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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 372,

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VIENNA INTERNATIONAL ELECTRIC EXHIBITION.

In the ten years since the Universal Exposition of 1873 was held in Vienna, the larger part of the modern advance in the utilization of electricity has taken place. Electrical science has entered upon a new phase, and from a very subordinate position among the great factors of the world's progress it has risen to a place very near the front.

Vienna, too, has undergone many and material changes. Though outstripped by Berlin, the city has grown rapidly, and has added much to its attractiveness to tourists by the erection of a large number of monumental public buildings and otherwise. The city has been surprisingly prompt in the adoption of electrical improvements and novelties in the way of telephones, electric lights, and the rest, and by its commanding position enjoys superior advantages as the commercial entrance to a large and populous portion of south-eastern Europe.

Accordingly, to American engineers, inventors, owners of electrical patents, and manufacturers of electrical appliances and machinery, the International Electrical Exhibition in Vienna, to be held next fall, offers a very favorable opportunity for observation and study, and for presenting new electrical inventions and manufactures to a considerable portion of the civilized world.

A communication from Mr. Carl Pfaff, of the Managing Committee, dated Feb. 4, announces that the exhibition will continue from August 1 to October 31. No prizes or medals are to be awarded.

Among the more recent indications of electrical progress in that part of the world, our correspondent, Alfred Pollak de Rudin, in Vienna, mentions the lighting of the streets of Temesvar, in Hungary, by means of Edison lamps, to be completed next summer; the lighting of the Emperor's palace in Vienna by electricity; the introduction of telephones in the great general hospital of the same city, to enable patients in the infected wards to converse with their friends without risk of infection; the use of incandescent electric lamps in three of the large silk establishments of the city, the current being supplied by means of accumulators; and the lighting of the National Theater, in Prague, by means of Edison lamps.

THE PROBLEM OF THE TELEPHONE.

That the American Bell Telephone Company is master of the telephone field must be acknowledged. Every telephone user knows it. Every would-be user knows it. Every telephone inventor knows it. The recent consolidation of telephone interests, the massing of capital, the successes in court, have made this company a tower of strength. With a capital of $10,000,000, swelled by premium to $18,000,000, with legal advisers, and experts schooled in the art of telephony from the beginning, and with judicial prejudice in its favor, it appears futile for a rival to attempt a contest with so powerful an opponent. If the claims of the Bell patent are to be construed by every court as covering any and all methods of transmitting speech electrically, then telephone inventors must be content with the bare possibility of disposing of their inventions to the controlling power; but if, on the other hand, the Bell patents are found to cover only a specific method and apparatus for transmitting speech, then there is a field in which inventors may work with prospects of a reward.

Hitherto, nothing has transpired in court by which the true status of the Bell patent has been defined, for in no instance has the court passed upon the merits of the questions at issue. The decrees have been obtained by default, or by consent, or in consequence of admissions of the defendants, which rendered it unnecessary for the court to decide upon the merits of the case.

It is held by some that the Bell patent covers only the method of and apparatus for transmitting speech electrically by means of undulatory currents of electricity. It is held by the Bell counsel and experts that there can be no other method, while it is claimed by others that another method and other apparatus may be employed to accomplish the same end. In all these phases of the telephone problem there arise questions for which there is now no answer. The most intricate points of law as well as the most subtile physical principles are involved; and now the question is, as to the advisability of pursuing telephone investigations for purely monetary considerations. Any one familiar with the present status of telephonic apparatus can readily see that there is no greater field for study, and none that has greater promise of profit in it, than that of telephone invention.

Let the legal aspect of the matter be as it may, it is positive that the accomplishment of certain improvements in the telephone would yield a far richer harvest than has been reaped by any inventor in this line. It should be no source of discouragement to the determined and intelligent inventor that hundreds, and probably thousands, have reached toward the prize with a grasp too short, for it is only a faithful index of the great value of the prize that so many have striven for it.

The results to be attained are continuity, uniformity, and reliability of action, increased volume of sound, freedom from external disturbances, increased distances, and better service for less money. How all this is to be accomplished we shall not attempt to suggest, but a few of the obvious things to be done are to reduce the delicacy of the apparatus, to increase the current used on the line wire and to use a current of lower potential, and to isolate the telephone wires from other line wires carrying heavy currents.

Why should not the telephone speak out in the ordinary conversational tone, and why should it not be spoken to in the same tone, without the necessity of being near the instrument? Why should not the distance over which conversation is carried on equal telegraph distances? Of course, we know that electricians and physicists have struggled with these problems, but what are the results?

If we are to have a long distance telephone, the induction coil must be discarded, because the secondary current avails itself of every avenue of escape from its conductor, and everything with which it comes into contact—the insulators, the air, even contiguous wires—rob it of some of its strength, so that in attempting to communicate by telephone over long lines the current is lost, little by little, at every insulator, and all along the line until it is finally insufficient to affect the receiver.

If a battery current of the strength used in telegraphy be employed, evidently something besides carbon must be used for electrodes in the transmitter, or the instrument under some conditions might yield an electric light instead of transmitting speech.

Some are of the opinion that speech can be transmitted by means of an interrupted current on a broken circuit. If this is possible, a proper apportionment of the periods of contact and periods of separation of the electrodes of the transmitter should give increased volume of sound, and permit of the use of a battery current on the line.

The fact that more than five hundred patents have been issued for telephonic improvements will naturally discourage inventors, but let the student of telephony consider that there is a great similarity between many of the telephone inventions; that the variations are mostly structural, and not in principle; that the majority of inventors are wedded to certain accepted theories; and finally, that most if not all of them are in the same groove, and that to obtain new results there must be a radical departure from the reigning idea; then he will look for means and methods differing from those of his predecessors.

In what the telephone of the future will consist we cannot predict; but it should be capable of talking and being talked to, as one person talks to another; and a man in New York should be able to transact business orally with another in Chicago or San Francisco.

A FOUR-MILE DEPOSIT OF IRON ORE.

Public attention has just been brought to a deposit of carbonate of iron—siderite—extending a distance of four miles along the Hudson River, in Columbia County, and having a depth of eighteen feet. The control of this enormous body of potential wealth has recently been acquired by a combination of prominent iron and steel manufacturers, who after careful investigation are convinced that the new deposit contains a volume of ore equal to that of the famous Cleveland mine in the north of England, which now yields something like 6,000,000 tons of ore a year. The ore is similar in character, but superior in quality to the Cleveland ore. It is also closely similar to that of the great Luxembourg deposit in Belgium.

The geological and chemical features of the Columbia County deposit have been carefully studied by Prof. John C. Smock and Mr. Walter L. Lawrence, who, it is said, have demonstrated its volume and quality to be as above stated. They find that the ore contains 48 per cent of iron, 9¼ per cent of silica, one-half of one per cent of sulphur, and one-fortieth of one per cent of phosphorus.

The deposit is so situated that from every point the ore can be run to the water's edge by gravity, passing over the track of the Hudson River Railroad. The title to the whole tract is now vested in the Hudson River Ore and Iron Company, and it is promised that the active development of the property will begin early in the spring. Already the necessary machinery has been prepared for early shipment, and the construction of wharves, tramways, workmen's dwellings, etc., will begin as soon as the weather will permit.

The men who have invested so largely in this enterprise are among our wealthiest and most capable producers of iron and steel, and are not likely to be mistaken with respect to the value of the deposit they propose to develop. Accordingly, there is good reason to anticipate early changes in the iron and steel trade, which will make the United States entirely independent of foreign ores, and New York pre-eminently the iron State of the Union.

Curious Effects of Lightning.

Some interesting effects of lightning have been observed by M. Alluard at the summit of the Puy de Dome, where, on a circular tower, is an iron mast about twenty feet high, supporting an anemometer of the Robinson type, with four copper cups. There is also a ladder and stand (both made largely of iron), to allow of access to the anemometer, for cleaning. Two metallic cables connect the system with copper plates in the ground. Under these conditions, St. Elmo's fire often appears at the salient points of the mast, stand, etc., and a slight hissing is sometimes heard. All the cups of the anemometer show numerous signs of fusion by lightning, and only in their upper half; their connecting iron circle has also been fused in some places. Wherever such fusion has occurred, the metal has been raised like a small volcanic cone in the center of a crater. Some exterior attractive force seems to have raised the melted substance. M. Alluard proposes to study the phenomenon more closely.