

Scientific American.

NEW YORK, MARCH 14, 1857.

Civil Engineering Abroad.

Two Stephensons have already immortalized their names as civil engineers, George, the father of railroads, and one of the first constructors and ablest advocates of locomotives, and Robert, his son, the engineer of some of the mightiest works in Great Britain, and of the Victoria Bridge, two miles long, at Montreal. A third, R. Macdonald Stephenson, has just been knighted for his success in designing and so far carrying forward the great network of railroads now being constructed in India.

We condense the following summary view of the works now going forward from an address given at the annual meeting of the British Institution of Civil Engineers. A system of electric telegraphs had been extended over nearly 4000 miles, through dense jungles, or over the vast plains, rivers and mountains of India. The Indian Peninsular railway had now about 100 miles opened, and various extensions were progressing. The Madras, the Bombay and Baroda, and the Scinde railways, were being vigorously prosecuted, and several other lines were projected, among which was that from Seleucia, on the Mediterranean, to Jabr Castle, on the Euphrates, which river it was proposed to navigate by means of steam vessels of shallow draught of water. Since the kingdom of Oude had become a part of the British possessions the railway system would be commenced there by the construction of a line of fifty miles in length, whence branches would extend to the most important districts, and be connected with the East Indian railway.

The "Don Pedro the Second" railway, starting from Rio Janeiro, and passing up the Serra into the valley of the Parahiba, and through the principal coffee producing districts, would be about 200 miles in length. The first section of forty miles was commenced in 1855, and would be completed by about the middle of next year. The survey was made amidst a dense primeval forest, and in many places through water five or six feet deep, and great difficulty was encountered in executing the earthworks with slave labor and inadequate tools. By degrees, however, European methods were introduced. English engineers were also constructing important hydraulic works at Rio Janeiro, formed of granite masonry, set in lias mortar, for which the limestone was sent from England.

In Canada, the Grand Trunk Railway might be said to be complete, with the exception of the link to be formed by the Victoria Tubular Bridge across the River St. Lawrence, which was now in progress.

In Europe, gradual extensions of all the main lines were being made. The Lombardo-Venetian system had been transferred to a powerful company. The "Victor Emmanuel" line was approaching the chain of the Alps, for the traversing of which preparations were being made, and experiments upon the machinery for the work of tunnelling on a large scale were being tried.

In Turkey, and in Russia, extensive projects both for railways and steam navigation were being agitated; whilst in Egypt, H. H., the energetic Said Pacha, was completing the railway communication between Cairo and Suez, spanning the Nile by a vast iron bridge at Kaffre Azzayat, and had confided to Mungel Bey the construction of the preliminary works for the canal across the Isthmus of Suez, whilst he had authorized the establishment upon the Nile and the Mahmoudich Canal of a complete system of steam-towing vessels and barges.

It is worthy of remark to how great an extent English engineering skill seems to be employed in all these wide sundered points. Members of the Institution of Civil Engineers seem to figure in some capacity in all these situations, and although something must be allowed for the effort at congratulation naturally to be expected in such an address, it is evident that this bringing of minds to-

gether in such institutions is productive of much benefit. Can we not have such associations in some form in this country?

Inventions Wanted.

Some of the best wheat lands in Maryland and Virginia are extremely flat, and from the extreme fineness of division of its particles require a number of drains called water furrows, which are made by the plow in finishing each bed or ridge. But one objection to this mode of doing the work is that it makes and leaves a shoulder, or abrupt furrow slice lying on the edge of the bed throughout its whole length, sometimes almost perpendicular, and often overhanging the water furrow more or less, and constantly falling back into it by its own weight, or washed in by rains, or heaved in by frost.

Assuming that the labor of "striking back," or drawing away this toppling furrow slice to a proper grade with the hoe, is too great, the Southern Planter inquires for a plan for doing it by horse power.

"Suppose the water furrow shall be left by the plow eight or ten inches deep by twenty inches wide at top, could not an implement with two mold-boards, perhaps with an extrawing on each mold-board, and the whole adjustable to greater or less width of furrow, be contrived to do the work? The mold-boards and wings, if they are attached, should be sloped on the under side, from the bottom of the furrow to only enough width at the ends to give them strength so as to grade the dirt by wasting it gradually on the bed. The distance from tip to tip should not be less than two feet on each side of the bed."

Rewards for such an implement have been offered by agricultural societies, and individuals have added to the same, so that, although the whole sum, some \$80, is too trifling to be any inducement, it serves to show that a want is really felt.

Breakings of the Dover Submarine Telegraph Cable.

We paid no attention to the following when we first found it in a corner of an obscure Canadian paper, but finding it now in the London *Artizan* for February, credited to the London *Times*, we give it for what it is worth, whether a hoax or not. There are three submarine cables from England to the Continent, as indicated by our map on another page:—

"An accident happened to the submarine line across the Channel, and telegraphic communication with the Continent was temporarily delayed in consequence. During the fearful gales on the 5th inst. a ship of 700 tons, very heavily laden, lost her anchor in the Downs, and, driven by the force of the gale and tide, fouled a schooner, and then, becoming more unmanageable, drifted into five fathoms of water. An anchor was speedily let go, with forty fathoms of chain attached; but the barque, still impelled by the unusual force of the gale, dragged her anchor until she was brought up sharply, head to wind, on opening the western light of the South Foreland. It is found that she here came upon the Submarine Company's Ostend cable. The hurricane, the tide, the weight of the ship, and the necessity of keeping her foretopsail aback to drift into deep water, worked so much upon the submarine line, that, after holding her for some length of time, the cable giving way, she instantly swung round before the wind, and was careering forward with increased velocity, when she was suddenly brought up, head to wind again, by the Calais cable. The barque was held, in spite of the heavy sea, the gale, and the pressure of the wind on her sails, for about an hour, when once more she broke away, and sailed off down the Channel. Both submarine lines, unfortunately, became unworkable in consequence of this untoward accident, and communication with the Continent was partially stopped. The sea at the point where the vessel caught the cables is about fourteen fathoms deep only, and the spot is within three-quarters of a mile from the shore. The Company have already made arrangements to repair the cables the moment the weather will permit. Meantime messages are being telegraphed to Dover, sent thence by the steamer, which leaves thrice daily, to Calais, and are from Calais telegraphed to their various des-

tinations. It is supposed that, the weather proving favorable, both cables might be completely repaired in the course of a day."

Patent Suit—Charge of False Pretences.

A case of some interest relating to the transfer of patent property was tried week before last in Rochester, this State. R. N. Robbins purchased of J. Gorton a patent right on credit, giving as security a mortgage which proved to be worthless, for which transaction Robbins was subsequently indicted for the crime of false pretences. The case was tried in the Court of Sessions before Judge Munger. As reported in the Rochester *Advertiser*, the three principal points necessary for the Court and jury to pass upon were, first, the guilty knowledge, or the *scienter*, as the lawyers term it, on the part of Robbins; second, the value of the property parted with by Gorton, and third, the nature of the instrument he signed when he parted with his interest in the patent right. On the second point there arose a question which, we believe, has never before been discussed under our present statute of false pretences, viz.: whether an invention proved to be impracticable, is a "valuable thing," under the statute, which reads as follows:—"Any person who shall obtain any money, personal property, or valuable thing," &c. Upon this point the defence contended that "the value of a patent right does not consist in the paper upon which the government contract is expressed; nor in the benefit that may be derived from the protection it affords; neither does it consist in the assurance it gives that an exclusive monopoly may be enjoyed; but the value of every patent right depends, as far as the owner is concerned, upon the profit derived from the sale of the article it assumes to protect. A patent right is not worth the paper upon which it is written, unless the owner or community can derive some benefit from it."

The main point upon which the whole case turned in a strictly legal sense was, that the instruments signed by Gorton was *in praesenti*. In other words, the writing was in the nature of a quit-claim deed, and did not convey only the interest of the party signing it; therefore, as he had only parted with his interest, and had made no covenant upon which he could be sued, it was reasonable to suppose that the signing of the instrument could work no injury to him, which it was necessary that it should do, (following the decisions under the statute,) in order to hold the party charged with false pretences. However had the prosecution proved an ownership, which they failed to do, in the patent right which Gorton assigned, then the case should have been different.

The jury, after being out about eight hours, came into Court and stated that they could not agree, and were discharged by the Court. They stood ten for acquittal and two for conviction.

Great National Trial of Agricultural Machinery.

The Committee of the United States Agricultural Society, appointed at the fifth annual meeting, held at the Smithsonian Institution, Washington, D. C., on the 14th of January, 1857, "to designate the time and places, and to make all the necessary arrangements for a national trial in the field of agricultural implements and machinery," respectfully invite the inventors and manufacturers of all such articles, both in the United States and foreign countries, to participate in a public trial, to be made at Louisville, Ky., under the auspices of the society, during the fall of 1857.

A separate trial of reapers and mowers will be made at the appropriate season, special arrangements for which, as to time, place, &c., will be announced at an early date.

All articles from foreign countries, intended for exhibition, may be consigned to the "Agent of the United States Agricultural Society, Louisville, Ky.," by whom they will be received and stored free of charge.

This brief announcement of the proposed trial is made at this early date, to afford the most ample time for the preparation and transmission of machinery. A circular, containing full particulars as to regulations, premiums, &c., will be issued as soon as prepared by the committee, and will be forwarded to

persons who may apply to the Secretary, Henry S. Olcott, American Institute, New York.

Relief Pictures.

On the 20th of January last, J. Bishop Hall, of this city, obtained a patent for a peculiar method of treating pictures to produce a high degree of artistic and stereoscopic effect of objects, applicable to photographs, engravings, lithographs, and similar pictures. The principle of the invention consists in combining two or more photographic or other prints to form one picture. The pictures must be fac-similes or duplicate impressions, on semi-transparent material. If the invention is to be applied to photographs, let two copies be taken in the usual way, upon photographic paper. The paper of the two pictures is then rendered somewhat transparent by the application of oil to it. Each picture is then to be cemented to a separate plate of glass by means of copal or other suitable transparent varnish, which must be previously applied to the glass, and partially dried—attained to the state called *tacky*. In applying the picture to the glass, care must be taken to press out all the air bubbles between the paper and glass. Each picture is then allowed to become dry, or nearly so, when it will be well to scrape off the back carefully to remove any excrescences. After this is accomplished, one or more coats of copal or other suitable varnish is applied to the pictures; when these are dry, the two plates of glass are joined together in such a manner that the lines of the pictures coincide, in which position they are cemented or framed together, and excluded from the atmosphere.

This is a description of the invention in its simplest form. Different effects may be produced when the front picture only is executed or attached to the plate of glass, and the second one placed some distance behind it so as to correspond with the other. Fine effects are produced by cutting out certain parts of the back picture, thus allowing more light to pass to the front one. Colors may be applied to the back picture only or partially to the two, so that one color on the front picture may have a ground of another color. A back-ground of white light, or reflecting material, placed behind the pictures, such as enamelled white paper or a plate of enamelled white china, produces good effects. The back-ground may also be silvered over to produce effects according to the taste of the operator. The idea of thus combining two or more pictures, printed on paper, or taken by photography—to make them appear like solid pictures, is certainly an ingenious and quite artistic invention.

Pictures produced according to this process are called *Hallotypes*. They have an appearance something like wax figures, but on the whole are artistic and beautiful. A number of them are on exhibition at Gurney's daguerreotype rooms, Broadway, in this city. The back-ground of them is dark, and the figures are colored, and in our opinion they produce a very fine effect.

Stirling Toughened Iron.

In the foreign prices current of metals the above words are frequently found, and it may be interesting to many to learn the character of the material. Morries Stirling is the inventor of a process substantially of dissolving wrought iron particles in cast iron, the result being a fusible metal sensibly stronger and tougher than ordinary cast iron. It had been supposed impossible until demonstrated by this gentleman, that iron once puddled or otherwise made malleable iron, could again be melted and poured, but it has since been done by many for various purposes. Mr Edward Lyon, an ingenious foundryman of this city, melts fine turnings, filings, and chip-pings of all kinds of iron indiscriminately by a peculiar arrangement of the materials in the furnace so as not to choke the draught, and when the quantity of wrought iron among the same is not excessive produces therefrom a very tough and tolerably ready flowing metal. It is not generally known that such fine particles are available, and they are frequently thrown away or what is pretty nearly equivalent, mixed with earth, to form a kind of cement for hardening roadways and dams.