

Business and Personal.

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Special Students in Technical Chemistry, Analysis, and Assaying. Apply to Prof. Leeds, laboratory of the Stevens Institute of Technology, Hoboken, N. J.

Graining Tools. Catalogue. J. J. Callow, Cleveland, O.

For Sale.—Injector Blower, pat. July 31, 1883. Model and information at office of Robert Jackson, 5 Beekman Street, New York.

For Freight and Passenger Elevators send to L. S. Graves & Son, Rochester, N. Y.

Magic Lanterns and Stereopticons of all kinds and prices. Views illustrating every subject for public exhibitions, Sunday schools, colleges, and home entertainment. 116 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., New York.

Microscopes, Microscopic Mounting Instruments, and Materials. Send for catalogue. Queen & Co., Phila.

Steam Pipe and Boiler Covering, Roofing Paints, Prepared Roofing, and general line of Asbestos materials. Phil Carey & Co., 127 Central Avenue, Cincinnati, O.

For Sale.—Steel Fig's., \$1. S. M. York, Cleveland, O. Lightning Screw Plates, Labor-saving Tools, p. 172.

25' Lathes of the best design. Calvin Carr's Cornice Machinery. G. A. Ohl & Co., East Newark, N. J.

Brush Electric Arc Lights and Storage Batteries. Twenty thousand Arc Lights already sold. Our largest machine gives 65 Arc Lights with 35 horse power. Our Storage Battery is the only practical one in the market. Brush Electric Co., Cleveland, O.

Best Squaring Shears, Tinners', and Cannery Tools at Niagara Stamping and Tool Company, Buffalo, N. Y.

Lathes 14 in. swing, with and without back gears and screw. J. Birkenhead, Mansfield, Mass.

The Best.—The Dueber Watch Case.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent Agency, 261 Broadway, New York.

Guid & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Lists 29, 30 & 31, describing 4,000 new and old machines, ready for distribution. State just what machines wanted. Forsaith & Co., Manchester, N. H., & N. Y. city.

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

"Abbe" Bolt Forging Machines and "Palmer" Power Hammers a specialty. Forsaith & Co., Manchester, N. H.

Railway and Machine Shop Equipment. Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

"How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 84 John St., New York.

Wanted.—Patented articles or machinery to make and introduce. Gaynor & Fitzgerald, New Haven, Conn.

Stereopticons and Views for public and private exhibitions. Send for catalogue. Queen & Co., Phila.

Water purified for all purposes, from household supplies to those of largest cities, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St., Newark, N. J.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill.

Ice Making Machines and Machines for Cooling Breweries, etc. Picotet Artificial Ice Co. (Limited), 142 Greenwich Street, P. O. Box 3083, New York city.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Machinery for Light Manufacturing, on hand and built to order. R. E. Garvin & Co., 139 Center St., N. Y.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Vocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Improved Skinner Portable Engines. Erie, Pa.

Fossil Meal Composition, the leading non-conducting covering for boilers, pipes, etc. See adv., p. 205.

Curtis Pressure Regulator and Steam Trap. See p. 142.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 140.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 142.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 157.

The Sweetland Chuck. See illus. adv., p. 174.

Steam Pumps. See adv. Smith, Vaile & Co., p. 172.

Sets of Test Lenses and instruments for oculists. Send for catalogue. Queen & Co., Philadelphia.

Am. Twist Drill Co., Meredith, N. H., make Pat. Chuck Jaws, Emery Wheels, Grinders, automatic Knife Grinders, American Fruit Drier. Free Pamphlet. See ad., p. 190.

Drop Forgings. Billings & Spencer Co. See adv., p. 189.

Brass & Copper in sheets, wire & blanks. See ad. p. 189.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa. can prove by 20,000 Crank Shafts and 15,000 Gear Wheels now in use, the superiority of their Castings over all others. Circular and price list free.

Millstone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau street, New York.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Gear Wheels for Models (list free); Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 190. Hollar's Safe and Lock Co., York, Pa., manufacturers of improved Fire and Burglar-proof Safes. Bank and Safe Deposit Vaults and Locks. See adv. p. 190.

Our goods rank first for quality, safety, and durability. Please compare them with any other make, and is not found better and cheaper, quality considered, we will bear the expenses of the trial. Lehigh Valley Emery Wheel Co., Lehigh, Pa.

Drop Hammers, Power Shears, Punching Presses, Die Sinkers. The Pratt & Whitney Co., Hartford, Conn.

Catechism of the Locomotive. 625 pages. 250 engravings. Most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for catalogue of railroad books. The Railroad Gazette, 73 Eway, N. Y.

Catalogues free.—Scientific Books, 100 pages; Electrical Books, 14 pages. E. & F. N. Spon, 5 Murray St., N. Y. Straight Line Engine Co., Syracuse, N. Y. See p. 188.

NEW BOOKS AND PUBLICATIONS.

THE FORTIFICATIONS OF TO-DAY. By Colonel John Newton, of the Corps of Engineers, U. S. A., and President of the Board of Engineers for Fortifications. Translated from German and Italian sources.

This series of papers consists of three divisions illustrated by charts. It is intended as a treatise on artillery practice applicable to seacoast defense. The treatise—which may be considered as a manual—comprehends the fire against batteries, horizontal and curved fires from guns, served either from fixed points, as a fort or battery on land, or from movable positions, as a vessel at sea, or subjected to the erratic movements of the swell or tide; and the best methods of repelling attacks on fortified or defensive positions, as a vessel at sea, or subjected to the erratic movements of the swell or tide, and the best methods of repelling attacks on fortified or defensive positions made either by sea or by land.

MUSTER ALTITALIENISCHER LEINENSTICKEREI (DESIGNS AND PATTERNS OF OLD ITALIAN CROSS STITCH EMBROIDERY ON LINEN). 1st and 2d Collections. By Freida Lipperheide. Published by Franz Lipperheide, Berlin, 1881 and 1883.

The authoress of this work has made a very careful collection of designs of old Italian cross stitch embroidery on linen, and has also provided her work with descriptions and illustrations of the frames to be used in making the embroidery, and with a full and detailed description of the manner of making the stitches. Most of the stitches are illustrated on an enlarged scale, which is a very great help to those who wish to acquire the art of making cross stitch embroidery. She has also given designs for curtains, portieres, lambrequins, napkins, aprons, table cloths, ties, bed covers, and canopies ornamented with cross stitch embroidery. The first volume contains thirty steel plates of designs, which are beautifully executed, and show the designs in such a perfect manner as to greatly facilitate copying them on linen. The second volume, which was published two years later than the first, also contains elaborate descriptions and illustrations of the stitches, and of portieres, ties, etc., ornamented with the same. The second volume contains thirty steel plates of designs of the same execution as those contained in the first volume. The entire work is finished in an excellent manner, the binding, printing, engraving, and general arrangement being perfect in all respects.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) R. T. asks how to build a furnace for melting brass for small moulds. A small furnace that will melt five or six pounds of brass may be made upon the forge hearth in this wise: Build around the tuyere a chamber or box of fire brick about 10 inches diameter inside and 14 inches high above the tuyere; bank up around the outside with sand to keep the fire in (you will need no mortar). Use charcoal for fuel. A blacklead crucible 6 inches high and 4 inches in diameter at the top will hold 5 or 6 pounds metal without danger of spilling. Build a fire as you would for forging, fill the chamber nearly full of charcoal, set the crucible on top with the metal in it, fill in around the crucible as it settles down. Blow the fire slowly at first; as the crucible settles down even with the top of the chamber, place some fire bricks so as to draw in the top of the fire. A little care and judgment with one or two trials ought to give you a fair understanding as to the management of the crucible. If you use old brass you will get along easily. If you make new brass, you

will find that the melting of the copper will test your ability to produce a hot fire, yet it can be done. We recommend you get "Overman's Moulder's and Founder's Pocket Guide," \$2.00.

(2) A. C. S. asks: What would be the minimum daily expense of running a 50 foot steam yacht, also the number of men required to properly manage the same? A. Can be run with an engineer, pilot, and one deck hand; their cost you can compute from wages paid. You would probably burn 2,000 to 2,500 pounds coal per day of ten or twelve hours. Add say 25 or 30 cents per day for oil, waste, etc.

(3) J. C. asks: What effect will rock salt in solution, that has been used in salting hides, have on vitrified drain pipe? A party claims that it will destroy the vitrification, that it will crystallize in the pipe and render it porous and rotten. The writer has been told that rock salt used as above has passed through 18 inches brick wall, 6 inches cement and 15 inches party wall, and that nothing but glass is safe against it. A. Rock salt will have no effect whatever upon a well vitrified pipe, but it will permeate very readily a poorly glazed pipe, and will effectually spoil it. Brick being very porous, the slightest fault in the cement would enable the solution to saturate the wall and crystallize therein as mentioned.

(4) T. M. C. writes: In springs of the shape of watch springs is the method of obtaining the efficiency of such merely experimental? If not, what is it? What should the best and strongest springs be made of? A. The efficiency of watch and other similar springs is at first found by experiment, in which the thickness, width, and length are taken into consideration. The different grades of steel and the degrees of tempering are variable, leaving no exact gauge in the manufacture. The only proper material for working springs is steel, of the kind sold as spring steel.

(5) F. W. Bacon, Boston, Mass., sends us a practical receipt for gluing leather to iron. Paint the iron with some kind of lead color, say white lead, and lampblack. When dry cover with a cement made as follows: Take the best glue, soak it in cold water till soft, then dissolve it in vinegar with a moderate heat, then add one third of its bulk of white pine turpentine, thoroughly mix, and by means of the vinegar make it of the proper consistence to be spread with a brush, and apply it while hot; draw the leather on quickly and press it tightly in place. If a pulley, draw the leather around as tightly as possible, lap, and clamp.

(6) M. E. A. asks how to construct a dialytic telescope 6 or 8 inches diameter and 6 or 8 feet focal distance. Please state the kind of object glass and the size of the correcting lenses. How far they are to be placed from the object glass, what their focal distance is to be, etc. A. For a dialytic telescope of from 6 to 7 feet focus use a plano-convex crown glass lens 6 inches diameter, 35 inch focus, plane side next the eye, for the object glass. A plane concave flint glass lens 3 3/4 inches diameter, 27 inch focus. Concave side next the eye and at a distance of about 17 inches from the object glass, varying the distance for a final correction.

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