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THE CROWNING ACHIEVEMENTS OF THE TELEPHONE.

Two exhibitions of recent achievement in the line of telephony have recently taken place in this city. The first one signalized the opening of the telephone line from New York to Chicago. The next one was a public exhibition of the capacity of that line given by the transmission of music over the thousand miles intervening between here and the City of the Lakes. The music was so perfectly reproduced as to be heard by members of a large audience. To day New York is in telephonic communication with Chicago, and the oral transmission of intelligence has become an everyday affair. When the telephone was first introduced, it was believed that it would never have a very extensive application. It seemed impossible that all the leading business offices in such a city as New York should be put in communication with each other in any practical way by the almost impracticable invention of seven-teen years ago. After the development of the telephone with microphonic transmitters for short distance work had become an acknowledged fact, the troubles offered by induction and the static capacity of long lines caused many to believe that the telephone could never be a long range instrument. As in the case of many other things in this world, it was found that the best appliances secured the desired results. The construction of an absolutely first-class copper line of large caliber wire and of the most perfect details of mounting has removed the thousand miles intervening between here and Chicago effectually, and now conversation can be held with Chicago even better than ordinarily with New York City connections. The success of long distance telephoning in the present case is merely one of the additional triumphs of the best.

On February 7 of the present year, a still greater achievement was commemorated. On that day was witnessed the opening of the telephone line from Boston to Chicago. Telephoning is successfully carried on over 1,250 miles of wire, owing to a somewhat circuitous route followed by the line. All distances hitherto covered are insignificant compared to this. The possibilities it holds for the future cannot well be overestimated. A step beyond Chicago and the banks of the Missouri will be reached, and we may yet see Omaha and San Francisco connected by a line which will form the final link in a chain bringing San Francisco and New York within speaking range of each other. When conversation is carried on perfectly as it now is over 1,250 miles of wire, the extension of distance becomes a matter of detail.

A few days after this reaches our readers, the original Bell telephone patent, to which the courts have awarded an unprecedentedly wide scope, will have expired. The expiration of the patent and opening of the field of telephony to the nation is, under the circumstances, a signal epoch in the history of invention. Seventeen years ago the patent was granted. Under energetic business management the industry based on this patent attained an enormous development, and it is interesting to note that these monumental achievements have only been accomplished during the last days of the life of the patent. The invention has not lived out a short life of usefulness to be relegated to obscurity. It has increased continually in importance and it is only at the end of its monopoly that its greatest developments have taken place. The connection of the two metropolises is a fitting work for the year of the Columbian Exposition. The American invention of the telephone will have in these commercial lines erected for everyday use its most impressive exposition—an exhibit which will far surpass anything that can be shown in the great halls of the electrical building of Chicago. It is an exhibit requiring the area of six or more States for its display.

The value of this invention in a money-making sense has been enormous. The price paid by the inventor of the telephone for his protection, technically speaking, becomes payable in a few days. The price paid for a patent is its surrender in statutory time to the public. The patent fee is merely designed to cover the expense of the office, and is no part of the consideration given by the inventor. But if we take an enlightened view of the matter, we will see that during its existence the Bell patent, by the convenience it has afforded the public in the transaction of business, has awarded the public a rich return for the monopoly granted. The convenience alone is invaluable, and the money return to business men in the transaction of important matters cannot be overestimated.

The completion of these great long distance lines marks the beginning of an epoch when telephony will acquire a new importance. Were the patent awarded a further existence, every year would witness for it an increase in value. The returns received for the patent hitherto have been in great part based upon what it did during its struggling years of business, and during a period of great uncertainty when it was quite problematical what its results were to be. Now that it has obtained a firm lease of life, now that the telephone itself is in the full strength of a matured existence, the patent lapses. It is the old story; the inventor obtains the least reward for his exertions; the true beneficiary is the public. Estimating the benefit which the pub-

lic has received from the invention, had the return been one hundred fold to the owners of the invention, the reward even then for what has altered the whole face of business and commercial life would have been not a particle too much. The spirit of our patent system is admirably illustrated in the whole matter. An invention is made; the incitement for making the invention is the award by government of a short monopoly conditional on its being patented; that is, disclosed to the public. Thus incited, the inventor works to achieve his result, achieves it, and obtains what return he can in the seventeen years of its life. Then, in the full vigor of an assured success, with the most brilliant prospects before it, after having revolutionized the business world, the invention becomes public property and the inventor loses all claim upon it.

The moral in the history of the telephone applies well in the case of the would-be minimizers of patent rights. For just as the invention is in its most advanced state of development and has the most brilliant future before it, when the returns from it should be of unprecedented and of growing largeness, it becomes public property and part of the capital of the American nation at large.

THE ANNUAL REPORT OF THE COMMISSIONER OF PATENTS.

The annual report of Commissioner Simonds, dated January 31, has been issued. It is contained in the Patent Office Gazette of February 7. The general report deals with the old questions which unfortunately are very live questions—questions which we have repeatedly dilated on in these columns. Want of room, want of facilities and want of help are the crying needs of the office. The delay in disposing of patent cases is very great, but no relief is granted by Congress.

From the report we learn that there are now 605 officials and employes, with salaries varying from \$5,000 to \$360 per annum. The three superior officers are appointed by the President, 464 are under civil service rules, the remainder in the unclassified service are appointed.

For the World's Fair an exhibit including some 2,500 models, nearly all working models, is in preparation. It will include many loans from inventors in addition to original models in possession of the office, and will form an exhibition of interest quite unique. One of the models goes as far back as 150 B. C.; another illustrates a harvester used in the first century of our era.

The net receipts of the office were \$1,236,331.33. The expenditures were \$1,110,739.24. The balance in the United States Treasury to the credit of the office reached on January 1, 1893, the sum of \$4,179,910.26. During the year 1892, 39,514 applications for patents for inventions were received, 104 for reissues and 1,130 for design patents; 23,478 patents were issued and 81 reissues were granted; 13,291 patents expired during the year. Among the grantees of patents next to America comes England with 653 United States patents granted. Germany presses close to her with 507 patents. New York heads the list of States and Territories with 3,781 patents; Oklahoma is at the foot with 3. Connecticut is the most inventive State, with one patent to every 955 inhabitants; Mississippi is the least, with one patent to every 23,447 inhabitants.

The report is of unusual interest throughout, and in our brief summary we have left much of it untouched.

PROGRESS OF LONG DISTANCE TELEPHONY.

"The Telephone and How We Talk from New York to Chicago" was the title of an interesting experimental lecture given before the New York Electrical Society, at Columbia College, New York, on the 8th inst. Mr. J. J. Carty, the electrician of the Metropolitan Telegraph and Telephone Company, explained the nature of sound and the mechanism of speech, its propagation and reception by the ear, the physiology of the ear, the evolution from the speaking tube and string telephone to the electric, telephone, a description of the construction and principle of the latter, and the construction of the transmitter, induction coil and the battery. By means of an electric arc lantern, diagram lantern slides were projected on the screen, illustrating very fully the points Mr. Carty made.

Following him, Mr. F. A. Pickernell, the accomplished chief engineer of the American Telegraph and Telephone Company (the Long Distance Company), gave an entertaining account of the growth and extent of long distance telephony. As telephone lines began to be extended, it was found a wire weighing sixty-five pounds to the mile would answer. But with the introduction of metallic circuits, which gave results free from the induction, experience demonstrated heavier wires with less resistance were the most satisfactory. In learning these things they had found it necessary to lay aside the empirical rules certain noted electricians had made and establish a standard of their own, as it appeared to be a special science, requiring special conditions. The early experiments were tried