

Communications.

Our Washington Correspondence.

To the Editor of the Scientific American:

The Commissioner of Patents has rendered a decision in the interference between Messrs. Sargent and Little, awarding priority to Sargent. This is said to be one of the most important of all the various applications which the inventor has had before the Office, and he has had many, as it is believed to cover the use of a time lock with a combination lock on the same safe or vault door when each acts independent of the other on the "bolt-work." The application has been in litigation for over two years, and has been in interference with five different applications of various lock inventors, in all of which Mr. Sargent came out the victor.

Mr. Hunt, who was suspended from practice, as mentioned in a previous letter of mine, is making endeavors to have the Secretary of the Interior set aside the action of the Commissioner of Patents in suspending him, and also to compel the latter to allow the reissue patent to go out, about which the trouble originally arose. Hunt's attorneys were heard on Saturday last by Assistant Attorney-General Marble, but up to the time of this writing the decision has not been promulgated. It is understood, however, that he will recommend that the present order of suspension be withdrawn for irregularity, and that a temporary order shall be issued suspending Mr. Hunt until he has shown cause why the order should not be permanent.

I hear that Mr. Hunt takes exception to my statement that his papers were prepared by a brother of the assistant examiner, by saying that he prepared it himself. It is possible that I was wrong as to the actual preparation of the papers; but it is certain that the gentleman mentioned was the attorney in the case, as is shown by Mr. Hunt's own circular; and as the attorney most always prepares the application, my informant had good grounds for supposing that he did so in this case.

An important extension case was heard by the Commissioner on Saturday last, relating to the Voelter wood-pulping patent, which has already had one extension, and is now up for another by order of Congress. The decision has not yet been made, but will probably be given before this is printed.

The State Department has been officially advised that the French Government has reiterated its determination to open the Paris Exposition on the 1st of May next, and that detailed regulations for the information of exhibitors have been published. It is believed that our government will not be able to make any arrangement for American participation until Congress shall have met, there being no law authorizing the appointment of a permanent commission and no appropriation out of which the necessary expenses can be defrayed. I do not hear anything of the provisional commission proposed sometime since.

Secretary Thompson has written a letter to Captain Howgate of the Polar Expedition informing him that he cannot comply with his application that Captain Tyson, now in the service of the Navy Department, should be detailed for the expedition, and that he cannot, much to his regret, comply with Captain Howgate's other request for the loan of instruments belonging to the Navy Department for the use of the expedition. It is said, however, that this will not prevent Captain Tyson going into the expedition, as he has been granted leave of absence for that purpose but without pay. He will command the Florence, and will be paid by Captain Howgate.

The Woodward Expedition has been under discussion by the Cabinet, but I cannot learn that any assistance or official countenance is to be given to this party.

The War Department has issued a general order for facilitating the prosecution of the topographical surveys in the western military divisions and departments—including reconnaissance of routes, the astronomical determination of the positions of military posts, etc., and the drafting of maps—and holding in view uniformity of action and a systematic plan. The general plan of exploration and survey will be determined by the Chief of Engineers, and executed under the direction of the generals commanding by division and department engineers. The results of these surveys will be promptly transmitted to the chief engineers and also incorporated in the general maps of divisions and departments.

Dr. J. D. Hooker, President of the Royal Society of London, and Lieut.-Gen. Strachey, of the Royal Bengal Engineers, have also organized, through the assistance of friends in this city, an expedition for scientific research through the summer in Colorado, Utah, and California, in company with Dr. Asa Gray, of Cambridge, and Professor Joseph Seidy, of Philadelphia, the former celebrated as a botanist and the latter as a comparative anatomist. The results of their discoveries will be communicated to our government in the form of reports, and it is believed that they will be of great value, without involving any expense to the nation, as the costs will be defrayed by the gentlemen who compose the expedition.

Information has been received at the State Department that the International Geographical Conference, lately in session in Brussels, appointed an executive committee to sit in the interval between its adjournment and its future meeting, on which Mr. Henry Sanford was appointed to represent the United States and Sir Bartle Frere as the member for Great Britain.

Our Consul General at Berlin informs the same department that the collection of locks and tools of American

manufacture, on exhibition in that city in the building of the Berlin Association of Architects, under the auspices of that body, compare most favorably with other similar manufactures there exhibited, in quality and workmanship, or cheapness, and with proper efforts to introduce them they cannot fail to find an extensive and profitable market in Germany. A collection of American furniture was also on exhibition and received much commendation.

The same department has received a report from our Consul at Sonneburg, relative to the rinderpest. He says the poison of the disease is most difficult to destroy, attaches itself readily to all substances, and may be communicated for an indefinite period, but thinks that there need be no fear that either infected hides or other poisonous articles will be exported to this country from German ports.

The Department of Agriculture reports oats in superior condition in New England, in most of the Southern States, in those of the Missouri valley and in Oregon, and in fair to high condition in all the remainder, except California. The South is finding immunity from loss in their red rust-proof variety. The indications are favorable for a good yield of barley.

An investigation by the same department has been made regarding the loss of sheep, which shows that during the past year a total of nearly three millions of sheep and lambs have been destroyed by dogs, wolves, and disease, of an aggregate value of nearly \$8,000,000.

The new Commissioner of this Department (Agricultural) strongly endorses and will give all possible aid for a fair test of the proposed plan for giving, by telegraph and signal cannon, general and instant warning of coming storms, for the benefit of agriculturists during the hay and grain harvests, and also of shipping, and to give warning of sudden destructive floods on rapid rivers. The system has been pretty generally endorsed by prominent citizens, and it is now proposed to lay the matter before the Secretary of War, with the above mentioned recommendations and such others which may be sent by county and State agricultural societies, with the request that he will order a test to be made at all forts, arsenals, navy yards, barracks, etc., in the populous States, so that if successful it may be extended to all the principal towns and villages.

One of Professor Baird's assistants passed through this city on Saturday with 100,000 young shad that were hatched at the South Hadley Falls propagating gardens, to be deposited in the Cattoochee river, Ga., at Columbus and West Point.

The July returns of the condition of cotton, as stated by the department, cover the entire area of 361 counties, and these counties produce six tenths of the cotton grown in the United States. The average condition of these counties is 93 $\frac{1}{2}$ per cent, or less by 7 per cent than the average for 1876. The crop is from one to two weeks later, owing to cold in some sections and excess of rain in others. Insects have done but little damage. Labor is said to be becoming gradually more efficient, and an improvement both in *morale* and efficiency is reported from Louisiana.

The appropriations for the navy for the new fiscal year having become available, an order has been sent out for the immediate fitting out of a number of vessels of war, and the work at the navy yards has been resumed. The following vessels are to be fitted out at the places named: The Alaska and Guard, at New York; the Wachuset, at Boston; the Canandaigua and Galena, at Norfolk; the Quinnebaug, at Philadelphia; the Benicia and Troquois, at Mare Island; and the Wyoming, in this city.

The Government has decided that the act of June 18, 1868, declaring that eight hours shall constitute a day's work for all laborers and mechanics employed by the Government, does not prevent officers from making agreements by which a day's labor may be more or less than eight hours; and an order has therefore been issued that officers in charge of public work shall make their contracts and have the work performed upon the basis of ten hours to a day's work, and that all persons who desire to work only eight hours per day shall be paid for that number of hours and no more.

As stated in a previous letter, a number of Parrott guns are being converted into breech-loaders at the Parrott foundry, and the Ordnance Bureau has concluded to adopt the slotted screw—or what is known as the French system—in converting these guns. This system has also been adopted by several foreign governments who, after careful experiments, found it to be the most suitable for converted ordnance.

A new system of signals, the invention of Lieut. Commander Very, of the navy, is about to be introduced, in place of the Coston signal, which has been in use for some time past. These signals have the appearance of Roman candles, in two colors, which by time intervals will indicate the numerals and will enable the vessels using them to have as perfect understanding with each other as with flags in the day time. The Very signals will be projected to a height of about 250 feet by means of a pistol designed for that purpose, and will thus be visible at a great distance. The inventor of the system has given the Government the right to make and use the signals for five years.

The Treasury Department has made up a statement of the statistics of the wrecks that have occurred within the range of the life-saving service during the past fiscal year, from which it appears that 120 vessels were driven ashore by stress of weather, and that they had on board 1,253 persons, of which 1,214 were saved and 39 lost, or about three per cent of those imperilled. The estimated value of the vessels

wrecked is \$1,746,464, and of their cargoes \$1,348,876, making a total value of \$3,095,331, of which, so far as reported, \$1,554,505 was saved. Upon fifty of the wrecks the life-saving service apparatus was successfully used and 898 persons rescued through its instrumentality. Notwithstanding the gratifying success shown by the number saved by the apparatus, efforts are being made to improve it by Mr. Kimball, who has charge of the service, and Captain Merriam, the inspector, who has devoted much attention to the subject of extending the range of the shot line; and after a series of experiments at Cold Spring, N. Y., with a new gun and projectile invented by R. P. Parrott (the well-known gun founder), they find that with a gun, which with its carriage weighs less by 20 lbs. than the mortar now used at the stations, and some modification of the line, a range of more than 100 yards additional has been attained for the shot line. The department has ordered 24 of the new guns, which will be supplied to those points along the coast where a long range is required. Addition signals are also being prepared to facilitate communication between the vessels and shore, which will be incorporated into the national code of signals.

The first annual report on the internal commerce of the country has just been printed. It covers a wide range of subjects, that of railroads being treated at considerable length. It is noted that the entire amount of the contributions of the Government, to the close of last year, in aid of railroad construction, including land grants and subsidies to Pacific railways, is only three per cent of the total cost of the railroad system of the United States. The value of our internal commerce is stated to be twenty-five times the value of our foreign trade.

The Chief of the Bureau of Statistics has published a detailed statement of the value of and duties derived from imported commodities which were sold at the Philadelphia Exhibition in 1876, from which it appears that clocks and watches sold to the value of \$46,102, yielding \$13,208 in duties; china and earthenware sold for \$88,429, yielding \$40,325 duties; glass and manufactures thereof, \$43,706, duties on do., \$15,178; gold and silver manufactures, plated ware, and jewelry sold to the value of \$51,146, yielding \$29,212 in duties; iron and steel and manufactures thereof, sold to the value of \$83,615, yielding duties of \$29,212; painting and statuary sold for \$94,286, and yielded \$9,428 (10 per cent) in duties; and manufactures of wood sold to the value \$73,371, and yielded \$25,680 in duties. The total value sold was \$731,593, and the total amount of duties \$250,664.

Washington, D. C.

OCCASIONAL.

Expansion by Hardening.

To the Editor of the Scientific American:

It is claimed by some mechanics that steel always increases its dimensions in every direction from being hardened, and this I know to be sometimes the case. On the other hand it is contended that a piece of steel will get larger diametrically but shorter in length from being hardened, and this I have found to be *sometimes* so; but the increase diametrically, in both round and square pieces, is always out of proportion, and greater in amount than is the variation in length. I have taken working gear and refitted it by simply hardening the parts. Very few seem to have any precise knowledge upon this subject, and I recently noticed an article from a person in a mechanical paper who made a gross blunder from want of knowledge. He was speaking of threads and nuts lathed—of their being made to the one thousandth of an inch; he meant well enough, no doubt, but if he ever takes a piece of sheet iron and files at each end of it a V projection, to fit the threads of a tap, and then tries it along the tap in several places, he will divide his thousandths by about 20, for he will find his gage Vs too wide apart in one place and too close together in another portion of the same tap. Neither Whitworth nor the Morse Twist Drill Company will undertake to make a tap with a thread that will successfully stand the above named test, and the man that invents any practical method of making taps that will stand it successfully will leave a mark in the history of mechanism that will live for ages. Has it never occurred to you that it is strange that nuts which are under severe strain come loose upon the threads, although they are not supposed to move at all? Well, the reason is that the sides of the threads of the nut and tap don't fit the dies that cut them; the threads warped in hardening, and so did the tap. No two sets of dies are alike. No two taps are alike. Hence no bolt and nut can fit in the threads with the accuracy that other mechanical fits can be made.

If any one wishes to test this fact, let him take a screw bolt, say 4 inches long, then take a tap and tap a nut having a hole an inch deep, and also a nut having a hole 3 inches deep, using the same tap in each case. If the first nut fits the bolt easy enough to be just turned by hand, ten to one but the second nut will take very heavy pulling with a wrench by the time the bolt projects through the nut. Mechanics are hardening the working parts of machinery more than was formerly done, and nobody seems to take any interest in enlightening us by giving us the benefit of their experience.

Let us take a piece of steel, an untapped nut, for instance, and carefully gage it before and after hardening it; we will find after hardening that its dimensions have increased in all directions, except in the hole, and there the dimension has diminished. This seems an anomaly; for if the surface metal of the outer diameter has elongated, why should not the surface of the hole have increased also? The only explanation I can give is that the metal must expand in the direction in

which it has the most liberty. The center of the solid metal, between the hole and outside, is the strongest section; and taking that as a line, the outside metal is forced outwards in all directions, expanding the metal outside of that line, while inside of the line it is compressed. The diameter of the hole is reduced in order to make room for the expansion. There must, however, be two such sections or lines, one the center of the strength lengthwise of the metal, and the other the center of the strength diametrically of the piece. If our piece of work had no hole in it, all the expansion would take place externally.

In turning bolts in the lathe many workmen make an allowance for swelling in hardening, and they hit the mark remarkably successfully as a rule, though I never heard of any rule to go by, for it is different in different diameters. Care must be taken to allow little enough, because a hole too small may be lapped out, whereas one too large is a proportionately spoiled job. Small work swells by hardening more in proportion than larger work. What the proportion is, and whether it all increases uniformly, I have never kept any notes to indicate. Wrought iron work acts the same as steel, except that in small work I believe the enlargement to be greater than in large work. Here, however, I may say that by small work I mean work that is three inches and less in diameter, and about six inches long. By large work, say six inches in diameter by about ten inches long, or longer than this measurement.

MACHINIST.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

Positions of Planets for August, 1877.

Mercury.

On August 1, Mercury rises at 6h. 3m. A.M., and sets at 7h. 56m. P.M. On the 31st, Mercury rises at 7h. 52m. A.M., and sets at 7h. 20m. P.M. Mercury is small and will not be easily found, but should be looked for after sunset, and late in August, south of the point where the sun sets.

Venus.

Venus is so much brighter than Mercury that it can be seen all through the month of August for a short time after sunset.

On August 1, Venus rises at 6h. 57m. A.M., and sets at 8h. 23m. P.M. On August 31, Venus rises at 8h. 6m. A.M., and sets at 7h. 44m. P.M.

Mars.

On August 1, Mars rises at 9h. 19m. P.M., and sets at 8h. 09m. A.M. of the next day. On the 31st, Mars rises at 7h. 15m. P.M., and sets at 5h. 49m. A.M. of the next day.

Mars is coming into better and better position for evening observation, and will, by the latter part of August, be very conspicuous in the southern sky. Saturn and Mars rise and set nearly at the same time all through the month, Saturn being some degrees above Mars when on the meridian.

Jupiter.

On August 1, Jupiter rises at 4h. 22m. P.M., and sets at 1h. 23m. of the next morning. On the 31st, Jupiter rises at 2h. 23m. P.M., and sets at 11h. 23m. P.M. The best time to look at Jupiter during August will be from 7h. 0m. to 9h. P.M.

On August 1 the largest satellite (according to the *Nautical Almanac*) will make a transit across the disk of Jupiter during these hours, and will not be seen; Jupiter will seem to have but three moons. On the 4th the moon nearest to Jupiter will not be seen because it is behind the planet at the hour from 8 to 9 P.M. On August 9 the smallest of the moons will not be seen until 9 P.M., because it passes in front of the planet. On August 12 the largest moon will not be seen until near 8 P.M., having been in the planet's shadow, and the first or nearest to Jupiter will not be seen until after 9 P.M., having been passing across the face of Jupiter. This same moon is not seen on the 13th until near 8 P.M., because it is in the planet's shadow; again, on the 27th, it is not seen after 8 P.M., because it is behind the planet.

The smallest satellite disappears on the 16th a little after 8 P.M., by coming in front of the planet, and on the 25th it disappears by getting into Jupiter's shadow.

On August 19 the largest satellite will disappear by going into the shadow of Jupiter, and on the 26th it will not be seen between 8 and 9 P.M., being behind the planet.

Saturn.

On August 1, Saturn rises at 9h. 3m. P.M., and sets at 8h. 19m. the next morning. On the 31st, Saturn rises at 7h. 1m. P.M., and sets at 6h. 10m. the next morning.

Saturn and Mars rise at nearly the same time during the month. They are much higher in the southern sky, when they come to the meridian, than Jupiter. On the 2th, Saturn will be at meridian passage (12h. 57m.) directly above Mars, and have an altitude above the southern horizon of 41°. In the latter part of August, Venus, Mars, Saturn, and Jupiter can all be seen early in the evening.

Uranus.

Uranus can rarely be seen without a glass, but an ordinary telescope will show its disk—it is not at present well situated.

On August 1, Uranus rises at 6h. 13m. A.M., and sets at 7h. 57m. P.M. On August 31, Uranus rises at 4h. 21m. A.M., and sets at 5h. 59m. P.M.

At this time Uranus will be very near the star Regulus. It will not be easy to see it, as its diurnal passage is almost wholly made during the light part of the twenty-four hours.

Neptune.

Neptune rises on the 1st at 10h. 53m. P.M., and sets at 12h. 23m. P.M. of the next day. On the 31st, Neptune rises at 8h. 55m. P.M., and sets at 10h. 25m. of the next day.

The Visual Purple of the Eye.

We have several times alluded in these columns to the so-called visual purple, or *seh-purpur*, as the German physiologist, Boll, terms it. This visual purple is a colored sheet at the back of the retina of the eye, and becomes impressed by light in the same way as a photographic film. The light must, however, be very intense to make an impression, and it was only by exposing a rabbit's eye in a dark room to the action of a ray of light coming through a shutter for three minutes that any image could be produced.

It has been a question how long the visual purple remains after death. Boll found that a rabbit's eye immediately after death was in a position to receive an image quite as readily as when alive, and he asserted that he believed the visual purple to remain unbleached and photographic many hours after death. The German physiologist has been lately able to prove that in the human being such is the case for two hours and three quarters after death, at any rate. The subject in this case was a criminal who was executed in Vienna on the 5th of March last, at a quarter past seven in the morning. The execution occurred in a badly lighted yard, surrounded by high walls, and immediately after death the executioner, as is customary, closed the eyes of the body. Other means were then taken to keep light from the retina, and after an interval of a couple of hours an examination was made by Boll of the eye. A microscopic inspection at once showed the existence of the visual purple, so that the eye still possessed photographic properties, but no trace of an image was to be observed on the retina of the dead man. But even had a slight impression been bleached upon the purple film, say that of the prison wall, this would, nevertheless, have disappeared again, since the membrane behind the retina possesses all the properties of a re-sensitizer, and would have restored the purple color again in a very short time. That the visual purple does not lose its properties till some time after death may now be taken for granted.

So far as regards the possibility of an image existing on the retina after death, so as to be discovered some hours subsequently, we may safely decide in the negative, judging from what we know of the *seh-purpur*. It is only, as we have seen in the case of the rabbit, where the object is very bright, or it is steadily reflected upon the eye for some time, that an image appears; and then the latter must be immediately fixed in alum, as otherwise the mucous sensitizer does its work, and the purple color is restored. No doubt when the eye looks upon a very light object—the sun, for instance—and the vision remains persistent for some minutes, or seconds, afterwards, our eye has received photographic impression, but this not likely to occur just before death. Only under such circumstances would it appear possible to secure a photograph upon the *seh-purpur*, or visual purple of the eye.—*Photographic News*.

A New Fire Cistern.

A new fire cistern, by Mr. R. T. Scowden, City Engineer, was lately tested at the corner of Thirteenth and Magazine streets, Louisville, Ky., and proved to be entirely satisfactory. This cistern is entirely different from any fire cistern ever used before. It is constructed to hold three hundred barrels of water; the body of the cistern instead of being perpendicular is horizontal, lying parallel with the course of the street, cylindrical in form, the walls being of brick and cement, thirteen inches in thickness. The tank is sixteen feet long and ten feet in diameter, with the crown twenty-four inches below the surface of the street, the two outlets being near the ends. The idea of this plan of cistern is to obtain more than one outlet, which is impossible in those now in use, so that a great number of engines can be operated from one receptacle. Another advantage claimed for it is that the cistern, from the nature of its construction, cannot be crushed in from the street above. Every one who saw the test were much pleased, and were ready to acknowledge the superiority of this cistern over those now in use. It is likely that they will be extensively adopted in the future.

Methylated Spirit.

Methyl alcohol, wood spirit or wood naphtha, is one of the volatile products obtained by the destructive distillation of wood, sawdust, spent dyewoods, etc. It is used in a variety of chemical operations, and in the manufacture and preparation for use of certain artificial coloring matters. It having, fortunately, a very disagreeable taste, it is never used for drinking, and hence it may be manufactured, sold, and employed in the arts without any excise interference.

Methylated spirit, however, is a very different article. It consists of ordinary (so-called *ethylic*) alcohol mixed with about five to ten per cent of the true methyl alcohol just mentioned, and is, therefore, not a definite chemical compound, but a mere mixture. The origin and history of this "methylated spirit" may be briefly stated as follows: Methyl alcohol (wood spirit), though very useful to the chemical manufacturer and color maker, cannot be used as a substitute for common alcohol (spirit of wine), but produces different results. It was also found that many chemical operations which require spirit of wine could not be carried on as cheaply in England as on the Continent, where spirit is much cheaper on account of the smaller duty payable on its manufacture. Government was therefore petitioned to

grant some relief to manufacturers by remitting the duty payable upon alcohol used in the arts. The result was the concoction of the mixture known as "methylated spirit," which was supposed to be undrinkable, and which, under certain conditions, was to be sold duty free to dyers, etc. Unfortunately the mere addition of wood spirit to alcohol did not seem to the authorities a sufficient precaution. Except a manufacturer or dyer was able to give security in £1,000 not to use or allow to be used the "methylated spirit" for drinking purposes, further additions were insisted upon. One of these consists in dissolving in the spirit a small quantity of shellac. This addition was proposed in the interest of the varnish makers, who it was erroneously supposed would be the main consumers of methylated spirit, and to whom the presence of shellac would be no detriment. In this state the spirit is sold under the name of "finish." This addition, for the color maker and dyer, is one of the most unfortunate that could have been devised. It makes all colors come up flatter, and gives reds especially a dull bluish tone. To detect shellac in methylated spirit it is merely necessary to add a spoonful of the suspected sample to a large glass of pure water, say condensed steam water, and stir up well. If shellac is present it will be precipitated, and occasion a white turbidity or milkiness in the liquid. Sometimes instead of shellac a small quantity of some aniline color, blue or red, is added to the spirit. Whatever color is selected will, of course, in certain cases prove objectionable.

We should suggest that if any further addition to the methylated spirit is really needful—which we doubt—something of an intensely nauseous flavor would be much better than colors or resinous substances.

On the Continent ordinary alcohol is cheaper than wood spirit, and hence purchasers of the latter sometimes find it more or less adulterated with the former. To detect this fraud Riche and Bardy heat the suspected sample with sulphuric acid, dilute with water, and distil. They then mix the distillate with peroxide of manganese and sulphuric acid, thus converting the ethylic alcohol into aldehyde, and add a solution of hyposulphite of soda, and finally some magenta. If common alcohol is present, even to the extent of one tenth per cent, the magenta takes a violet color.—*Chemical Review*.

Blasting by Electricity.

Blasting by electricity, one of the latest practical developments of science, is being generally utilized. The advantages are great saving of explosives, safety, and protection of life, economy of capital and time, and overcoming obstacles that nothing else will, such as firing under any quantity of water, sinking or driving in soft sandstone, granite splitting, rooting up trees, blasting slag, etc.

On Saturday, June 16, a gigantic explosion was arranged in the granite quarries of Messrs. Ellis and Evrard, at Bardon Hill, near Leicester, by Messrs. Atkin and John Harris, of Nobel's Explosive Company; six holes being put in, averaging a depth of 20 feet, each hole being charged with 15 lbs. of dynamite, and exploded with Capt. Brain's electric fuses. The machine used to fire them was Capt. Brain's American Improved, a most compact and simple article, being only some 14 lbs. in weight, which may be used by the ordinary working men, giving an electric spark 2 inches in length. The firing of these six holes had a most marvelous effect, the whole quarry having the appearance of being rent as by an earthquake. Huge blocks of granite were tumbled out, and upon careful examination and measurement it was computed that 14,500 tons had been dislodged and thrown into the bottom of the quarry. This practical demonstration of the effect of simultaneous blasting with a powerful explosive in connection with quarry works was most satisfactory to the proprietors and other gentlemen present, it being generally acknowledged that such successful results had never been known in the district before.

The Electric Blasting Apparatus Company, Cinderford, Gloucestershire, have also just very successfully laid down a set of blasting apparatus at South Kirkby Colliery, near Pontefract, where shafts are being sunk to a depth of 700 yards. The advantages of the system are so apparent in collieries already using this apparatus in the district that its use is becoming more general. At the Houghton Main Colliery, near Barnsley, two 15 feet shafts are each firing 16 holes at once, and raising 70 tons of *clébris* from a shot, an increase of 50 tons a blast on the old system—a practical demonstration of the great advantages of simultaneous blasting.—*Mining Journal*.

The English Iron Trade.

The statistics of the iron trade for last year show that out of 4,970,000 tons of pig iron produced in the Cleveland district, 2,828,000 were retained for home consumption, and 2,041,000 tons were exported; and in 1874, 3,543,000 tons of the 5,991,405 produced were retained for home consumption, whilst only 2,587,000 tons were exported. In 1863 the quantity of pig iron made in the North of England was 838,400 tons; last year it reached 2,075,000.

Casualty by Lightning.

The Salem (N. J.) *Standard* states that recently Mr. Henry White, a well-known resident of Lower Penn's Neck, was killed by lightning as he stood in his own doorway. He went to the door to look at the clouds, and as he looked out he placed his hand upon the water conductor, and was instantaneously struck by the electric fluid, which, it is supposed, was at that moment passing down the spout.