the several parties, etc. This procession proceeded up Michigan Avenue, out the Boulevard, and entered the Exposition grounds by passing through Midway Plaisance. People crowded the streets along the entire route of the procession. In the Midway Plaisance the people in the several foreign villages turned out *en masse* to extend their welcome to the President. Turks, Moors, Egyptians, Singalese, Algerians, Japanese, Javanese, and the other foreigners extended their greetings to the President each in their own peculiar manner. Passing through the Plaisance into the Exposition grounds proper, the procession wended its way through throngs of people to the Administration building. Here the military companies formed an open passageway, through which the carriages passed as they drove up to the building, and the invited guests alighted.

The ceremonies attending the formal opening of the Exposition began promptly at half past eleven. The special platform constructed for the occasion on the east front of the Administration building provided sufficient seating capacity for the two thousand or more invited guests, the orchestra, the large chorus, and others. Exposition officials estimated that at least 150,000 people could be comfortably crowded into the Grand Plaza in front of the platform. Long before President Cleveland made his appearance on the stand all available space, not only in front but on each side of the Administration building and the great open areas in front of the Manufactures and Liberal Arts building and the Agricultural building, was crowded to the utmost, and thousands of people filled the grounds even as far east as in front of the Peristyle. The sight from the platform was magnificent. A large sounding board had been constructed directly back of the orchestra and chorus, and its efficiency was complete, thus adding much to the perfectness of the ceremonies.

After the President and other guests were seated, the ceremonies opened by the orchestra rendering the "Columbian March and Hymn." Dr. Milburn, chaplain of Congress, offered prayer, Miss Jessie Couthouli recited the "Prophecy," a poem written for the occasion by W. D. Croffut. Following the rendering of the overture, "Rienzi," by the orchestra, Director-General Davis of the Exposition delivered a short address, reviewing concisely the work and purpose of the Exposition. Concluding this address, the Director-General turned to President Cleveland, who returned the salute of the Director-General. As the President rose to his feet he was greeted by an outburst of cheering from the immense crowds in front of him, aggregating perhaps 300,000 people. Cheer after cheer arose, echoing from the Administration building across the basin to the Peristyle and back again. The President presented the purposes of the Exposition, asking for no allowance on the score of the youth of the nation, then declared the Exposition opened, and, touching the electric key, turned on the steam to the great 2,000 horse power engine of the power plant in the Palace of Mechanic Arts.

As President Cleveland touched the key and declared the Exposition opened, the sight and the sound following was most memorable. On every building throughout the grounds, and especially on those adjoining the basin and canals, the hundreds of flagstaves had been arranged with their flags tightly furled but ready to be flung to the breeze at an instant's notice. Immediately in front of the grand stand were three poles, each eighty feet high, and on top of each was a golden model of the Santa Maria. At the signal, flags were unfurled from these poles and the halliards controlling the flags on every one of the other flag poles were loosened as if by one movement, and the flags of every country exhibiting at the Exposition, the Exposition colors, and an immense amount of bunting of bright and harmonious colors were flung to the breeze. At the same instant two electric fountains situated on either side of the McMonnies fountain, and immediately in front of the grand stand, sent great streams of water fifty to seventy-five feet in the air, and the great golden Statue of the Republic mounted immediately in front of the Columbus entrance to the Peristyle was unveiled. The man-of-war Michigan which lay immediately off the Exposition pier fired twenty-one guns as a Presidential salute. The steam launches in the basin blew their whistles, and at the same time whistles from steamers lying at the pier and the great steam whistles and gongs on the power plant of the Exposition joined in the din. The orchestra and the chorus closed the formal exercises with the tune "America," and at the second verse the whole concourse of people, guests and visitors joined in the singing.

President Cleveland and the other invited guests retired to the Administration building, where a lunch was served. While they were preparing for the lunch a band of several American Indians that had been stoically watching the exercises was led into the rotunda under the vast dome of the building, and at a given signal they sounded the Indian war whoop which startled the foreign guests. After a short rest following the lunch, the President, the Duke and a few more of the more prominent guests were escorted about the grounds and through the several buildings, riding part of the way in carriages and the rest of the way in electric launches on the waterways. Quite a little reception was held in the Manufactures and Liberal Arts building, where the President and the official representatives of all the exhibiting nations and colonies who were present were formally introduced. President Cleveland and party left the grounds at half past five for Washington.

It is hardly to be expected that such an enormous undertaking as this Exposition has been could be wholly complete in every respect on the opening day. Nevertheless visitors have no reason to be disappointed or critical, for on the opening day there were more exhibits to be seen and studied than any human being

(Continued on page 294.)