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Science of Ocean Telegraphing.

Some of our cotemporaries have been indulging in somewhat curious speculations in regard to ocean telegraphing. After the cable was laid, on the 5th of August, it was stated that it would be in working order and open to the public in about two weeks. More than a month has since elapsed, and this promise remains unfulfilled. A few electric messages have passed across the Atlantic, but at long and painful intervals. On the 28th ult., news was received that the *Asia* was to sail from Liverpool on that day; the next news received from Europe was by the steamship herself, which arrived at Halifax on the 8th inst., thus beating the Ocean Telegraph eleven days.

The *New York Herald* attributes all the blame to the defective instruments of Professor Whitehouse, which it says are a combination of the Morse and Bain systems, (an impossibility, the one being chemical and the other mechanical,) and firmly asserts that Mr. Hughes' instruments would work the line with great rapidity. The New York *Evening Post*, of the 6th inst., assumes that the difficulty with the Ocean Telegraph is not due to the instruments, but to the cable itself. This is not a new idea, although it is put forth as such, and upon the most unscientific data.

It says: "We propose to consider the fundamental grounds of the difficulty, and apply them to the general question of ocean telegraphy. The velocity is not determined by the force and intensity of the electric current, nor by the thickness of the wire—these conditions only modify the law which determines the velocity of propagation. Professor Wheatstone sent a current through a brass wire the twelfth of an inch in diameter with a velocity of 286,000 miles per second. Mr. Walker, one of our own electricians, sent a current with the velocity of 18,000 miles per second. Messrs. Fizeau and Gounelle sent a current along an iron wire one-fifth of an inch in diameter 62,700 miles per second, while along a copper wire of double this diameter, they sent a current 110,000 miles per second. So that conductors made of different substances, and of different sizes of wire, do not give velocities proportional to their conducting powers. Hence it follows, that the difficulty of transmission with ocean cables will be one of velocity and not of power. This we might have anticipated from the discussion of first principles; and the Atlantic cable has verified the theoretic inference."

To derive such an inference and arrive at such a conclusion, extracts from "Gulliver's Travels" would be as useful as the above, relating to the experiments with electric conductors. The reasoning of the *Post* amounts to this in plain language:—An electric current moves with as great a velocity in a copper as in an iron wire; therefore, as the conducting wire of the ocean cable is of copper, the difficulty of transmission is one of velocity. A droll conclusion from such a premise. The experiments related prove that currents flow more rapidly in large than in small conductors, and the law of resistance in this respect is well known. But these experiments only determined the velocity of *currents per second*, not according to the length of the line, which is quite a different question, and the one under consideration.

It is well known that a resistance is offered to the electric currents in all conductors, and this resistance is in proportion to the length and thickness of the conducting wire. The longer the wire the greater the resistance; the thicker the wire the less the resistance. One mile of copper wire one-tenth of an inch thick offers as much resistance as one four miles long the fifth of an inch thick. The *Post* is correct in one particular. It says that hot and cold currents in the ocean will affect the time of the passage of the electric current in the cable. Sir Humphrey Davy made this discovery, and it accords with the working of our telegraph lines on land. In very cold weather the current flows freely, while in warm weather telegraphing is greatly impeded. If the Ocean Cable passes through a portion of the warm Gulf Stream, its conducting power must be greatly impaired.

To provide a remedy for this difficulty, the *Post* proposes that a cable should be constructed with permanent magnets attached at intervals along it whole length. This would increase rather than remove the difficulty. The Ocean Cable partakes too much of the character of a permanent magnet now. It is a sort of Leyden jar, charged with electricity, and thus it presents a counter force to the rapid transmission of signals. The resistance to the current in the Ocean Cable in proportion to the length of the wire, is inversely as its diameter, and the relative difference between the conducting power of the wire and the insulating coating of gutta percha. Thus the seven copper wires in the interior of the cable are one-twelfth of an inch in diameter, and the coating of gutta percha is two-twelfths of an inch, or four times the capacity. Allowing the gutta percha to be fifty million times inferior in conducting power to the copper, the current in a cable 3,157 miles would be restored to equilibrium. As the Atlantic Cable therefore is 2,022 miles long, about two-thirds of the amount of the force of the current must be absorbed in passing through it. When it is also taken into consideration that primary currents produce inductive currents in the cable, the difficulty of ocean telegraphing will be rendered obvious by the use of any instrument whatever. Had the cable been larger, it would have formed a better conductor, but that a current can be sent through it at all, affords some grounds of hope for future improvements in Ocean Telegraphs. This ocean line, we trust, is only the pioneer of others.

The *Tribune* of the 9th inst. contains a letter from Mr. Field in reference to the silence of the Ocean Telegraph. He attributes the difficulties to the use of the instruments of Professors Whitehouse and Thompson, but states that these will soon be removed, and those of Professor Hughes will be substituted. In reference to this telegraph, he says, "there is no reasonable doubt that Professor Hughes will be able to transmit intelligence through the cable reliably at the rate of about three hundred words per minute."

Mr. Field, we think, is inconsiderate in his statements. In endeavors to send simple currents through the Ocean Cable, these have sometimes ceased to flow for a considerable period of time, without any apparent cause; then they would flow again, in the same inexplicable manner. As Hughes' instrument does not generate, but is operated by these currents, it cannot remedy this difficulty, as it is one which belongs to the cable, not to the operating instruments. The Hughes' telegraph also requires a strong current, whereas, the currents sent through the cable have been very feeble. The correct operations of this telegraph depend on the simultaneous revolution of a type wheel in Ireland and another in Newfoundland. If one revolves an instant faster then the other, a wrong message is sure to be sent. In such a long line, this must frequently occur, and thus by the instruments getting out of register, they will often be rendered incapable of satisfactory operation.

CRISIS OF THE FRENCH IRON TRADE.—According to the French papers "the very existence of the iron trade in France is at stake." Several large establishments have closed, many others have slackened work, and discharged numbers of workmen, having on their hands the products of the last six months.

The Sewing Machine Controversy.—Important Case.

Several suits in equity are now pending in this and adjoining States, in which the Wheeler & Wilson and Grover & Baker sewing machine companies are the complainants. Their purpose is to enjoin the manufacture and sale of certain sewing machines invented by other parties, and which, the complainants allege, violate their patent in the apparatus for feeding the cloth. One of these suits, in which the Atwater ($25) Sewing Machine Company is the principal defendant, was set down for argument, on a motion for a preliminary injunction, on August 25th, before Judge Ingersoll, United States District Judge, sitting in circuit at New Haven, Conn.

A large number of parties, inventors and others interested in sewing machine patents, were present in court. The complainants were represented by ex-Senator Baldwin, of Connecticut, George Gifford, of New York, and the Messrs. R. and C. J. Ingersoll, of Connecticut. James T. Brady and Edward N. Dickerson, of New York, with whom was associated George G. Sickles, of New York, appeared for the defendants.

In these cases the complainants filed bills for injunctions, and on the 25th ult. the motions to restrain the further manufacture of the Atwater and Herron sewing machines, came on to be heard at New Haven. After reading the papers, and before the opening of the case on the part of the complainants, it was suggested to the Court by the counsel for defendants that upon the face of the bill there appeared a fatal defect in the title of the complainants, and that it would be a waste of time to enter upon any extended discussion of the questions of infringement or of invention until that was settled.

The bills disclose the fact that the present owners of a *portion* of the patent granted to A. B. Wilson, November 12, 1850, have, from time to time, conveyed their interests to the patentee, for the purpose of procuring reissues at the Patent Office, and that after each re-issue the new patent had been re-conveyed to them, but that they had not procured the consent or co-operation of the owner of the remaining portion, whose title to the original patent is still existing and valid.

Messrs. Baldwin, Ingersoll, and Gifford, for the complainants, contended that an owner of any portion of a patent might surrender and re-issue it at pleasure, leaving his joint owner the privilege of selecting between the original and re-issued patents, and of retaining the original, so far as his interests were concerned, in full force against the public, if he thought it better than the re-issued patent.

Messrs. Brady and Dickerson contended that but one good patent could exist at a time for one invention; and that as the original patent in this case had never been surrendered by all the owners, it must be true that any other patent for the invention covered by that original existing patent must be void.

Thereupon the counsel for the complainants asked for a week to prepare themselves more fully to argue this interesting point; and the Court, after making some suggestions somewhat favorable to the views of the defendants, but without expressing any decisive opinion upon the question, adjourned the further hearing till the third Tuesday in September, in order to give the complainants the opportunity they desired for more mature reflection.

Death of Edward Pease.

This amiable and talented gentleman died a few weeks since, aged ninety, at his residence in Darlington, England. He was a member of the Society of Friends, and had lived a calm and peaceful life, ever doing good and encouraging humble and rising genius. He it is to whom Great Britain, in a great degree, owes her railway system, for when George Stephenson was a humble colliery engineer, Mr. Pease believed in his ideas, and advanced the capital and used his vast commercial influence to construct the first railway on which a locomotive ever traveled. To his dying day, George Stephenson remembered him with gratitude and affection, and Mr. Pease was always pleased to exhibit a handsome gold watch, received as a gift from his celebrated protégé, bearing the words:—"Esteem and Gratitude, from George Stephenson to Edward Pease."

Among the Statues.

Powers' colossal statue of Daniel Webster recently lost on the voyage to Boston, is now in course of reproduction from the original model. The process will require about twelve months.

Mr. Hart's marble memorial of Henry Clay, for the ladies of Virginia, is in progress, and will be completed this year. The same artist is occupied on a model for a colossal bronze figure of Clay for the city of New Orleans.

Mr. Jefferson is also being commemorated in marble, for the State of Virginia, by a young sculptor—Mr. Galt.

Harvard University has secured another of Powers' busts—that of Jared Sparks, the late President. "California," his latest effort in art, is completed, and will be immediately shipped to New York, for Wm. B. Astor.

New Appointments at the Patent Office.

R. R. Rhodes, of La., to be Chief-Examiner of Class I. (*Harvesters*).

A. M. Smith, of N. Y., and John Shugert, of Pa., to be Assistant-examiners of the above class.

Henry Wurtz, of N. Y., to be Assistant-examiner of Class IV. (*Chemical Processes*).

H. N. Taft, of N. Y., to be Assistant-examiner of Class IX. (*Civil Engineering*).

Robert D. Clark, of Mich., to be Assistant-examiner of Class X. (*Land Conveyance*).

Joseph Fales, of Iowa, to be Assistant-examiner of Class XVII. (*Household Furniture*).

Edward Holmead, of Md., to be Assistant-examiner of Class XVIII. (*Firearms*).

All the above appointees are able and accomplished gentlemen. Mr. Rhodes, the new chief of the Harvesters, is very highly spoken of. Mr. Wurtz enjoys an excellent reputation as a practical chemist.

We believe it is now generally admitted that the Patent Office has suffered nothing, but rather gained, by the removal of sundry of the elder examiners, who were chiefly distinguished for their dogged adherence to old-fashioned views. Under the generous and liberal interpretation of the Patent Law introduced and insisted upon by the present Commissioner, Mr. Holt, the Office is working with admirable harmony and efficiency.

Something for our Friends.

If at any time we should reasonably entertain fears for the immediate prosperity of the SCIENTIFIC AMERICAN, they would probably have taken hold of us at this particular period. We know that there is now nothing like a "panic," such as we encountered at this time last year, just as we were beginning a new volume; but there is that which is sometimes worse than a panic—a deadness in the arteries of the mechanical trades of our country—the result of a commercial depression. Yet in spite of these adverse influences the SCIENTIFIC AMERICAN has a host of true friends who are now actively canvassing for it; and at no former period in its history have subscriptions come in more encouragingly than at present. Our friends are doing nobly, and we heartily thank them. Their good words and their fine lists of names cheer us, and we hope they will continue to persevere in their well-doing until they have increased the subscription-list of their favorite paper to at least five thousand above what it had at the close of the last volume. The editorial force employed upon the SCIENTIFIC AMERICAN was never so strong as now; and altogether we can confidently promise our readers that the present volume will afford a rich and rare treat of useful and entertaining matter.