The Electric Telegraph.

No. 4.

In our last we promised to treat of what a "patent covered and what it did not." There are many conflicting opinions respecting what is termed a *result*, that is a certain article made that never was made before. Some believe that a patent for such a result as a *new* shoe or a *new* alphabet, or *new* cloth, is not legally the subject of a patent and that the means only to obtain the same result is valid as the subject of a patent. Our laws however and those of all other civilized countries protect by patent the result as well as the means to obtain it, but this cannot be legally covered in one patent. The result must be a subject of itself and so must the means to obtain it. A result however is very easily obviated for the least change in combination essentially alters the features of a result. Thus the telegraphic alphabet of Morse is the legal subject of a patent, but another person dropping his dash and using the dot, produces a totally different result. We make this remark, because tbat many have supposed, and it was contended for at the recent trial at Frankfort, Ky. that Prof. Morse could not legally hold his alphabet (*result*) under a patent, Patents are granted for a new principle, and a new combination, to produce certain results. The combination patent is easily avoided, but if the combination is the limit of improvement, a patent for the said combination is just as good as if it was for a principle, for the changes of combination must produce an inferior result, (an inferior article.)

The patent for a principle might be the subject (to no purpose) of a volume. Every patent should clearly specify the principle of invention and for want of this clearness, we have had many law suits. Nothing suits lawyers better than vaguely specified patents—therefore the impropriety of employing that class as agents to make specifications—those murky productions for the honest trade of the gentlemen of the bar.

In respect to different principles of telegraphing we have already specified four that are perfectly distinct, that might legally be held and operated in one country without any just confliction. It is the great fault with many inventors, those that have money, that they are too jealous of inventors in the same field with themselves. This should not be. Itis perfectly possible that one might invent something this year, and another invent something in the same line next year that would be altogether superior. Let every one make the most of their invention while it lasts and not be too jealous of being superseded. We express no sympathy for the plunderers of principles by a simple equivalent alteration—these men should be rewarded with a just legal infliction. But inventions essentially different in character to produce like results (results not patented) should not be subjects of angry litigation between different parties.

Prof. Wheatstone in England, and Prof. Morse of America, have been blamed for grasping too much in their claims—claiming in opposition that which they never conceived (*invented*) Prof. Wheatstone has made himself notorious for opposing every electric telegraph for which a patent was requested in England. When Prof. Morse applied for one in London, Wheatstone opposed him—the two Professors were regularly pitted against one another, but Wheatstone the plunderer of poor men's inventions, was victorious and the Professor of painting came off with *flying colors*. We hope that Mr. Morse will not be actuated towards other telegraph inventors, with the same spirit which he justly condemned in Lord Campbell and *Puffer* Wheatstone—that he will in the righteous spirit of equal and exact justice, give sea room to those telegraph inventors which he has calmly declared to be *different* from the *Electro Magnet Telegraph*. Some have endeavoured to detract from the merit of Prof. Morse as the inventor of the Electro Magnet Telegraph, and make him indebted to Dr. Jackson of Boston for all his information, he being a passenger in the Sully with Prof. Morse in 1832, and used to converse with him on the subject. It would have looked more candid if Prof. Morse had mentioned the name of the *passenger* with whom he used to converse on the subject while on his voyage from France in 1832. Yet what of all this, we have no evidence that Dr. Jackson ever constructed an electric telegraph, and although Prof. Henry gives tardy praise to Mr. Morse, the names of great scientific men should not be allowed to weigh as a feather in the balance against a successful inventor but a less distinguished man of science. For more than 30 years Sir Humphrey Davy had the world wide honor of being the first inventor of the Safety Lamp, and it was not till the summer of 1848, that the inventor, Geo. Stevenson the mechanic, was acknowledged before a high Scientific Association. There is another kind of telegraph which we have not yet described, viz. the printing telegraph.—We see that House's has lately occupied much attention—but this is a borrowed invention—essentially so, as we shall prove in another article.

Levelling.

A pole about 10 feet long must be procured and also a staff about 5 feet long, on the top of which is fixed a spirit level, with small sight holes at the ends, so that when the spirit level is perfectly horizontal the eye may view any object before it through the sights in a perfectly horizontal line. If you have to measure the perpendicular distance between the bottom and top of a hill for instance; place the level staff on the side of the hill in such a way that when the level is truly set the top of the hill may be seen through the sights; keep the level in this position and look the contrary way; then cause some person to place the 10 feet staff before the sight further down the hill and looking through the sights to the staff cause the person to move his finger up or down the staff until the finger be seen through the sights and mark the position of the finger on the staff. Keep your 10 feet staff in the same place and carry your level staff down the hill to a convenient distance, then fix it in the same way as before; and looking through the sights at the 10 feet staff, cause the person to bring his finger towards the bottom of the staff and move his finger up or down the staff in the same way until it be seen through the sights and mark the place of the finger. Then the distance between the two fingers' marks, added to the height of the level staff will be the perpendicular distance between the place where the level staff now stands and the top of the hill. The process is perfectly simple, and it will not be difficult to repeat it ottener, if the height of the hill requires it.

This process will give what is called the apparent level, which, however, is not the true level. Two stations are on the same true level when they are equally distant from the centre of the earth. The apparent level gives the objects in the same straight line but the true level gives the line which joins them as a part of a circle whose centre is the centre of the earth. In small distances there is no sensible difference between the true and apparent level of any two objects. When the distance is one mile the true level will be about 8 inches different from the apparent level. This will serve well enough to remember, but more correctly speaking it is 7. 962 inches for 1 mile, and for other distances the difference of the two levels will be as the square of the distance. Thus at the distance of two miles it will be $1+1=2X2=4X8=32$ inches.

These circumstances must be strictly observed in the formation of canals, and railways.

Baths in Russia.

In Russia they have Sweating or Vapor Baths which are resorted to by persons of all classes, rich and poor free of expense because these baths are supported and kept up by the government. Here mingle together the beggar, the artisan, the peasant and the nobleman to enjoy the luxuries of a steam or sweating bath in both sickness and health. The method as pursued by them to produce the vapor bath is simply by throwing water on red hot stones in a close room, which raises the heat from 150 to 168 degrees; making when at 168 degrees, above a heat capable of melting wax and only twelve degrees below that for boiling spirit of wine. In this tremendous and excessive heat which on an American would produce suffocation, the Russian enjoys what to him is a comfortable luxury of the vapor-bath, which shows clearly the wonderful force of habit among mankind. In these bath-houses are constructed benches on which they lie naked and continue in a profuse sweat forthe lapse of one, and sometimes two hours, occasionally washing or pouring over their bodies warm or cold water. During the sweating stage the body is well rubbed or gently whipped with leafy branches of the birch tree to promote perspiration by opening the pores of the skin. A Russian thinks nothing of rushing from the bath room dissolved in sweat and jumping into the cold and chilling waters of an adjacent river; or, during the most piercing cold to which his country is liable in winter, to roll himself in the snow; and this without the slightest injury. On the contrary he derives many advantages from these sudden changes and abrupt exposures; because bv them he always hardens his constitution to all the severities of a climate whose colds and snows seems to paralyze the face of nature. Rheumatisms are seldom known in Russia; which is certainly owing to their habit of thus taking the vapor bath. The great and sudden transition from heat to cold seems to us very dangerous and unnatural; but we have no doubt the Russians owe their longevity their healthy and robust constitutions, their exemption from certain mortal diseases and their cheerful and vivacious tempers, to these baths and their general temperate mode of living.

Oxidation of the Diamond the Liquid in Way.

Professors R. E. and W. B. Rogers, of Virginia, lately published some of the processes by which the diamond may be converted into carbonic acid with only a moderate heat, by the use of simple chemical agents. The processes for oxidizing the diamond hitherto practised was by burning this gem, either in the air or in oxygen gas, or in some substance rich in oxygen, as nitrate of potasa. In all these experimenrs a great heat is required. It is therefore interesting to discover that the diamond may be converted into carbonic acid in the liquid way and at a moderate heat by the reaction of a mixture of bichromate of potassa and sulphuric acid—in other words, by the oxidating power of chromic acid. To succeed in this experiment, it is necessary to reduce the diamond to the most minute state of division A single grain of the gem will suffice for many experiments. In repeated trials more than half a grain has never been used—and clear evidence of the oxidation has been obtained by the evolution of carbonic acid. The bichromate of potash when heated is always found to afford some carbonic acid, —but error is avoided by first heating the acid alone in the retort to above 350°, then adding the bichromate by degrees, and stirring the mixture so as to effect a complete separation of chromic acid A very brisk reaction takes place—much oxygen is disengaged and with it any carbonic acid which the materials themselves are capable of evolving. When no more carbonic acid can be detected by lime water tests, the powdered diamond is carefully added. The evolution of carbonic acid, continues the Professors R., is soon evinced by the growing milkiness of lime water, and this continues slowly to increase as long as there is any free chromic acid in the retort. The chief point of interest in the subject however, is the fact—now published for the first time—that the diamond is capable of being oxidated in the liquid way and at a comparatively moderate temperature—varying between 250 and 440 degrees.

A New Cave Explored.

Professor Carroll, with thirteen pupils of Mercer University explored a second mammoth cave in August last which is entered through Raccoon mountain on the dividing line between Tennessee and Georgia; and which is called the Student's Cave. A communication in the Savannah Republican gives these descriptions:

"The peculiar feature in the cave is that it consists of an irregular passage or entry, with rooms and in some cases suites of rooms, opening at irregular distances on each side. The width of the entry is about twenty feet and the roof varies from five to sixty feet in height. The floor is in some places even though generally it is covered with masses of fallen rock and disfigured by yawning caverns which it required much care to pass over in safety.—The ceiling is in no place smooth, but there hang from it short stalactites, which can be compared to nothing better than a washer-woman's smoothing-irons fastened by the handles to the roof and hanging an inch or two apart.

Down this entry this party passed for half a mile until they came to where it swells out to large dimensions and descends very abruptly for quite a hundred feet forming a huge and unsightly chamber. Terminating their exploration in this direction here they retraced their steps. About four hundred yards from the entrance however is to be found the most attractive part of the cave through which they passed. Here a noble and lofty dome with all its proportions perfect spanned the entire passage. On the right to our coming from the entrance and immediately under the dome, about ten feet from the floor, there is a deep recess formed by a bold curve of the wall, on each side. The back ground of this recess is filled up by the appearance of a splendid Grecian temple which would not suffer in comparison with the Parthenon in its best days Aided a little by the excitement of the visiter and by the shadows cast by the lights the facade is perfect. A little back of the regular line of the wall extends a row of massive fluted columns pediment and all, while in the rear still appears the body of the temple: the door in the right place and of the right dimensions and all the proportions perfect.

On the left of the passage and under the same dome, ascends a regular winding stairway about five feet in width. The walls are of stalactite formation in some places as smooth as glass, in others grooved and in others still plastered, and they glittered in the torchlight light like polished diamonds. When they had ascended this stairway some thirty five feet they came to a wall which closed it up at right angles. In the middle of this wall, and about three feet from the floor, there is an opening about a foot and a half in diameter, through which they crawled. And here they entered into a suite of rooms gorgeous beyond description. The first was a small antechamber about twelve feet in diameter; the walls of stalactite and the floor of stalagmite, and the ceiling so high that with all three of their torches together they could not get a glimpse at it.

On the farther side of the chamber near the entrance to the next room were two splendid columns each about two feet and a half in diameter,—that on the right side seemed to be made of large translucent shell, (resembling those beautiful shells that ornament the mantles of the rich) and so high as to be lost in the darkness above—the one on the left appeared as perfect a Corinthian column, gorgeous capital and all, as art could fashion.—Passing between these and through an arched doorway they entered into another large room; here was almost every variety of stalagmite formation that can be imagined Statues, pyramids and shafts studded the floor in splendid profusion. Gorgeous columns extended up to the ceiling and heavy stalactites terminating below in their curled leaves reached down to within three feet of the floor. One of these when struck sounded like the tolling of a large bell, another gave forth the deep tones of the largest pipes of the organ, not faintly but filling with its loud peal the whole compass of the cavern while its rich note swelled and reverberated in the arches below.

The next chamber seemed to be a regular wardrobe with ladies dresses hanging all around the walls, every fold in the garments being as distinctly marked as if they were veritable dresses. In the fourth room on a smooth place on the wall the party wrote their names and the date of their visit with charcoal, which has doubtless long before this been obliterated. To this suite of rooms they gave the name of Cathedral."

A person describing the absurdity of a man dancing the Polka, appropriately said, that it appeared as if the individual had a hole in his pocket, and was vainly endeavoring to shake a shilling down the leg of his trowsers.