

good deal as to the rapidity and violence of this decomposition; the picrates of mercury, silver and copper on the one hand burning quickly, like loose gunpowder, and on the other, the picrates of calcium, lead, and especially potassium, exploding with a loud detonation when heated on a flat plate, or when sharply struck by a hard body. The first to make practical application of this property of picrate of potassium was Mr. Whitworth, who used the salt to fill shells to be directed against the armor plating of ships. While picric acid may be prepared by the action of nitric acid on many organic substances, such as indigo, aloes, silk, carbolic acid, or salicin, the most convenient and economical material is the so-called "yellow gum," or resin of the *Xanthorrhoea hastilis*, which yields, according to Dr. Stenhouse, about fifty per cent of the crystallized acid. The substance is chiefly used as a yellow dye for silk and wool, and as a means of distinguishing animal from vegetable fibers, the former being colored yellow by it, the latter remaining unchanged. It is employed in the laboratory to distinguish salts of potassium from those of sodium: the picrate of potassium being very sparingly soluble in water, while the picrate of sodium dissolves readily.

Changing Clothing.

Many persons lose life every year by an injudicious change of clothing, and the principles involved need repetition almost every year. If clothing is to be diminished, it should be done in the morning, when first dressing. Additional clothing may be put on at any time.

In Northern States the under garments should not be changed for those less heavy sooner than the middle of May; for even in June a fire is very comfortable sometimes in a New York parlor.

Woolen flannel ought to be worn next the person, by all, during the whole year, but a thinner material may be worn after the first of June.

A blazing fire should be kept in every family room until ten in the morning, and rekindled again an hour before sundown, up to the first week in June and from the first day of October.

Particular and tidy housekeepers, by arranging their fire-places for the summer too early, oftentimes put the whole family to a serious discomfort, and endanger health by exposing them to sit in chilliness for several hours every morning, waiting for the weather to moderate, rather than have the fireplace or grate all blackened up; that is, rather than be put to the trouble of another fixing up for the summer, they expose the children to croup and the old folks to inflammation of the lungs. The old and the young delight in warmth; it is to them the greatest luxury. Half the diseases of humanity would be swept from existence if the human body were kept comfortably warm all the time. The discomfort of cold feet, or of a chilly room, many have experienced to their sorrow; they make the mind peevish and fretful while they expose the body to colds and inflammations which often destroy it in less than a week.—*Hall's Journal of Health.*

Editorial Summary.

THE outcry made some months ago against the abuse of the franking privilege on the part of Members of Congress seemed to put a check upon it for a while, but we have now before us a private business circular of a Washington firm, styled "Swetland & Co.," franked by the written signature of Hon. John T. Deweese, Member of Congress from North Carolina. We call the attention of the Hon. Mr. Deweese and of Postmaster-General Cresswell to this system of sweetening the postal revenue. It's not fair, it's not honest.

IT is announced that the city of Boston was gently rocked in the lap of a tender earthquake on the afternoon of April 23d. The localities affected were Brookline, Hingham, Stoughton, Canton, Dedham, and South Dedham. It occurred at nearly three o'clock with a heavy report and a vibratory sensation, which did not last more than three seconds. The crockery-ware shook in the closets, and the glass in the windows. The weight and duration of the shock was greatest at Dedham.

A MUSEUM of Natural History is to be established in the Central Park, in this city, \$50,000 having already been subscribed for that purpose. The Commissioners of the Park have offered the use of the large hall of the Arsenal Building as a place where the collections may be deposited until a suitable structure can be erected. We understand it is proposed to erect a museum building on Ninth avenue, fronting the block between Seventy-eighth and Seventy-ninth streets.

INVENTORS who have English patents, or would like to introduce their inventions in Great Britain, will find it for their interest to consult a member of an old established firm, who is temporarily stopping in this city. See advertisement on another page.

SOME of our cotemporaries are designating the new Commissioner of Patents as "Judge" Fisher and "General" Fisher, neither of which titles are applicable. Mr. Fisher is a lawyer by profession, and held the position of Colonel of the 138th Ohio Volunteers.

THE manufacture of beet-root sugar was begun in a small way at Oshkosh, Wis., some time ago, and proved so remunerative that an immediate enlargement of the works is contemplated.

COMMISSIONER FISHER has removed Examiners Peters and Barnett. It is likely that other changes will be made.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

STEEL RAILS.—The question of the manufacture of steel rails continues to be a subject of intense interest in the iron districts of England. The *Birmingham Daily Gazette* gives an account of the Siemens-Martin process, which has recently been brought into practice on a manufacturing scale at the North Yorkshire Steel and Iron Works, near Stockton-on-Tees, by Mr. Samuelson. The works were recently put into operation, and on the following day, the first rail was rolled for the Darlington section of the North Eastern Railway Company, with, it is said, perfect success. "The rail placed on bearings 3 feet 6 inches apart, was subjected to the impact of a ball weighing 22 cwt., falling from a height of 30 feet, without showing the slightest flaw, and each subsequent day's product has borne the same extraordinary test." Mr. Siemens himself is erecting similar works in South Wales.

UTILIZATION OF BLAST FURNACE SLAG.—The following method is now adopted in several iron works in Belgium: The slag is allowed to run direct from the furnace into pits about eight or nine feet in diameter at the top, with sides sloping inwards towards the center, where they are about three feet deep. The mass is left for eight or nine days to cool, when a hard compact, crystalline stone is obtained, which is quarried and used for building purposes, but chiefly for paving stones. They appear to wear exceedingly well, being quite equal to the grits and sandstones already so much used.

The Lawrence (Mass.) *American*, gives the number of operatives employed in the manufacturing establishments of that city. The total number is 10,542; 4,558 males and 5,984 females. The Pacific Mills employ 3,687 hands; the Washington, 2,312; Atlantic, 1,150; Everett, 883; Pemberton, 836; Arlington, 199; Duck Mills, 180; Russell Paper Company, 138; Lawrence Woolen Company, 116; Gilmore's Straw Works, 134; Wright Manufacturing Company, 99; Lawrence Worsted Company, 78. The total number of hands employed in the manufacturing establishments of Lowell is 13,827; 4,914 males and 8,913 females.

WISCONSIN WOOLEN MANUFACTURERS' ASSOCIATION.—The Wisconsin woolen manufacturers held their annual meeting at Milwaukee on the 13th of April. The display of samples from some of these mills was very creditable; the Racine shawls and Appleton coeskins, flannels, and cassimeres being especially fine. A committee was appointed to consider the expediency of holding an annual trade sale. The next meeting will be held in Milwaukee, in April, 1870.

A blast furnace for the manufacture of charcoal pig iron is to be established at Frankfort, on the eastern shore of Lake Michigan, by a company recently organized in Detroit, with a capital of \$100,000.

A furniture factory in Hanover street, Boston, employs 500 hands, runs a 100-horse-power engine, and keeps constantly on hand 1,500,000 feet of dry black walnut lumber.

In a few weeks the Rock Island and Pacific railroad will be completed to Council Bluffs, and thus Chicago will have two entirely independent lines to Omaha.

In the lumber yard of the Pacific railroad, at Omaha, are stored four and one-half million feet of lumber, and seven hundred and sixty-eight workmen are employed.

A rolling mill to employ one hundred and fifty hands is about starting at Joliet, Ill.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; beside, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$100 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

S. J. K., of Vt.—No perceptible effect is produced upon a weight suspended from a spring balance during the conjunction of the sun and moon, by their united attraction. It is only upon very large bodies that this cause could produce a perceptible effect, and the effects perceptible in large bodies of water are very slight when compared to their entire bulk. When you consider that the highest mountains are far less in proportion to the entire bulk of the earth than the wrinkles on the rind of an orange are to its bulk, you will see that the highest tidal wave is a very small thing compared to the mass of the earth. The statement that the sun is four millions of miles nearer than was originally computed from the transit of Venus, is based upon more recent calculations made from other data and is now universally admitted by astronomers. Nitroglycerin is made by dropping glycerin into equal parts of strong nitric and sulphuric acids; it is a dangerous plaything. You will find some hypotheses in works on physics, upon the cause of the refraction of light, but nothing positive has been demonstrated as to its ultimate cause.

H. A., of Col.—The cubic foot of water weighs 62½ lbs. and converted into steam of atmospheric pressure would contain for each lb. 537 centigrade units of heat, and for the 62½ lbs., 537x62½ or 33,562 units of heat. A nominal horse power, per hour of 60 minutes, is obtained by the combustion of 2½ lbs. of coal and evaporation of 25 lbs. of water, containing 25x537 or 13,425 units of heat. A nominal horse power per hour is equal to 33,000x60 minutes or 1,980,000 foot lbs. per hour. Dividing 1,980,000 foot lbs. by 13,425 would give us 1,474 foot lbs. as the mechanical equivalent of 1 unit of heat of atmospheric pressure—a portion of heat being lost. This equivalent is however too low by from 20 to 30 per cent.

T. J., of Ill.—"Can two pieces of flat iron be so fitted with a file, that by placing one upon the other—no oil or other substance between—the atmospheric pressure will keep them together." We see no reason why the two pieces cannot be fitted by the file; it is often done by scraping surfaces. We doubt, however, if the surfaces are held in contact by atmospheric pressure alone. Cohesion of particles is probably the source of the force or attraction that holds the two surfaces together.

A. T. C., of N. Y.—Castor oil is unfit for lubricating either gun locks or any other mechanism. It is viscid and "gummy." Better is pure sperm, porpoise, olive, or poppy oil. Don't gum up your gun with it.

G. F. S., of Mass.—If you cannot reach the defect in your steam cylinder to plug it, or melt in a composition, stop the hole with a mixture of two parts sal ammoniac with eight parts fine cast iron filings. No sulphur to be used.

A. T. C., of —To remedy the fault in your blackboard give it a coat of lampblack and japan varnish. The lampblack should be deprived of oil if necessary by heating in the usual way.

H. D. D., of Texas.—Water might without doubt be brought over the neck of land of which you speak in syphons. The distance however, is so great in proportion to the fall, that with your low head, you would get a sluggish flow on account of friction, we do not feel justified in recommending the attempt as a means of getting power.

A. W., of Mo.—The separation of silver from lead is profitably done in many places. The information you seek can be found in Phillip's "Mining and Metallurgy of Gold and Silver," sold by D. Van Nostrand of New York city.

W. S., of Wis.—We have carefully examined your article upon velocity, and it is evident to us that you do not understand the subject. We prefer not to publish crude notions upon abstract scientific subjects.

F. S., of Mich.—The cost of beet root sugar machinery given in our paper is based upon the charges in gold for such machinery in France. The other information that you seek on the subject will be given in the remaining article of the series.

R. M. C. of Iowa.—We cannot undertake to verify the correctness of your analysis of composite numbers. Such investigations require more of our valuable time than we can afford to bestow upon subjects of that character.

H. H., of Berlin.—You mistake our position entirely. We are opposed to all swindling rings, but we do not propose to revive and denounce old swindles that have gone out of sight. Our paper would not be large enough to keep pace with active operations of that kind going on.

J. B. U., of Md.—We did not preserve the letter of the correspondent to which you refer, therefore cannot send his address.

E. R., of N. Y.—Your idea of crossing Broadway by the use of wings or the flying trapeze, is novel, to say the least, but it scarcely merits notice as a practical scheme.

E. P., of N. Y.—We recommend you to write to H. C. Baird, of Philadelphia, for a work on the art of perfumery.

R. H., of Ill.—The law enacted by the legislature of your State, in reference to the sale of patent rights, is intended to put a check upon frauds. It cannot interfere with legitimate sales of patents.

C. F., of Ohio.—Good white lead putty is as good as anything for an aquarium. The water ought to be changed several times however before putting in your fish.

E. E., Ind.—A good varnish to protect tin plate is lacquer, similar to that used for brass, and applied in the same way.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per line will be charged.

Keuffel & Esser's, 71 Nassau st., New York, the best place to get first-class drawing materials.

Wanted—A Salesman who can come well recommended—machinist preferred—to travel on commission for the sale of iron and wood-working machinery, and other articles. Address Manufacturer, care of Theodore Lyon, Newark, N. J.

Stencil goods and dies, E. H. Payn, Payn's Block, Burlington, Vt.

For Sale—European patents for the best fire extinguisher ever invented. Address Postoffice Box 693, Boston, Mass.

Dr. Sheap's Compound Carbolic Acid Vermin Killer destroys Croton and bedbugs, cockroaches, moths, ants, and rats, 127 Bleecker st., New York.

Lewis Bishop, Talladega, Ala., wants a partner to patent an invention.

Second-hand power planer wanted to plane three or four ft. Send description and price to Ross & Martin, Middlebury, Vt.

Patentees or manufacturers of clock-work for summer or fly fans, send address to H. B. Bond, care Fanny H. Watters, Bel Air, Hartford county, Md.

Manufacturers of wrought-iron lap-welded tubing, please address B. Oil City, Pa.

To let, with or without steam power, two well-lighted rooms, suitable for manufacturing. Rent low, 163 Christopher st., New York.

Wanted—A competent electro silver-plater. Address, with reference, Postoffice Box 337, Cincinnati, Ohio.

A complete set of Blanchard Plow-handle Machinery, consisting of lathe, bender with 40 forms, and finishing machine. Has been used but a short time, and is in good order. Address S. N. Brown & Co., Dayton, O.

Builders, and all who contemplate making improvements in buildings, can save time and money by addressing A. J. Bicknell & Co. Publishers, Troy, N. Y., or Springfield, Ill.

Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

For sale at a bargain—a complete barrel factory, nearly new. Address Hartmann, Laist & Co., Cincinnati, Ohio.

Pickering's Velocipede, 144 Greene st., New York.

\$1 per year.—Inventors and Manufacturer's Gazette. The cheapest, best, and most popular journal of the kind published. Send stamp for specimen copy. Saltiel & Co., Publishers, P. O. box 448, or 37 Park Row, New York.

Machine for bending fellies—Patent for sale—the whole, or State Rights. Address DeLyon & Werner, Canton, Miss.

Diamond carbon, formed into wedge or other shapes for pointing and edging tools or cutters for drilling and working stone, etc. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

The new method for lighting street lamps! For illustrated circular, with letter from President Manhattan Gas Light Co., and Sup't of Lamps N. Y. City. Address J. W. Bartlett, Patentee, 569 Broadway, N. Y.

The Tanite Emery Wheel.—For circulars of this superior wheel, address "Tanite Co.," Stroudsburgh, Pa.

The manufacture and introduction of sheet and cast metal small wares is made a specialty by J. H. White, Newark, N. J.

The Magic Comb will color gray hair a permanent black or brown. Sent by mail for \$1.25. Address Wm. Patton, Treasurer Magic Comb Co., Springfield, Mass.

For coppered iron castings address J. H. White, Newark, N. J.

W. J. T.—We think the patent asbestos roofing manufactured by H. W. Johns, of this city, is the best substitute for tin or slate. It cheap and easily applied.

Tempered steel spiral springs. John Chatillon, 91 and 93 Cliff st., New York.

For solid wrought-iron beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Machinists, boiler makers, tanners, and workers of sheet metals read advertisement of Parker's Power Presses.

Mill-stone dressing diamond machine, simple, effective, durable. Also, Glazier's diamonds. John Dickinson, 64 Nassau st., New York.

Water-wheel Patents, Nos. 24,435 and 27,673 for sale. Price \$1,000. The "first" that used an adjustable diaphragm. In wheel and guide R. Ross, Middlebury, Vt.

Mortising Machines—Two second-hand Lane & Bodley hub-mortising machines, wood column. Will be sold cheap. Address S. N. Brown & Co., Dayton, Ohio.

Winans' boiler powder, N. Y., removes and prevents incrustations without injury or foaming; 12 years in use. Beware of imitations.

The paper that meets the eye of all the leading manufacturers throughout the United States—The Boston Bulletin. \$4 00 a year.