THE ELECTRO-MAGNETIC TELEGRAPH.

The two following extracts, from well known scientific journals, give a very concise history of the development of the electro magnetic telegraph, and require no note or comment:

Extract from the *Edinburgh Philosophical Journal* for 1825, Vol. XII, page 105: On the laws of electro-magnetic action as depending on the length and dimensions of the conducting wire. By Peter Barlow, F. R, S. (Published January 1, 1825.)

"In a very early stage of electro-magnetic experiments, it had been suggested that an instantaneous telegraph might be established by means of conducting wires and compasses. The details of this contrivance are so obvious, and the principles on which it is founded so well understood, that there was only one question which could render the result doubtful, and this was: Is there any diminution of effect by lengthening the conducting wire?

It had been said that the electric fluid, from a common electrical battery, had been transmitted through a wire four miles in length, without any sensible diminution of effect, and, to every appearance, instantaneously; and if this should be found to be the case with the galvanic circuit, then no question could be entertained of the practicability and utility of the suggestion above adverted to. I was, therefore, induced to make the trial, but I found such a considerable diminution with only 200 feet of wire as at once to convince me of the impracticability of the scheme."

Extract from Silliman's *American Journal of Science and Arts*, for 1831, Vol. XIX. pages 400—404: On the application of the principle of the galvanic multiplier to electro-magnetic apparatus, and also to the development of great magnetic power in soft iron, with a small galvanic element. By Professor Joseph Henry.

* * * * "The idea afterwards occurred to me that a sufficient quantity of galvanism was furnished, by the two small plates, to develop, by means of the coil, a much greater magnetic power in a larger piece of iron. * * * At the same time, a very material improvement in the formation of the coil suggested itself to me on reading a more detailed account of Professor Schweiger's galvanometer, and which was also tested with complete success upon the same horse shoe; it consisted in using several strands of wire, each covered with silk, instead of one. * * * With a pair of plates four inches by six, it lifted thirty-nine pounds, or more than fifty times its own weight.

These experiments conclusively proved that a great development of magnetism could be effected by a very small galvanic element, and also that the power of the coil was materially increased by multiplying the number of wires, without increasing the length of each.

The multiplication of the wires increases the power in two ways: first, by conducting a greater quantity of galvanism, and secondly, by giving it a more proper direction, for since the action of a galvanic current is directly at right angles to the axis of a magnetic needle, by using several shorter wires we can wind one on each inch of the length of the bar to be magnetized, so that the magnetism of each inch will be developed by a separate wire; in this way the action of each particular coil becomes very nearly at right angles to the axis of the bar, and consequently, the effect is the greatest possible. * * *

In order to determine to what extent the coil could be applied in developing magnetism in soft iron, and also to ascertain, if possible, the most proper length of the wires to be used, a series of experiments was instituted jointly by Dr. Philip Ten Eyck and myself. For this purpose, 1,060 feet (a little more than one fifth of a mile) of copper wire of the kind called bell-wire, ·045 ($\frac{45}{1000}$) of an inch in diameter, were stretched several times across the large room of the Academy. * * * *

In one experiment, the whole length of wire was attached to a small trough on Mr. Cruickshank's plan, containing twenty-five double plates, and presenting exactly the same extent of zinc surface to the action of the acid as the battery used in the last experiment. The weight lifted in this case was eight ounces; when the intervening wire was removed and the trough attached directly to the ends of the wires surrounding the horse shoe, it lifted only seven ounces. From this experiment, it appears that the current from a galvanic trough is capable of producing greater magnetic effect on soft iron, after traversing more than one fifth of a mile of intervening wire, than when it passes only through the wire surrounding the magnet. It is possible that the different states of the trough, with respect to dryness, may have exerted some influence on this remarkable result; but that the effect of a current from a trough, if not increased, is but slightly diminished in passing through a long wire is certain.

On a little consideration, however, the above result does not appear as extraordinary as at the first sight, since a current from a trough possesses more projectile force, to use Professor Hare's expression, and approximates somewhat in intensity to the electricity from the common machine. May it not also be a fact that the galvanic fluid, in order to produce the greatest magnetic effect, should move with a small velocity, and that, in passing through one fifth of a mile, its velocity is so retarded as to produce a greater magnetic action?

But be this as it may, the fact, that the magnetic action of a current from a trough is, at least, not sensibly diminished by passing through a long wire, is directly applicable to Mr. Barlow's project of forming an electro-magnetic telegraph, and also of material consequence in the construction of the galvanic coil."

Photo-engraving on Metals.

William A. McGill and Robert G. Pine, of Memphis, Tenn., have invented a new process for photographic engraving on metals and other substances, which they describe as follows:

"We take, as a base of operation, a pure silver surface or an alloy; and, after finely polishing or frosting it, it is subjected to the action of iodine, and a film of the iodide of silver is formed on the plate. We then expose the plate to the action of light in the *camera obscura*, or under a photographic negative, until a faint image of the object is formed. The plate is then submitted to the action of an electrotype battery (copper solution), when a well defined image of the object in copper is formed, the cupreous deposit attaching itself only to those parts of the plate which were rendered conductors of electricity by the action of light, while the unexposed parts will remain non-conductors of electricity. The plate is now dried and etching solution poured on it, composed of sulphuric acid saturated with nitrate of potash, or their equivalents. This solution immediately attacks the shadows or exposed portions of silver surface, while the cupreous deposit from the electrotype bath is not affected. After etching the required depth, the copper deposit on the plate may be readily removed by *aqua regia*, which will not act on the silver plate, leaving a finely etched image in the silver plate.

To engrave or etch on steel, gold, copper, and other substances, the surfaces are first coated with pure silver. We then proceed substantially as above explained, with the exception that different acids or combinations of acids are used on the various metals or other substances after the silver plating or surface is etched through, according to the nature of the base to be operated upon; for instance, in etching on gold, after the silver is etched through with the saturated solution of sulphuric acid and nitrate of potash, we use *aqua regia* or nitro-muriatic acid, which acts on the gold, but leaves the silver intact.

The invention is specially applicable to the ornamentation of silver plate and jewelry."

Recurrent Vision.

In the course of some experiments with a new double plate Holtz machine, belonging to the college, I have come upon a very curious phenomenon, which I do not remember ever to have seen noticed. The machine gives easily intense Leyden jar sparks, from seven to nine inches in length and of most dazzling brilliance. When, in a darkened room, the eye is screened from the direct light of the spark, the illumination produced is sufficient to render everything in the apartment perfectly visible; and what is remarkable, every conspicuous object is seen twice at least, with an interval of a trifle less than one quarter of a second—the first time vividly, the second time faintly; often it is seen a third and sometimes, but only with great difficulty, even a fourth time. The appearance is precisely as if the object had been suddenly illuminated by a light at first bright, but rapidly fading to extinction, and as if, while the illumination lasted, the observer were winking as fast as possible.

I see it best by setting up, in front of the machine at a distance of eight or ten feet, a white screen having upon it a black cross, with arms about three feet long and one foot wide, made of strips of cambric. That the phenomenon is really subjective, and not due to a succession of sparks, is easily shown by swinging the screen from side to side. The black cross, at all the periods of visibility, occupies the same place, and is apparently stationary. The same is true of a stroboscopic disk in rapid revolution; it is seen several times by each spark, but each time in the same position. There is no apparent multiplication of a moving object of any sort.

The interval between the successive instants of visibility was measured roughly as follows: A tuning fork, making 92½ vibrations per second, was adjusted so as to record its motion upon the smoked surface of a revolving cylinder, and an electromagnet was so arranged as to record any motion of its armature upon the trace of the fork; a key connected with this magnet was in the hands of the observer. An assistant turned the machine slowly, so as to produce a spark once in two or three seconds, while the observer manipulated the key.

In my own case, the mean of a dozen experiments gave 0″·22 as the interval between the first and second seeing of the cross upon the screen, separates results varying from 0″·17 to 0″·39. Another observer found 0″·24 as the result of a similar series.

Whatever the true explanation may turn out to be, the phenomenon at least suggests the idea of a reflection of the the nervous impulse at the nerve extremities, as if the intense impression upon the retina, after being the first time propagated to the brain, was there reflected, returned to the retina, and from the retina, traveling again to the brain, renewed the sensation. I have ventured to call the phenomenon "recurrent vision."—*Professor C. A. Young, in the American Journal of Science.*

Poisoned Collars.

Some of the brands of paper collars are glazed with a mixture containing white lead, which is a dangerous poison when brought into contact with the skin. An exchange mentions the case of a clergyman who became troubled with numbness of the limbs, which, with other symptoms, led his physician to suspect poison. On combustion of the paper collars worn by the clergyman—the "Dickens" brand—the ash was found to contain white lead.

THE tunnel under the city of Genoa, connecting the other railways with that going to Nice, is to be opened during the present month.

IMPORTANT TRADE MARK DECISION.

Before the Supreme Court of the United States.

The President, Managers, and Company of the Delaware and Hudson Canal Company, appellants, *versus* Henry C. Clark. Appeal from the Circuit Court of the United States for the Southern District of New York.

The complainants commenced mining on their lands in Lackawanna valley about the year 1828, and they have ever since been engaged in taking out coal and carrying it to the Hudson river and to the markets of the country. The averment of their bill is that about the time they commenced their operations they sought out, devised, and adopted the name "Lackawanna coal" as a special, particular, and distinctive name or trade mark by which their coal might be introduced to dealers as the product of their mines in distinction from the coal of other producers, and that prior to their adoption of the word "Lackawanna" it had never been adopted or used in combination with the word "coal" as a name or trade mark for any kind of coal. Their bill also avers that ever since their adoption of the name their coal has been called and known in the market as "Lackawanna coal" and by no other name. These averments of the bill are supported by no inconsiderable evidence. The complainants were undoubtedly, if not the first, among the first producers of coal from the Lackawanna valley, and the coal sent to market by them has been generally known and designated as Lackawanna coal. Whether the name "Lackawanna coal" was devised or adopted by them as a trade mark before it came into common use is not so clearly established. On the contrary, the evidence shows that long before the complainants commenced their operations, and long before they had any existence as a corporation, the region of country in which their mines were situated was called "the Lackawanna valley;" that it is a region of large dimensions, extending along the Lackawanna river to its junction with the Susquehanna, embracing within its limits great bodies of coal lands, upon a portion of which are the mines of the complainants, and upon other portions of which are the mines of the Pennsylvania Coal Company, those of the Delaware, Lackawanna, and Western Railroad Company, and those of other smaller operators. The word "Lackawanna," then, was not devised by the complainants. They found it a settled and known appellative of the district in which their coal deposits and those of others were situated. At the time when they began to use it, it was a recognized description of the region, and of course of the earths and minerals in the region.

It may be observed there is no averment that the other coal of the Lackawanna valley differs at all in character or quality from that mined on the complainants' lands. On the contrary, the bill alleges that it cannot easily be distinguished therefrom by inspection. The bill is therefore an attempt to secure to the complainants the exclusive use of the name "Lackawanna coal," as applied, not to any manufacture of theirs, but to that portion of the coal of the Lackawanna valley which they mine and send to market, differing neither in nature or quality from all other coal of the same region.

Undoubtedly words or devices may be adopted as trade marks which are not original inventions of him who adopts them, and courts of equity will protect him against any fraudulent appropriation or imitation of them by others. Property in a trade mark, or rather in the use of a trade mark or name, has very little analogy to that which exists in copyrights or in patents for inventions. Words in common use, with some exceptions, may be adopted if at the time of their adoption they were not employed to designate the same or like articles of production. The office of a trade mark is to point out distinctively the origin or ownership of the article to which it is affixed, or, in other words, to give notice who was the producer. This may in many cases be done by a name, a mark, or a device well known, but not previously applied to the same article.

But though it is not necessary that the word adopted as a trade name should be a new creation, never before known or used, there are some limits to the right of selection. This will be manifest when it is considered that, in all cases where rights to the exclusive use of a trade mark are invaded, it is invariably held that the essence of the wrong consists in the sale of the goods of one manufacturer or vendor as those of another, and that it is only when this false representation is directly or indirectly made that the party who appeals to a court of equity can have relief. This is the doctrine of all the authorities.

No one can apply the name of a district or country to a well known article of commerce, and obtain thereby such an exclusive right to the application as to prevent others inhabiting the district, or dealing in similar articles coming from the district, from truthfully using the same designation. It is only when the adoption or imitation of what is claimed to be a trade mark amounts to a false representation, express or implied, designed or incidental, that there is any title to relief against it.

These principles, founded alike on reason and authority, are decisive of the present case, and they relieve us from the consideration of much that was pressed upon us in the argument. The defendant has advertised for sale and he is selling coal not obtained from the plaintiffs, not mined or brought to market by them, but coal which he purchased from the Pennsylvania Coal Company, or from the Delaware, Lackawanna and Western Railroad Company. He has advertised and sold it as Lackawanna coal. It is in fact coal from the Lackawanna region. It is of the same quality and of the same general appearance as that mined by the complainants. It is taken from the same veins or strata. It is truly described by the term Lackawanna coal, as is the coal of plaintiffs. The description does not point to its origin or ownership, nor indicate in the slightest degree who mined the coal or brought it to market. All the coal taken from that region is known and has been known for years by the trade, and rated in public statistics, as Lackawanna coal.

We are, therefore, of opinion that the defendant has invaded no right to which the plaintiffs can maintain a claim. By advertising and selling coal brought from the Lackawanna valley as Lackawanna coal he has made no false representation, and we see no evidence that he has attempted to sell his coal as and for the coal of the plaintiffs. If the public are led into mistake it is by the truth, not by any false pretence. If the complainants' sales are diminished it is because they are not the only producers of Lackawanna coal, and not because of any fraud of the defendant. The decree of the circuit court dismissing the bill must, therefore, be affirmed.

THE electric light has been introduced into the lighthouse at the South Foreland. This is now the third lighthouse station in England at which the electric light is established, and the French have established one at Cape Grisnez.