

GREAT IMPROVEMENT IN THE ELECTRIC LIGHT.

The following clear statement of a most important discovery which has recently been made by M. Gassiot, in the production of light by electricity, we take from the London *Photographic News*.

A most interesting application of some very elaborate and abstruse researches in physical optics has recently been made by M. Gassiot. It has long been a desideratum to obtain a source of light without heat. Irrespective of the great advantages of such a discovery to the photographer, its value would be almost inestimable in many other branches of science. The surgeon, for instance, has hitherto been compelled to perform many operations—upon which the health, perhaps the life, of his patient depends—almost in the dark; whilst the saving of life which would necessarily follow the introduction of such a safe means of illumination in our coal mines, would be incalculable. M. Gassiot has, we fancy, at last succeeded in solving the problem, and that by an application of some of the most recondite and, to the mere utilitarian, apparently useless, investigations ever commenced by scientific man. It has long been known that, under certain circumstances, the electric discharge from a voltaic battery can be made to traverse short distances across air in the form of an intensely luminous, but at the same time, intensely hot spark. If this discharge is made to pass through a glass tube, by means of platinum wires sealed into the extremities—the air having previously been exhausted from it by means of an air-pump—the discharge assumes an entirely different aspect. Instead of appearing in the form of disconnected sparks, the electric fluid traverses it like a continuous stream of nebulous light, filling the tube with a beautiful phosphorescent glow, whilst the heat almost disappears: on this account it was until very recently, considered that a vacuum conducted electricity. Recent researches have, however shown, that a vacuum really is a non-conductor to the passage of the electric fluid; and that the phenomenon of conduction apparent in the “vacuum tube” was really due to the great conducting power possessed by a highly rarified gas. As soon as this was known, it became a matter of great interest to philosophers to ascertain the various effects which would be produced by having the tubes filled with different sorts of gases, and also what difference was caused by alterations in the size or shape of the vacuum tubes employed. Amongst these experimentalists, M. Gassiot occupied one of the first positions; and, as an adaptation of some of his researches to the wants of every-day life, he has given to the world a ready and simple means of applying the electric discharge from the induction coil to the purposes of illumination. A carbonic and vacuum tube (that is, a tube filled with carbonic acid, which is then exhausted from it by means of an air-pump, until there is only the most infinitesimal trace of gas remaining), having an internal diameter of about 1-16th of an inch, is wound in the form of a flattened spiral; to the ends of the tubes are attached two wider tubes into which platinum wires are sealed: they are inclosed in a wooden case, so as to permit only the spiral to be exposed. When the discharge from a Ruhmkorff's induction apparatus is passed through the vacuum tube, the spiral becomes intensely luminous, exhibiting a brilliant white light. M. Gassiot, who exhibited the instrument in action at a recent meeting of the Royal Society, caused the discharge to pass through two miles of copper wire, showing that it would be applicable to illumination at a distance. The results were brilliant in the extreme; and we confidently predict that this beautiful contribution of abstract science to every-day life will very shortly be one of the most useful and popular forms of the electric light.

SPONTANEOUS COMBUSTION OF SAWDUST.

Messrs. Editors:—An occurrence took place during the night of the 24th ult., in our manufactory that makes it extremely probable that greasy sawdust will ignite spontaneously under suitable circumstances; which in this instance are as follows:—We had, as is usual, used about a bushel of sawdust during the day, in our tempering shop to cleanse the saws after being removed from the oil bath, this operation made the sawdust quite warm and oily, in addition to this it was damp before using, and being left in a compact heap, the result was, that early next morning it was discovered

to be on fire, it was, smouldering in the middle of the pile, and almost half of it consumed.

It is proper to remark that it was not used later than 3 P.M., on the previous afternoon, that it was contained in a shallow box on legs three feet from the floor, and men were at work from three to six hours afterwards in the same shop, but not very near to it. It is almost impossible there could have been any fire between the hours of 3 and 10 P.M., without being discovered.

If you think the above facts would be of interest to your readers make what use you please of them.

My two patents are received from Washington, please accept my thanks for the prompt and satisfactory manner with which you managed them, and without any care or trouble on my part.

WILLIAM CLEMONS.

Middletown, N. Y., September 10, 1860.

[It has long been known that some kinds of oil will absorb oxygen so rapidly, as, under certain circumstances to produce ignition. On page 132 of the current volume will be found a paper on this subject, read before the American Association for the Advancement of Science, at Newport, by Professor Horsford, in which he described an apparatus for testing different kinds of oil in this respect, to prove their comparative safety.

THE FIRST STEAMER THAT CROSSED THE ATLANTIC.

Messrs. Editors:—I shall be obliged if you will inform me in your next publication, what the name of the first steamer was that crossed the Atlantic, where she sailed from, and where she arrived at, with dates, &c.

Columbus, Ga., August 24, 1860.

The first steamship that crossed the Atlantic was the *Savannah*, a ship of 380 tons, built by Crocker & Fickitt, of this city. Her first voyage was from New York to Savannah, whence she sailed direct for Liverpool, arriving at the latter port on the 21st of September, 1819, after a voyage of 18 days, having used steam only 7. She had an inclined engine placed between decks, and side wheels which could be taken from off the shafts. Her fuel was pine wood. On page 35, Vol. X. (old series) *SCIENTIFIC AMERICAN*, will be found a full account of the voyage, from which we take the following extract:—

“The arrival of the *Savannah* at Liverpool appears to have created considerable excitement. As she drew near the city with sails furled, and American banners flying, the docks were lined by thousands of people, who greeted her with vociferous cheers. A Liverpool editor said, ‘Among the arrivals on the 21st, we were peculiarly gratified and astonished by the novel sight of a fine steamship, which came around at half-past seven, without the assistance of a single sheet, in a style which displayed the power and advantage of the application of steam to vessels of the largest size, being 350 tons burden.’”

That a ship of 350 tons should be considered in 1819 a vessel of the largest size, is a very striking proof of the wonderful progress which has been made in the art of shipbuilding in the last 40 years. Vessels of 5,000 tons are now common, and one has been built of more than 20,000 tons.

HARDENING OF GUTTA-PERCHA.

Messrs. Editors:—I wish to know if there is anything that can be mixed with gutta-percha, and that will harden when cold; if you know of any suitable substance I would like the information as soon as possible, and I will pay you what is right.

W. A. B.

Ware, Mass., August 24, 1860.

[Gutta-percha, after being fused in a close vessel, may be “vulcanized” by kneading it with sulphur, then baking it in an oven at a temperature of 300° Fah. Gutta-percha may also be hardened by kneading it when warm, with plaster-of-paris or plumbago; the latter makes a black compound.—Eds.

THE *Journal de Rouen* states that the medical statistics having shown that several cases of loss of limb, and even death, had occurred from the practice of tattooing so common among seamen, the maritime authorities in France have recommended the discontinuance of the practice.

One of the tunnels on the Baltimore and Ohio Railroad is lined throughout with cast iron, and lighted with gas.

A COLUMN OF VARIETIES.

Two centuries ago not one person in a hundred wore stockings.

Refined coal oil is a solvent of gutta-percha and india-rubber.

The farmers on the Merced river bottoms, in California, plant corn on their grain fields, just after harvest, and never fail to reap a successful crop.

The Illinois Central Railroad is furnished with seventeen miles of cars, with the usual proportion of freight cars; but the grain crops of the State are so enormous, the road is incapable of doing all the transportation required of it.

Trains over the Rutland and Washington railroad are considerably impeded in their passage by the myriads of grasshoppers that lodge on the railroad track, and are crushed beneath the giant wheels of the engine. The track is rendered so slippery and greasy by the crushed mass that it is almost impossible for any headway to be made on the up grades.

According to the London *Times*, water impregnated with lead may be made wholesome by means of well-burnt charcoal—animal charcoal—which may be used either in the manner of the whiting recommended by Dr. Faraday, namely, by stirring up the charcoal in the water and allowing it to subside, or by filtering in the water through a vessel containing the charcoal in coarse powder.

A veterinary surgeon of Dundalk, Ireland, of considerable experience, states that sand is not only an excellent substitute for straw as bedding for horses, but that it is, in many ways, superior to it, as the sand does not heat, but saves the hoofs of the horses. He states that sand is exclusively used for bedding in his stable.

At the Temescal tin mines, the Los Angeles *Star* says, further discoveries of tin mines have been made, extending over a space of several miles. Seventeen distinct leads have been reported, thus far. Much excitement prevails there among discoverers, from the fact that parties from San Francisco are surveying the “tin mountains,” to the extent of three leagues, it is said, and covering the same with school-warrants.

The committee of the New Bedford merchants, who have offered premiums amounting to \$4,500 for the best lamps designed for burning whale oil, having been requested to grant further time for the completion of lamps for examination, have accordingly extended the time from August 30, 1860, to and including Oct. 1 next. Jos. Grinnell is chairman, and Matthew Howland, secretary of the committee.

From extensive investigation of the subject, M. Constantine Paul, of Paris, has come to the conclusion that unborn children are frequently poisoned to death by the use of lead water by the mother. His paper giving the histories of 81 cases is deposited in the Archives Générales de Médecine, and we find a condensed *resumé* of the work in the Philadelphia *Medical and Surgical Reporter*, which regards M. Paul's conclusions as fully established.

A gridiron is being prepared at Milford Haven, in England, for the purpose of beaching the *Great Eastern*, in order to clean her bottom. It will cost about \$5,000.

Pieces of hemp rope which have been fished up from the wreck of the *Royal George*, at Spithead, after a century of submergence, have been found perfectly sound, and they are said to have actually retained the smell of the tar.

The Red Sea and most of the Mediterranean telegraph cables have completely given out. There is now no long line of submarine telegraph in operation in the world. The short lines, however, between England and the continent, continue perfect.

The disease termed “mange” in horses, cattle and dogs, and “scab” in sheep, is produced by the ravages of a variety of mite, *Acarus scabiei*, which burrows in the skin of the animal, causing considerable itching and pain, the development of small vesicles and postules with dryness, scurfiness and baldness of the skin. Scabies in sheep is of very common occurrence. The best preventive of scabies, when a visitation of the disease is apprehended, is cleanliness. The occasional washing of the animals with soap and water, and the friction necessarily employed in the detergent process, will do much towards preventing their skin from becoming a suitable place for the *acari*; for these minute animals, like pigs, delight to dwell in dirty localities.