

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

The Universal Calculator.—A novel labor-saving machine for solving questions in arithmetic and mensuration without mental labor. The most tedious problems solved in less than half a minute. Invaluable to engineers, mechanics, and business men. Sent free for \$1. Send for circular. Address W. H. Wythe, Red Bank, N. J.

NAVAL CONSTRUCTOR'S OFFICE, NAVY YARD, NEW YORK, December 9, 1880.

SIR: I would respectfully report that the two boilers . . . have been covered with H. W. Johns' Asbestos Non-conducting Covering; the work has been done thoroughly and satisfactorily. Since completion of the work there has been a saving of coal of about thirty per cent. (Signed) GEORGE R. BRUSH, Naval Constructor.

H. W. Johns Mfg Co., 87 Maiden Lane, N. Y., Manufacturers of Asbestos Paints, Roofing, Boiler Coverings, Steam Packing, Sheathing, etc.

Garmore's Artificial Ear Drums, an appliance for the relief of partial or entire deafness, invented by one who has been deaf thirty years. Simple and scientific in construction, and not observable when in use. Send for circular. Jno. Garmore, S. W. Cor. 5th and Race Sts., Cincinnati, Ohio.

Patent Wanted.—I want to buy whole or part interest, or manufacture on royalty. Address H. C. Lyon, New York.

Lehigh Valley Emery Wheels, made at Lehigh, Pa., are free cutting, durable, and reliable. Every wheel guaranteed to do the work it is ordered for. See adv. on page 450.

For Machinists and Apprentices.—The Student's Illustrated Guide to Practical Drafting. Sent on receipt of \$1. T. P. Pemberton, 142 Greenwich St. P. O. Box 3083, N. Y.

Manufacturers, Steam Boiler Owners, Towns and Cities desiring pure water, send for circular to the Newark Filtering Co., Newark, N. J.

For Sale Cheap—6 Lathes, 2 Planers, 5 Upright Drills, 1 Fowler Press. All on hand. York & Smith, Cleveland, O.

Malleable and Gray Iron Castings to order, by Capital City Malleable Iron Co., Albany, N. Y.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil.

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

For Belt Studs, Belt Hooks, Belt Couplers, Belt Punches, Baxter Wrenches, write Greene, Tweed & Co., N. Y.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Send for Pamphlet of Compilation of Tests of Turbine Water Wheels. Barber, Keiser & Co., Allentown, Pa.

List of Machinists in United States and Canada, just compiled; price, \$10. A. C. Farley & Co., Philadelphia.

Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J.

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

Telegraphic, Electrical, and Telephone Supplies, Telegraph Instruments, Electric Bells, Batteries, Magnets, Wires, Carbons, Zincs, and Electrical Materials of every description. Illustrated catalogue and price list, 72 pages, free to any address. J. H. Bunnell & Co., 112 Liberty St., N. Y.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

Abbe Bolt Forging Machines and Palmer Power Hammer a specialty. S. C. Forsyth & Co., Manchester, N. H.

The Sweetland Chuck. See illus. adv., p. 450.

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of sixty-four pages, published by Jas. F. Hotchkiss, 84 John St., New York, mailed free to any address.

Cope & Maxwell Mfg Co.'s Pump adv., page 398.

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. Skinner's Chuck. Universal, and Eccentric. See p. 449.

Punching Presses & Shears for Metal-workers, Power Drill Presses, all sizes. Power and Foot Lathes. Low Prices. Peerless Punch & Shear Co., 115 S. Liberty St., N. Y.

Pure Oak Leather Belting. C. W. Army & Son, Manufacturers, Philadelphia. Correspondence solicited.

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

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

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

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd & Son, Pittsburg, Pa.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

Improved Skinner Portable Engines. Erie, Pa.

Learn Telegraphy. Outfit complete, \$4.50. Catalogue free. J. H. Bunnell & Co., 112 Liberty St., N. Y.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's adv. p. 413.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 413.

For Leather, Rubber, or Cotton Belting, Linen Hose or Rubber Hose, write Greene, Tweed & Co., N. Y.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 412.

Safety Boilers. See Harrison Boiler Works adv., p. 412.

Ajax Metals for Locomotive Boxes, Journal Bearings, etc. Sold in ingots or castings. See adv., p. 449.

Draughtsman's Sensitive Paper, T. H. McCollin, Phila., Pa.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

50,000 Sawyers wanted. Your full address for Emerson's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa.

List 27.—Description of 3,000 new and second-hand Machines, now ready for distribution. Send stamp for same. S. C. Forsyth & Co., Manchester, N. H., and N. Y. city. For the best Diamond Drill Machines, address M. C. Bullock, 80 to 88 Market St., Chicago, Ill.

Silica Paints (not mixed); all shades, 40 Bleecker St., N. Y. Pays well on small investment.—Stereopticons, Magic Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday schools, and home amusement. 116 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., N. Y. Centrifugal Pumps, 100 to 35,000 gals. per min. See p. 13.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J. Barrel, Key, Hoghead, Stave Mach'y. See adv. p. 14.

Metallic Letters and Figures to put on Foundry Patterns, all sizes. H. W. Knight, Seneca Falls, N. Y.

Eagle Anvils, 10 cents per pound. Fully warranted.

Peerless Colors for Mortar. French, Richards & Co., 410 Callowhill St., Philadelphia, Pa.

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

Gould & Eberhardt's Machinists' Tools. See adv., p. 13.

Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. L. S. Graves & Son, Rochester, N. Y.

The Medart Pat. Wrought Rim Pulley. See adv., p. 14.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 14.

See Bentel, Margedant & Co.'s adv., page 14.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blin Machinery, send for catalogue to Rowley & Hermance, Williamsport, Pa.

Diamond Planers. J. Dickinson, 64 Nassau St., N. Y.

Cutters for Teeth of Gear Wheels formed entirely by machinery. The Pratt & Whitney Co. Hartford, Conn.

Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 12.

The Twin Rotary Pump. See adv., p. 413.

Common Sense Dry Kiln. Adapted to drying all of material where kiln, etc., drying houses are used. See p. 13.

The Porter-Allen High Speed Steam Engine. Southwork Foundry & Mach. Co., 430 Washington Av., Phila. P.

Telegraph, Telephone, Elec. Light Supplies. See p. 13.

The only economical and practical Gas Engine in the market is the new "Otto" Silent built by Schleicher, Schumm & Co., Philadelphia, Pa. Send for circular.

4 to 40 H. P. Steam Engines. See adv. p. 382.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 13. Totten & Co., Pittsburg.

Portable Power Drills. See Stow Shaft adv., p. 13.

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 this 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) A. A. E. asks: Can you tell us how so-called "photo-stereotypes" are prepared? A. A sheet of ordinary plate glass larger than the picture to be reproduced is coated in the dark room with a solution made by dissolving one ounce of potassium bichromate in fifteen ounces of water, warming gradually, then adding two ounces of fine gelatine, and filtering through linen at the boiling heat. A diapositive is taken from an ordinary negative and laid with the collodion side to the gelatine face of the prepared plate in diffused light for from ten to thirty minutes. The plate is then washed with water in the dark room for five to ten minutes, till the relief is fully developed. The plate is then dried with filter paper, and coated with glycerine by means of a camel-hair pencil and the excess of liquid removed with filter paper. From this plate a cast is made in plaster of Paris of the consistency of oil, and from this plaster cast a metal stereotype copy is taken in the usual way. See Stereotypy, in SUPPLEMENT, No. 310.

(2) L. N. P. writes: I have been experimenting in making paper matrices for stereotype plates according to your directions in answer to O. T. M., and have succeeded in making very good matrices, but I have not been so successful in casting the plates from these—the melted metal refusing to run into and properly fill some parts of the matrix. Can you give us directions that will enable us to cast the plates as well as make the paper matrices? A. You will find practical directions for casting stereotype plates in SUPPLEMENT, No. 310.

(3) H. S. P. asks: 1. Can a kerosene oil stove, burning the best oil, be used in a study room, for any length of time, without serious injury to the health of the occupant? The stove is movable and not connected with any flue. A. Unless adequate provision is made for the escape of the products of combustion from

the room as rapidly as formed, the atmosphere of the room soon becomes seriously polluted thereby. A. Can you suggest any way of obviating the difficulty? For example: Would it be possible to purify the air as it leaves the stove by passing it through some liquid? A. We know of no practical way of obviating the difficulty by chemical means. If the room contains a window a suitable flue is easily constructed.

(4) T. M. D. writes: Please give me a rule by which I can find the capacity of pipes or tubes. A. To ascertain the contents of a pipe multiply the square of its diameter in inches by 0.7856, and the product by the length of the pipe, in inches. This divided by 231 (cubic inches in a gallon), gives the contents of pipe in standard gallons. 2. How many gallons in a pipe 5,000 feet long and 1 1/4 inches in diameter? A. About 33-1 gallons.

(5) A. D. L. asks: 1. Can you tell me of any cheap method of treating cloth, by a coating or otherwise, which will render it proof against the action of strong sulphuric acid? A. We know of no preparation that will answer your requirements. 2. How is rubber tubing made? A. See page 3993, SUPPLEMENT, No. 257. 3. Can vulcanized rubber be melted or liquefied? If so, how? A. Vulcanized rubber cannot be melted or dissolved without destroying its properties.

(6) H. E. writes: I see in your SCIENTIFIC AMERICAN, on page 297, No. 19, in an article entitled Nickel Plating, this: "A bath of pure granulated tin, tartar, and water." I would like to ask what it is and how made? A. Cream of tartar is dissolved in hot water, to make a strong solution, and granulated tin and nickel put into this and boiled in the liquid.

(7) J. B. G. asks: If you take from the finest cast steel all the carbon, is the quality of the metal (steel) improved thereby or otherwise? A. When the carbon is entirely removed from ordinary steel it becomes soft iron.

(8) F. W. K. asks: 1. Will a log travel faster than the current in which it floats? Will a log travel faster than a ship? A. Under ordinary conditions, no. 2. Is the gas of a blacksmith's fire injurious to a man's health? A. Yes.

(9) R. H. J. writes: I have a quantity of sheet zinc, the surface of which I wish to stain or color a solid black. Can you tell me how this may be economically done? A. First scour the metal with fine quartz sand moistened with dilute muriatic acid, and after rinsing quickly put the sheets into a solution of equal parts potassium chlorate and oil of vitriol. A slight velvety black deposit is immediately formed. Rinse the plates and let them dry; then plunge them into a thin varnish composed of asphaltum dissolved in benzine, drain, and rub with a cotton rag.

(10) R. V. J. asks: 1. Is excluding the air and a cool temperature all that is necessary to preserve eggs? A. See "How to Preserve Eggs," page 3, vol. xlv. 2. Is there any paper compact enough to keep air from passing through it? A. No; but paper can be rendered "airproof" by means of varnishes. 3. Is tin the cheapest material that will not pass through? A. It would not be difficult to find an "airproof" substance cheaper than tin. 4. Will relief from a portion of atmospheric pressure exclude the air sufficient to preserve organic substances from decay? A. No; decay or putrefaction is due to the presence of putrescible germs found in all organic substances exposed to the atmosphere rather than to the action of the air. 5. Is confined air a non-conductor of heat? A. No; but it is an exceptionally poor conductor of heat.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

R. J. McD.—Impure barium sulphate—heavy spar—chiefly used for adulterating white paints.—C. H. E.—The scale is composed chiefly of lime carbonate. The water may be safely used for potable purposes.—M. G. S.—It is a fair bituminous coal, but contains a large per cent of ash.—J. R. E.—An argillaceous hematite iron ore containing mica.—C. W.—Clay iron stone—an impure iron ore.—W. E. H.—Limestone and quartzite—contains no metals of value.—H. C.—A talcose slate rock containing much iron sulphide.—R. E. P.—An argillaceous limestone—some of this stone might make a good cement.—B. G. N.—No. 1. Red jasper—a variety of quartz; 2 and 3, flint; 4, lime carbonate; 5, and 7, limonite—iron oxide; 6, limestone.—W. H. B.—Partially decomposed feldspathic rock.—H. B. N.—Sandstone.—D. W.—Pyrites—iron sulphide—in limestone rock.—I. B. S.—Ferruginous quartz—contains a little hornblende and mica.—M. S. M.—Fluorspar—calcium fluoride. Used as a flux in some metallurgical operations and by potters. Its powder exhibits strong phosphorescence when heated in the dark.—T. S. S.—Composed chiefly of sulphur and manganese oxide.—A. B. H.—An analysis would be necessary to determine the composition of the preparation.—J. W. S.—It is powdered talc.

COMMUNICATION RECEIVED.

On the Lungs By T. H. and W. S.

NEW BOOKS AND PUBLICATIONS.

ROCKLAND CEMETERY. By William Wales. Illustrated. 16mo, pp. 157. New York: A. D. F. Randolph & Co.

While aiming to present the advantages of the new and beautiful park cemetery at the head of the Palisades of the Hudson, to those who desire an attractive resting place for their dead, this volume offers an agreeable variation from the customary literature of the cemetery, in a number of bright and hopeful chapters embracing many choice selections in prose and poetry relative to the "final inevitable." The book is handsomely printed and illustrated by a score of views in the cemetery and up and down the Hudson from its several plateaus.

GOLD, SILVER, UND EDELSTEINE (GOLD, SILVER, AND PRECIOUS STONES). By Alexander Wagner. 260 p. Wien. Pest. Leipzig: A. Hartleben. 1881.

This work contains carefully prepared treatises on gold and silver, their chemical properties and combina-

tion, alloys, and the manner of preparing them, and the art of casting, soldering, cleaning, and polishing gold and silver both by the chemical and mechanical processes. The ornamentation by means of niello and enamel is carefully described, as well as the manufacture of plated ware, and gold and silver plating, by means of a battery or the fire process. A brief description of the precious stones, pearls, corals, and imitation stones, completes this interesting publication, which will be found to be of very great service to the jeweler and gold and silver smith, as all the results, formulae, etc., given are based on practical experience.

MARBLE AND GRANITE WORKER'S GUIDE. Compiled by Frank M. Nichols. Chicago: Nichols & Co. Quarto, pp. 192. Price \$6.

The compiler has brought together a number of practical papers and a large number of recipes bearing upon the stonecutter's art, with special reference to gravestone and monumental work. The instructions given would appear to be in the main sound and useful, though not always skillfully put or well edited.

English Patents Issued to Americans.

From December 1 to December 13, 1881, inclusive.

- Bricks, tiles, etc., E. L. Ransome, San Francisco, Cal. Car trucks, etc., J. N. Smith, New York. Cloaks and dresses, L. Lojca, New York city. Electric light, J. S. Williams, Riverton, N. J. Electric light, J. S. Williams, Riverton, N. J. Electrical conductors, covering, H. S. Maxim, Brooklyn, N. Y. Grain grinders, W. D. Gray, Milwaukee, Wis. Looms, W. Talbot, Philadelphia, Pa. Nail machines, J. Cayne, Pittsburg, Pa. Nippers, T. O. Hall, Brooklyn, N. Y. Ornamented fabrics, Fabric Ornamenting and Manufacturing Company, New York city. Ornamental glass, Budd & Grant, Boston, Mass. Railway signals, W. S. Shaffer, Philadelphia, Pa. Rice, etc., cleaning, F. Brotherhood, Charleston, S. C. Rubber boots and shoes, F. Richardson, Providence, R. I. Steam generators, S. W. & N. W. Pratt & Co., Brooklyn, N. Y. Screws, American Screw Company, Providence, R. I. Telephone Transmitters, E. H. Johnson, New York. Window glass, securing, T. Tanner, Osage, Neb. Curing meat, fish, etc., A. Fowler, New York city.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week Ending December 13, 1881,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of Patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing various inventions and their patent numbers, including Agricultural implement, Amalgamator, Annealing furnace, Auger, Bag holder, Baling press, Bar, Bath, Bearing, Bed bottom, Bed lounge, Bellows, Belting, Bicycle, Bicycle head blanks, Bicycle lantern holder, Bicycle neck and spindle blanks, Bicycle steering head, Bicycle wheel felloes, Billiard cue, Bit and drill stock, Boat and method of constructing, Boiler, Boiler furnace, Bolt, Boot and shoe heels, Boot and shoe strap, Boot heel, Boot jack, Boot or shoe, Bottle, Box, Box barrel, Brake, Bran dresser, Bridge, Bridle, Brush, Burner, Hydrocarbon burner, Button, Button hole cutter, Button or stud, Buttons and studs, Bowman, Calendar, Cane, Cane method of and apparatus for treating sugar, Car brake, Car brake, Car brake and starter, Car brake, automatic, Car brake, vacuum, Car coupling, Car coupling.