

## Business and Personal.

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Alden Crushers and Pulverizers manuf'd and sold by the Westinghouse Machine Co., Pittsburg, Pa., U.S.A.

Full Set Patent Office Reports, 1846 to 1871, inclusive, for sale. J. C. House, Lowell, N. Y.

At all seasons of the year use Van Bell's "Rye and Rock," which is the only genuine.

Rock Drill, with Hose and Portable Boiler. Machinery Exchange, 261 N. 3d St., Philadelphia, Pa.

For all kinds of Special Rubber Goods, address Akron Rubber Works, Akron, O.

For Sale.—Iron Tanks, imported, about 100 gallons capacity. at \$10. Address 12 Cedar St., New York.

Authors of Unpublished Works should correspond with Local Printing House, Silver Creek, N. Y.

Use the Vacuum Oils. The best car, lubricating, engine, and cylinder oils made. Address Vacuum Oil Co., No. 3 Rochester Savings Bank, Rochester, N. Y.

Valuable Manufacturing Property for sale at half value, if sold at once. Situated in North Adams, Mass. Consisting of fourteen acres and thirty-seven buildings. Fine brick mill, five stories, 150 x 50, with fine water power, two elegant dwelling houses, twenty-eight tenement, and numerous other buildings. Dwellings and tenements rented. For terms, apply F. S. Perrin, Albany, N. Y.

The Patent for the Novel Fire Kindler illustrated on page 214, current volume, is for sale. Address Wm. Rausch, 1328 Wood St., Philadelphia, Pa.

Engines and Boilers: 16 x 48, 15 x 30, 13 x 30 inch Horizontal; 16 x 28 Upright Engines; 30, 40, and 80 H. P. Locomotive Boilers; 20 to 45 H. P. Horizontal Tubular Boilers. Second-hand, but guaranteed in good order. Full line second-hand Wood-working Machinery. Send for descriptive list. Belcher and Bagnall, 40 Cortland St., N. Y.

For a Two Horse Roper Caloric Engine, nearly new, inquire of E. West, Lockport, N. Y.

Lathes, Planers, Drills, with modern improvements. The Pratt & Whitney Co., Hartford, Conn.

Owners of steam boilers can save fuel, repairs, and delays by using Hotchkiss' Mechanical Boiler Cleaner, which removes all mud or scale-making properties from the boiler. Send for circular. 84 John St., New York.

The Eureka Mower cuts a six foot swath easier than a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send for circular. Eureka Mower Company, Towanda, Pa.

Eclipse Fan Blower and Exhauster. See adv., p. 220.

The Newell Universal Mill Co., Office 7 Cortland St., New York, are manufacturers of the Newell Universal Grinder for crushing ores and grinding phosphates, bone, plaster, ceylwoods, and all gummy and sticky substances. Circulars and prices forwarded upon request.

Blake "Lion and Eagle" Imp'd Crusher. See p. 221.

Ten Double-acting Presses, 8 single-acting Presses, 127 Foot Presses, for sale by The George Place Machinery Agency, 121 Chambers St., N. Y.

For best Duplex Injector, see Jenks' adv., p. 204.

Portable Railway Track and Cars of all Descriptions for Railroad Grading, Sugar Plantations, Mines, etc. Send for circulars. F. W. Corey & Co., 162 Broadway, N. Y.

L. Martin & Co., manufacturers of Lumpblack and Pulp Mortar-black, 226 Walnut St., Philadelphia, Pa.

Send to John D. Leveridge, 3 Cortland St., New York, for illustrated catalogue, mailed free, of all kinds of Scroll Saws and Supplies, Electric Lighters, Tyson's Steam Engines, Telephones, Novelties, etc.

The Twin Rotary Pump. See adv., p. 206.

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

Jenkins' Patent Valves and Packing "The Standard." Jenkins Bros., Proprietors, 11 Dey St., New York.

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

Wood-Working Machinery of Improved Design and Workmanship. Corliesman, Egan & Co., Cincinnati, O. Brass & Copper in sheets, wire & blanks. See ad, p. 237.

The "1880" Lace Cutter by mail for 50 cts.; discount to the trade. Sterling Elliott, 262 Dover St., Boston, Mass.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor House, New York.

For best Indirect Radiators, see adv., page 237.

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

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

Wren's Patent Grate Bar. See adv. page 237.

Power, Foot, and Hand Presses for Metal Workers. Lowest prices. Peerless Punch & Shear Co., 52 Dey St., N.Y.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y.

New Economizer Portable Engine. See illus. adv. p. 237.

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

Best Oak Tanned Leather Belting. Wm. F. Forpaugh, Jr., & Bros., 531 Jefferson St., Philadelphia, Pa.

Stave, Barrel, Keg, and Hoghead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.

Houston's Four-Sided Moulder. See adv., page 237.

Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

For Mining Mach'y, see adv. of Noble & Hall, p. 236.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information C. H. Brown & Co., Fitchburg, Mass.

The Sweetland Chuck. See illus. adv., p. 204.

Nickel Patenting.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Condit, Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

The I. B. Davis Patent Feed Pump. See adv., p. 205.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 205.

Moulding Machines for Foundry Use. 33 per cent saved in labor. See adv. of Reynolds & Co., page 205.

Peck's Patent Drop Press. See adv., page 236.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'rs, 23d St., above Race, Phila., Pa.

Turbine Wheels; Mill Mach'y. O. J. Bollinger, York, Pa.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

Clark Rubber Wheels adv. See page 236.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

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

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

Eagle Anvils, 10 cents per pound. Fully warranted.

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

Geiser's Patent Grain Thrasher, Peerless, Portable, and Traction Engine. Geiser M'fg Co., Waynesboro, Pa.

Burgess' Portable Mechan. Blowpipe. See adv., p. 204.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J.

Long & Allstatter Co.'s Power Punch. See adv., p. 220.

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

For Light Machinists' Tools, etc., see Reed's adv., p. 221.

4 to 40 H. P. Steam Engines. See adv. p. 221.

Grain Nickel, Nickel Salts, Nickel Anodes, Composition, Feit Buff Wheels. Greene, Tweed & Co., New York.

Rollstone Mac. Co.'s Wood Working Mach'y adv. p. 237.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 237.

Rue's New "Little Giant" Injector is much praised for its capacity, reliability, and long use without repairs. Rue Manufacturing Co., Philadelphia, Pa.

Saw Mill Machinery. Stearns Mfg. Co. See p. 237.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

Cotton Belting, Rubber Belting, Leather Belting, Polishing Belts. Greene, Tweed & Co., 118 Chambers St., N. Y.

Skinner & Wood, Erie, Pa., Portable and Stationary Engines, are full of orders, and withdraw their illustrated advertisement. Send for their new circulars.

Saunders' Pipe Cutting Threading Mach. See p. 237.

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

Toope's Pat. Felt and Asbestos Non-conducting Removable Covering for Hot or Cold Surfaces; Toope's Pat. Grate Bar. C. Toope & Co., M'fg Agt., 353 E. 78th St., N. Y.

Use Vacuum Oil Co.'s Cylinder Oil, Rochester, N. Y.

Don't buy a Steam Pump until you have written Valley Machine Co., Easthampton, Mass.

For Machinists' Tools, see Whitcomb's adv., p. 237.

Vick's Seeds best in world. Floral Guide tells how to grow them. See adv., p. 204.

Wiley & Russell M'fg Co. See adv., p. 204.

## NEW BOOKS AND PUBLICATIONS.

THE STEAM ENGINE AND ITS INVENTORS. By Robert L. Galloway. London: Macmillan & Co. 12mo, cloth.

An admirable historical sketch of the origin of the cylinder and piston engine, the application of steam to it as a motive power, and the development of the steam engine during what may be called its germinal period, closing with Watt, Stephenson, and Fulton.

LIFE HISTORY OF OUR PLANET. By William D. Gunning. New York: R. Worthington. 12mo, cloth.

It is a rare thing to find a book of this class which is at once entertaining in style and strictly scientific in matter, method, and spirit. Mr. Gunning is obviously well informed with regard to the later results and tendencies of biology, paleontology, and geology; and he has displayed in these lectures not a little skill in grouping and describing in plain English the more significant facts and laws of the evolution of life forms through the geologic ages. The intelligent reading of the book, however, presupposes an amount of scientific knowledge not likely to be possessed by the average "popular" reader.

IS DARWIN RIGHT? OR, THE ORIGIN OF MAN. By William Denton. Wellesley, Mass.: Denton Publishing Company. 12mo, cloth.

Twenty-five years ago Mr. Denton was widely known as a champion of "advanced" notions with respect to geology and human history. During his career as a popular lecturer he has undoubtedly done good work in combating the older unscientific traditions of the multitude. But the cast of his mind is essentially unscientific, and his knowledge would appear to have been gained mainly by reading. His book is interesting and suggestive; but it betrays throughout the incompetence of the author to grasp the exact conditions of the problem he attempts to answer.

BENJAMIN PEIRCE. A MEMORIAL COLLECTION. By Moses King. Cambridge. Sq. 12mo, paper.

Contains a portrait of the late Professor Peirce, of Harvard, a biographical sketch by Dr. Thomas Hill, several obituary and editorial notices from public prints, funeral discourses, and other memorial matter. Mr. King's work has been neatly done.

COMMERCIAL RELATIONS OF THE UNITED STATES. Reports from Consuls. No. 2. November, 1880. Washington: Government Printing Office.

One of the most commendable acts of the late Secretary of State was the organization of a system of reports from our consuls abroad touching the commerce, manufactures, etc., of their districts, with special reference to opportunities for increasing the foreign commerce of the country. The practical value of such reports is greatly enhanced by their early publication; and it is to be hoped that the new administration will not allow this useful publication to be neglected.

## Notes &amp; 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.

(1) E. W. R. writes: 1. I have a large white clam shell on which I wish to paint. The inside is covered with a roughness that looks like lime. Will you kindly tell me what will clean the inside of this shell? A. Use a soft piece of cloth moistened with dilute aqueous solution of oxalic acid; rinse thoroughly, dry, and finish with a little fine whiting moistened with oil. 2. What will clean bronze and take off fly specks? A. Use a sponge moistened with warm wine spirit; go over the surface quickly.

(2) J. D. R. asks: 1. How do you make red and green lights? A. For colored fires see answer to A. M. G. (23), page 155, No. 10, current volume. 2. What will make a dense white smoke that one may throw a shadow on? A. Sulphide of antimony (powdered) burned with niter gives a thick white smoke. It should not be used indoors, as it is very pernicious. The vapors of heated muriatic acid and strong ammonia water when brought into contact also produce dense white vapors. This is less objectionable than the antimony.

(3) C. K. H. writes: 1. In SUPPLEMENT of September 23, 1876, I find receipt for black ink: 1 part soluble nigrosine in 80 parts water. Will ink made in this manner spoil or fade in bottles by age? A. No. 2. What can be added to this ink or to crystal black aniline ink that will give a glossy appearance? A. Add a suitable quantity of sugar and gum arabic.

(4) J. C. writes: I wish to know how to mix lead and zinc—a cheap process. A. Mix the fused metals well together; stir until cooled nearly to the point of solidification; then cast. If the casting is large, so that the alloy does not chill at once, the metals are apt to separate somewhat unless the mould can be reversed or moved about.

(5) W. A. H. asks: Will iron, etc., draw from a magnetic compass needle its magnetic properties if placed near it for a length of time? A. No; it will rather tend to strengthen it.

(6) J. P. C. asks: 1. Were the tests made by government engineers on boilers printed? A. No. 2. How can I calculate the amount of water thrown by a lift pump in an hour: the cylinder 3½ inches diameter, length of stroke 32 inches, number of revolutions 28 per minute? A. Multiply the area of the piston in inches by the stroke in inches, deduct 5 per cent for losses; the result is the number of cubic inches per stroke, which multiply by the number of strokes per minute.

(7) A. W. asks: Are there more miles of railway in the United States than there is in the rest of the world? Has Siberia or China a railroad? A. There are about 98,000 miles railroad in Europe, 93,000 in the United States, and 37,000 in the rest of the world. Siberia has a few miles of the commencement of a road. China had a short road, but it has been taken up.

(8) J. M. F. asks (1) for recipe for a good ink powder. A. Ink powders.—a. Reduce best quality of soluble nigrosin to impalpable powder by grinding. The powder dissolves in water, forming an excellent ink. b. Pure crystallized sulphate of iron, 2 lb.; tannic acid, 1 lb.; indigo carmine, 2½ oz.; reduce all to powder and triturate well together; gradually add ½ oz. crushed cloves. These proportions will produce something over a gallon of very fine ink (fluid) when mixed with enough warm water. 2. A receipt for silverscraper scouring soap for cleaning all kinds of metals, etc. A. Tallow or grease, 100 lb.; rosin, 80 lb.; silicate of soda, 15 lb.; fine silicious sand, 12 lb. Saponify the grease by boiling with about 15 lb. of caustic soda, dissolved in water to form a lye of about 15° B. Saponify the rosin by boiling with 4 gallons of soda lye at 30° B., and add to it the silicate of soda. Having separated the grease soap mix it at boiling by beating with the resin soap and water glass and the silica. Stir while cooling in the frames.

(9) G. C. S. writes: Will you please state through the columns of your paper the thickness of the heaviest iron armor plating made and in use on naval floaters or turret ships to withstand the heaviest guns? A. 14 inches in a single thickness. 2. What thickness of iron the heaviest of the improved modern guns have pierced? A. About 12 inches.

(10) A. H. C. writes: 1. I have made a Blake transmitter which works to perfection with the single exception of an occasional cracking noise. I use four cells of Leclanche battery instead of one, as I find the transmitter works louder. The cracking noise does not come from the main line, nor from the transmitter, as I have proved by tests. Does it come from the battery, and if so can it be remedied? A. The noise referred to is probably made by the combustion of the carbon due to the passage of the battery current. Where this occurs it speedily destroys the efficiency of the instrument. 2. Should the carbon in transmitter be of

the hardest kind, and why? A. To obtain the best results the carbon should be hard and well polished.

(11) C. R.—The diameter of each of the four cables of the great suspension bridge between New York and Brooklyn is 15¼ inches. Each cable is composed of 19 strands of No. 8 galvanized steel wire (about an eighth of an inch in diameter), 280 wires to the strand, or 5,320 wires each cable. In other words, the bridge floor is suspended on 21,280 one-eighth inch steel wires, each 1,600 feet long between the granite towers.

(12) C. W. B. writes: 1. I have 2 oz. of No. 36 silk covered wire. Please state dimensions for making the largest induction coil, that I may use all my wire. A. Make the core 3 inches long and ½ inch in diameter. Wind it with three layers of No. 18 wire, then fill your spool with the No. 36 wire. 2. Will the above coil light one gas burner, with one cell of the Smees battery (plates 3x4 inches)? A. If well made and a condenser applied it will light gas. 3. Would this be too strong for shocks? A. No, providing the cone be made movable, so as to regulate the current.

(13) R. D. asks: What metal is best to use on push buttons, switches, etc., to give good connections? I have been using German silver, but it don't answer the purpose well. A. Use copper or platinum.

(14) J. B. asks (1) how I can obtain a good permanent red color on cotton yarn by dyeing with Brazil wood or Cochineal? We have tried several methods, but we do not succeed in getting a fast color. A. The following are practical receipts: For 50 lb. cotton: 1. Mordant with 15 lb. sumac and 10 lb. alum. Dye with 6¼ lb. cochineal. Leave 24 hours in the sumac; lift, make up the solution of alum hot. Winch in this for 2 or 3 hours; lift, wash in two waters; boil the cochineal; put off the boil; enter and winch till full enough, then wash and dry. 2. Mordant with 16 lb. sumac and cotton spirits 3° Twad; dye with 24 lb. lima wood or Brazil wood; sumac 24 hours, lift and winch in spirit tub, and wash out. Boil the wood, decant the clear liquor, enter, and winch 30 minutes; raise with alum. Cotton spirit may be prepared by dissolving in 1 lb. of a mixture of 4 parts muriatic and 1 part nitric acid 3 oz. fine tin; reduce with water.

(15) H. F. G. asks: Who first invented the governor for regulating the speed of engines? A. James Watt.

(16) N. B. M. asks: 1. Will the galvanized steel wire such as is used for fencing make a good lightning rod? A. Yes if ten or fifteen are twisted together to form a single rod. 2. Does the coating on the wire affect its conducting power? A. No.

(17) H. H. K. asks what it is that the Chinese use in making their wash glossy. A. They are said to moisten the starched linen with raw starch water containing a little blood albumen. The gloss is developed by hard rubbing with a small polishing iron.

(18) I. P. writes: 1. I want the best and simplest process of embalming human bodies. Can you give me the information I need? In SUPPLEMENT, No. 266 (Feb. 5), page 4237, top, is a method. Is there a better one? Give particulars of process for practical use, or refer to where to find process. A. See page 813, SUPPLEMENT, No. 51; also pp. 371, 117, 103, and 391, vol. xxxvii., and 139 (5) vol. xxxix., SCIENTIFIC AMERICAN. 2. What is the best dye to color whiskers and hair brown or black? A. The expressed juice of the bark of green walnuts is said to be one of the best.

(19) A. J. S. writes: I have a row of ground glass window panes that I would like to have transparent one third at the top. Can you tell me of a varnish or anything of the kind that will make them so? A. Varnish will not do it; the glass must be polished.

(20) C. A. H. asks if zinc will do to line a fresh water tank. The tank is 26 feet long, 6 wide, and 4 high. Will it last ten years? A. If the water is not to be used for drinking or cooking purposes, yes. Under favorable circumstances it will last ten years. The wood of drinking water tanks may be preserved by coating it with genuine asphaltum, purified by melting it over a fire and stirring it occasionally for six hours. Apply to the dry wood and let it stand several days before wetting. It is better to run off the first water.

(21) J. L. D. asks: How can I make a black preparation with linseed oil to make thin cloth waterproof and yet pliable? A. Add half a pound patent drier per gallon of oil, and enough lampblack to color. Heat the oil, apply with a brush, and dry at 100° Fah.

(22) W. E. S. & Co. ask (1) where to obtain marine glue. A. Address any large dealer in philosophical goods. 2. How is it prepared? A. See receipts for marine glue, page 2510, No. 158, SCIENTIFIC AMERICAN SUPPLEMENT.

(23) F. D. H. writes: I have seen at hotels in New York articles of porcelain and glass ware that had been broken and mended, by placing what appeared to be small copper "dogs" or staples across the line of fracture, the ends of which appeared to be cemented into holes drilled into, but not through, the material. Can you inform me how this is done, how the holes are drilled, and what cement is used? A. Holes may be bored in porcelain by means of an ordinary machine drill. The drill is kept moist with oil of turpentine, and caused to revolve rapidly by taking one twist of the string of a bow about it and drawing the bow quickly backward and forward, after the manner of using a saw, while the head of the drill is held in position by a loose oiled brace. Use the waterproof cement described at the bottom of page 2510, SUPPLEMENT, No. 158, article on cements.

(24) G. A. N. asks: 1. Are type metal castings made heavy, suitable for small engine castings, say 1x2 cylinder? A. They would answer, but are not so good as steam metal or iron. 2. Of what material are the steam way cores for such small castings made, and how are they removed from the casting? A. Generally of composition or brass. 3. Is there an electric motor in the market of sufficient power to practically operate a sewing machine? A. Edison's motor will do this.

(25) G. C. S. asks: 1. Should the cutters in a milling machine be lubricated for milling common