

Business and Personal.

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Assays of Ores, Analyses of Minerals, Waters, Commercial Articles, etc. Technical formulae and processes. Laboratory 33 Park Row, N. Y. Fuller & Stillman.

Alcott's Turbine received the Centennial Medal.

Wanted.—Parties to Manufacture my Improved Pipe Coupling on Royalty. Illustrated in Sci. Am. Jan. 26. E. S. Chapell, Pembroke, Maine.

Silver Plater's Sets for Amateurs, \$5. Batteries, Baths, Silver Solution, and Connections. Union Silver Plating Co., Princeton, Ill.

Machinery for Starch Manufacturers wanted. Address Keuffel & Esser, 127 Fulton St., New York.

Telephone Magnets. Electric Supply Co., Box 611, Providence, R. I.

Manufacturers of Self-binding Reapers, send price, etc., to J. B. Reichard, El Monte, Cal.

Wanted.—Tools for Sewing Machine Factory. T. Shanks, Baltimore, Md.

Wanted.—Partner with \$3,000 to \$5,000. Machine and Foundry business; good prospects. 115 Carroll St., South Brooklyn, N. Y.

All kinds of Machine Work, Iron and Brass Castings, at lowest rates. 150 Van Brunt St., South Brooklyn Iron Works, South Brooklyn, N. Y.

For Sale.—One English made Lathe, 28 in. swing, 16 ft. bed, compound rest; price \$150. The Bullard Machine Co., limited, 14 Dey St., N. Y.

For Solid Wrought Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

For book on Lubricants, R. J. Chard, 134 M. Lane, N. Y.

For Sale.—4 H. P. Baxter Engine, second-hand; 5 H. P. Yacht Engine and Boiler; Box 630, Hartford, Conn.

Supplies for Telephone and other Electrical Experiments at manufacturers' prices. Jerome Redding & Co., 30 Hanover St., Boston, Mass.

For Sale.—Machinery and Compositions of all kinds of Matches. Apply to J. H., P. O. Box 942, N. Y. city.

Canadian Patent For Sale.—Mey's Dryer for Grain, Malt, etc., has been in practical use for several years in Buffalo, N. Y. Address F. H. C. Mey, Buffalo, N. Y.

For a 15 in. Swing Lathe having 1 1/2 in. hole through Head Spindle, something new, address Star Tool Company, Providence, R. I.

2 d Hand Iron Planer built by Smith of Salem. Plane 13 ft. x 30 in.; price \$300. A. C. Stebbins, Worcester, Mass.

Cornice Brakes. J. M. Robinson & Co., Cincinnati, O. Noise-quieting Nozzles for Locomotives, Steamboats, etc. T. Shaw, 915 Ridge Ave., Philadelphia, Pa.

John T. Noye & Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour & Co.'s Bolting Cloth. Send for large illustrated catalogue.

Power & Foot Presses, Ferracute Co., Bridgeton, N. J.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay Sts., Brooklyn, N. Y.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon & Co., 470 Grand St., N. Y.

Best Turbine Water Wheel, Alcott's, Mt. Holly, N. J.

Shaw's Mercury Gauges, U. S. Standard of Pressure, 915 Ridge Ave., Philadelphia, Pa.

Vertical Scientific Grain Mills. A. W. Straub & Co., Phila.

Cornless Engine Builders, with Wetherill's improvements, Engineers, Machinists, Iron Founders, and Boiler Makers. Robt. Wetherill & Co., Chester, Pa.

The Niles Tool Works, Hamilton, O., have second-hand Machine Tools in first class order for sale.

Friction Clutches warranted to drive Circular Log Saws direct on the arbor; can be stopped instantly; also Upright Mill Spindles, Safety Elevators, and Hoisting Machinery. D. Frisbie & Co., New Haven, Conn.

Wanted.—Second-hand Gun Stocking, and other Gun Machinery. Address V. A. King, Lock Box 81, New Haven, Conn.

Bound Volumes of the Scientific American.—I have on hand about 200 bound volumes of the Scientific American, which I will sell (singly or together) at \$1 each, to be sent by express. See advertisement on page 123. John Edwards, P. O. Box 773, N. Y.

Vertical & Yacht Engines. N. W. Tyss, New Haven, Ct.

Having dissolved partnership July 1, 1877, we have still on hand and for sale a very large amount of new and 2d hand machines. See our notice on page 93. Step-toe, McFarlan & Co., Cincinnati, Ohio.

The Turbine Wheel made by Rison & Co., Mt. Holly, N. J., gave the best results at Centennial test.

Hand Fire Engines, Lift and Force Pumps for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., U. S. A.

Fine Taps and Dies for Jewelers', Dentists', and Machinists' use, in cases. Pratt & Whitney, Hartford, Ct.

Weldless Cold-drawn Steel Boiler and Hydraulic Tubes. Leng & Ogden, 212 Pearl St., N. Y.

Silver Solder and small Tubing. John Holland, Cincinnati, Manufacturer of Gold Pens and Pencil Cases.

Electrical Goods of every description, Annunciators, Bells, Batteries, Wire, Electro-plating Apparatus, etc. Finger, Risteen & Co., Melrose, Mass.

Machine Diamonds, J. Dickinson, 64 Nassau St., N. Y.

Patent Scroll and Band Saws. Best and cheapest in use. Cordesman, Egan & Co., Cincinnati, O.

Chester Steel Castings Co. make castings for heavy gearing, and Hydraulic Cylinders where great strength is required. See their advertisement, page 128.

For Boulit's Paneling, Moulding, and Dovetailing Machine, and other wood-working machinery, address B. C. Machinery Co., Battle Creek, Mich.

Blake's Belt Studs are stronger, cheaper, and more durable than any fastening for Rubber and Leather Belts. Baxter's Adjustable Wrenches fit peculiar corners. Manuf. by Greene, Tweed & Co., 18 Park Place, N. Y.

Wanted.—A situation as an apprentice in a Steam Engine Manufactory by a young man who wishes to become a steamboiler engineer. Good references. Address Mackay Munro, Wilmot, N. S.

Wanted immediately.—A man to manufacture and sell Norton's Complete Flexible and Detachable Harrow in the United States, also to take out foreign patents. Address Lyman Norton, Hartford, Washington Co., N. Y.

Wanted.—A strictly reliable Manufacturing Company to take charge of manufacture and sale of Lempert's Faucet—see Scientific American of Dec. 8, 1877—or purchaser for Patent Rights. W. S. Lempert, Fort Davis, Texas.

Wanted.—Second-hand Ice Machine, system Carré, of about a thousand pounds capacity in 24 hours. Address, giving price, H. A. S., Box 6, San Antonio, Texas.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

NEW BOOKS AND PUBLICATIONS.

OUR MERCHANT MARINE. By Chas. S. Hill. Third Edition, revised. D. Appleton & Co., publishers, 549 and 551 Broadway, New York.

The writer of this little work aims to show the policy of our government as to internal improvements, compared with the neglect to ocean service; the policy of other nations as to their merchant marine; and lastly what we have lost to our commerce and how to repair our condition. A large amount of statistics and many forcible arguments are adduced in support of his views.

JOURNAL OF THE SOCIETY OF TELEGRAPH ENGINEERS. Nos. 15 to 19, inclusive. E. & F. N. Spon, publishers, 446 Broome St., New York.

The above numbers of the journal contain the proceedings of the society named from April 26, 1876, to May 9, 1877, besides a large number of valuable original communications. The principal papers included are those by Mr. Latimer Clark on Clamons's Thermo-Electric Battery, Mr. Roberts on Batteries, Mr. Risch on Double Current Translation, Herr Treuenfeld on Fire Telegraph, and Mr. Preece on Shunts. These papers are well illustrated and are exhaustive as to their subjects, while embodying the latest results of investigation.

GRUNDRISS EINER PHILOSOPHIE DER TECHNIK. Von Ernst Kapp. Braunschweig (Brunswick), 1877.

"That many subjects of an empirical nature have of late been treated in a philosophical manner is a pleasing proof," says the author, "that empiricism and speculation need to be supplemented one by the other." To supply just such a need existing in that branch of technology known as "mechanics" Dr. Kapp has written the present work. Believing that man, by the work of his hands, has translated the unknown forms, the hidden functions, and the normal proportions of his bodily members, it has been the author's aim to show in these pages the state of mechanism arrived at by following organic models as well as an understanding of the human organism by means of mechanical contrivances, as the only way possible of obtaining a knowledge of the "limits of human activity." It would be impossible in a short notice like this to follow, step by step (or even outline), the arguments by which the author reaches his conclusions, and we must therefore be content to simply call the attention of our readers to this book as an important contribution to German scientific literature, which we hope some enterprising publisher will put forth in an English dress, so that every one interested in such subjects may enjoy it.

A DIGEST OF THE LAW OF TRADEMARKS. By Chas. E. Coddington, Counselor-at-Law. Ward & Peloubet, publishers, New York City.

This volume contains a digest of all the reported and a few of the unreported adjudications in the courts of the United States, Great Britain, Ireland, and Canada, and of the principal decisions in the courts of France; the treaties between the United States and Foreign Countries; the statutes of the United States concerning trademarks, and the rules and forms of the United States Patent Office for their registration. The volume supplies a long felt deficiency, and will prove of much value to the legal profession.

THE APPLICATION OF ELECTRICITY TO RAILWAY WORKING. By William Edward Langdon. Macmillan & Co., publishers, New York City. Price \$1.75.

The object of this work, says its author, is to set before each and all alike not merely the uses to which electricity may be applied in the advancement and for the protection of railway traffic, but also the rules and principles which should regulate its practice. The volume is divided into three divisions, namely, speaking telegraphs, block signaling, and miscellaneous applications. Under the first heading are chapters on signaling instruments and regulations governing their use, single line working and supervision and circuit arrangement. The various systems of block signaling are taken up in turn, the information being carried down to the latest dates, and finally, under the last heading above noted, are considered signal repeaters, interlocking levers, bells, indicators, and train intercommunication. The author writes clearly, explaining with much care and perhaps with even more detail in elementary matters than might be looked for. There is a profusion of engravings and an appendix of forms, relating, however, to English practice.

Messrs. N. W. Ayer & Son, advertising agents, of Philadelphia, Pa., issue a manual containing carefully prepared lists of leading daily, weekly, and monthly papers, and a large amount of information valuable to advertisers and business men.

Annales des Ponts et Chaussées, Paris. December, 1877.

The December number of this publication, just received, in no respect falls short of its predecessors in the value of its contents to the engineering profession.

The Mémoires contained in the present number are: No. 66, calculations of the strength of metallic girders supporting road-bridges; No. 67, on the conditions regulating the establishment of railways for small traffic; No. 68, report of the committee appointed to pass opinion on a new process for purifying the sewage waters of Reims; No. 69, on canals. The latter half of the publication is devoted to new laws and legal decisions that are of interest mainly to French engineers.

ECONOMIC MONOGRAPHS. G. P. Putnam's Sons, 1878. No. II. The Silver Question, by David A. Wells. No. III. The Tariff Question, by Horace White.

The able views held by these two distinguished authors, being well known to the public, need not be repeated here. These little monographs are a model of typographical neatness, and are put forth in a very convenient form for reference.

Rivista Europea—Rivista Internazionale. Florence (Italy), January, 1878.

The present number of this able Italian review contains, as its initial article, one of especial interest to scientists, entitled the "Trial of Galileo Galilei." The remainder of the periodical is devoted to literature and European politics.

The Princeton Review. January, 1878.

The present number of this review makes its appearance with the following table of contents: Divine Retribution; The Church and Civil Law, in Scotland and America; the Eastern Problem; Catholic Elements in Presbyterianism; Christian Theology in its vital form and positive Attitude; Genuineness of the Pentateuch; Evolutionism respecting Man, and the Bible; Conditions of Successful Prayer; Contemporary Philosophy—Historical; Materialism and the Pulpit; Casuistry—Theological and Legal. In the article on "Evolutionism respecting Man, and the Bible," Dr. Duffield in a temperate manner discusses the question: "Is evolutionism, as it respects man, consistent with the Bible?" Taking issue with the eminent scientists, both Romanists and Protestants, who maintain that in evolutionism there is nothing hostile to the system of truth revealed in the Scriptures, he discusses the subject in all its bearings and deduces the conclusion that "it is not only inconsistent with the Scriptures as to man's origin, the nature of sin, and man's original and present spiritual condition; its teaching as to the future of the human race is alike irreconcilable with the teaching of the Scriptures as to the way of man's salvation, its nature, and man's destiny." In concluding his remarks he makes the following disposition of those who differ in opinion with him on this subject: "If the development theory of the origin of man shall in a little while take its place—as doubtless it will—with other exploded scientific speculations, then they who accept it with its proper logical consequences will, in the life to come, have their portion with those who, in this life, 'know not God and obey not the gospel of His Son.'"

Notes & Queries

(1) B. A. W. asks: 1. What thickness of lead and copper plate, and what sizes, will be required in a small battery (for silver and nickel plating)? A. The lead plate may be 1/8 inch or less in thickness; copper, 1/4 inch or less. Use three cells, exposing about 200 square inches surface of zinc; plates about six inches square will answer. 2. Will common bar lead, melted and moulded, and stove zinc answer? A. Yes.

(2) M. S. asks: How can I make glass and tin adhere firmly together, so as to hold oil without leaking after awhile? Oil will work through almost anything. I have tried plaster of Paris, a number of cements and other mixtures, but without success. A. Try the following: Soak isinglass in water till it is quite soft; then dissolve it in the smallest possible quantity of proof spirit over a hot water bath; in 2 ozs. of this dissolve 10 grains of gum ammoniacum, and while still liquid add half a drachm of mastic dissolved in 3 drachms of rectified spirit; stir well together and use warm. 2. Add softened gelatin to about one half its weight of hot glycerin. 3. Gum shellac dissolved in a concentrated hot aqueous solution of borax; concentrate by evaporation. 4. Slake caustic lime with a little boiling water, beat it into a paste with white of egg or blood, and use immediately. Paper pulp may be added to the first three cements.

(3) W. C. A. writes: 1. Can you give some simple process of preparing the inside of oak casks, so that they will not color white liquor—spirits or gin? A. Gelatin or fine glue solution has been used for the purpose. 2. Spirits spilled on oiled or varnished furniture leave a milk-like stain. What will take it out? A. Rub with a little moist tripoli on chamois skin, and then with a drop of oil.

(4) F. W. S. asks: 1. What are rum, brandy, and whisky made from, and how? A. Rum is the spirit obtained by distillation from the fermented skimmings of the sugar boilers, molasses, the juice of the sugar cane, etc. Whisky is nominally the dilute spirits obtained from the distillation of fermented wort of malt or grains, potatoes, etc. Pure brandy is the spirit obtained from the distillation of wines. 2. How are herb extracts made? A. Extracts are usually obtained by heating or boiling the substances repeatedly with water (in some cases with dilute spirit) and rapidly evaporating down the several liquors obtained (after allowing to stand a few hours and straining through flannel) over a water or steam bath. See p. 286, Cooley's "Cyclopaedia of Receipts and Processes."

How can blades cut out of iron be tempered to fine steel, so as to take and retain good cutting edge? A. If soft, by packing in a tight earthen box with fine charcoal, made into a thick paste with molasses, and exposing to a dull red heat for a week, re-heating, rolling, and quenching in cold water.

What chemical will rapidly destroy wood? A. A mixture of potassium chlorate and nitric acid, or of chromic acid and oil of vitriol.

What will eradicate the taint of coal oil from pewter,

tin, or other metallic vessels? A. Hot soap and water; naphtha; carbon disulphide.

(5) E. E. M. asks how the musical tones are produced by common glass tumblers partly filled with water? A. By striking their rims with a little mallet or hammer, well padded with chamois leather; or by drawing a well rosined bow over their rims. A sufficient quantity of water is poured in each glass to give it the desired tone.

(6) C. E. H. asks whether there is any accepted standard pitch of screw threads for general brass-fitting work, such as glass gauge fittings, marine cocks, etc.? A. For brass nozzles, pipe couplings, and faucets there is. For general brasswork the thread pitch is finer than for iron or steel work.

(7) C. A. T. writes: 1. I have a helix 8 inches long, containing 200 feet of No. 18 wire. What size and length of wire shall I use for the secondary coil? A. Use 1 lb. of No. 40 copper wire—silk insulation. 2. Whose battery will give the greatest shock? A. Daniell's—use two cells. 3. Does a secondary coil weaken the power of the helix for making permanent magnets? A. Yes. 4. I made a porous cup of white pine wood, 3/8 inch thick. It was a failure. Why? A. It opposed too much resistance to the passage of the electric current through the solutions of the battery.

(8) H. H. asks: Will paper macerated with nitric and sulphuric acids explode like gun cotton? A. Good unglazed paper, exposed for a few minutes to the action of a mixture of about equal parts fuming nitric and sulphuric acids, thoroughly washed in water made slightly alkaline with soda, and dried, has the composition and properties of gun cotton.

(9) J. O. K. P. asks: Can you give me recipes for colored fires, such as used for theatrical purposes, which will not emit noxious fumes? A. The powerful light from large oxyhydrogen lamps (calcium light), colored by the interposition of suitably stained glasses or gelatin films, is now generally substituted, and gives much better results.

(10) J. W. asks for a recipe for a waterproof dressing for leather or dry hides? A. Add to a boiling solution of common yellow soap, in water, solution of alum or alum cake (sulphate of alumina) as long as a separation of white alumina soap takes place; allow the precipitate to subside, wash it with hot water, heat moderately for some time to expel adhering water, and dissolve the semi-transparent mass in warm oil of turpentine. The solution may be applied by brush or by dipping and rolling. Oil and colors may be added to the bath and the substance dried in the air, or more rapidly in a drying room at 90° to 100° Fah., with care to prevent fire.

(11) E. L. R. writes: I have constructed one of Hill's gravity batteries, and it is imperfect. I get about as strong a current from one cell as from twelve. The zinc is from the ends of matting, and the hangers of brass 1/2 inch wide, 1/4 inch thick, No. 16 gauge, insulated with a thin coat of gutta percha. The battery is charged with 1/2 lb. sulphate of zinc and 1/2 lb. sulphate of copper to half a gallon of water. With a soft iron magnet one cell produces a current strong enough to hold 3 3/4 lbs., and the twelve cells are only able to sustain about 4 lbs. Where is the trouble? A. It is very likely that your zincs contain lead, and as this will cause local action, and interfere with the current of electricity produced by the battery, it would be advisable to procure new zincs. It is also possible that the wire that is wound on your electro-magnet is too coarse, and therefore has too little resistance for an intense current, such as is produced by a number of cells.

(12) J. M. G. asks: Is there a chemical process known by which the spectrum of a burned flower may be "raised from its ashes"? A. Moisten the ashes with a little pure hydrochloric acid and glycerin, gather a little on the loop of a thin platinum wire and expose it to the hottest part of the flame of an alcohol or Bunsen gas lamp, at the same instant viewing the flame through a good spectroscope.

Is there a cement by which a piece of ivory can be cemented to brass or steel? A. Melt together equal parts of good pitch and gutta percha; use hot.

(13) H. S. writes: Can you give me a recipe for making hair dye such as is used in barber shops? Also, a wash or solution which is used before and after dyeing the hair, mustache, and beard, and directions how to use it? A. Cleanse the hair with dilute ammonia water. Then moisten it uniformly with dilute solution of gallic acid or ammonium sulphide, and go over it with a comb moistened with solution of one part nitrate of silver in nine parts of water, touching the scalp as little as possible. Stains may be removed by applying a little dilute solution of iodine in iodide of potassium dissolved in water, and then with solution of sodium hyposulphite.

(14) H. E. E. says, in reply to W. B. H., who asks for the best process for tempering mainsprings for gun locks, and for best steel for that purpose: I have obtained best results with fine cast steel, being careful not to heat above a dull red in hammering as well as in hardening; quench in lukewarm water, then smoke the spring in the blaze of a lamp or resinous wood until it is very black, and heat gently until the soot burns off.

(15) A. J. asks: How long does it take a signal to pass from America to Europe by marine telegraph? A. About 1/4 of a second.

Was the paper money issued by the Continental Congress ever redeemed? A. No. In 1781 the depreciation was in the ratio of 200 and 500 to 1, and in that year all former tender acts were repealed.

(16) J. D. R. writes: I have read that the Continental Telegraph Company were about to use a combination of the Morse instrument and the telephone. Is such a combination possible? A. The combination refers to the use of the two systems of communication, not to a combination of the two instruments.

(17) G. W. R. asks: 1. Is the Atlantic cable laid in pipe through the ocean? A. No. 2. If not, how is it laid? A. It is protected by an armor of heavy