

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 Buckeye Engine Co. Automatic Cut-off Engines, condensing or non-condensing, 10 to 1,000 H. P. Power, economy, and governing guaranteed. 87 Liberty St., N. Y.

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

Cornice Brakes. J. M. Robinson & Co., Cincinnati, O. Sperm Oil, Pure. Wm. F. Nye, New Bedford, Mass.

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

Water Wheels, increased power. O. J. Bollinger, York, Pa.

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

Vertical & Yacht Engines. N. W. Twiss, New Haven, Ct. Painters' Metal Graining Plates. J. J. Callow, Cleveland, O.

Blake's Belt Studs, the best fastening for Rubber and Leather Belts. Greene, Tweed & Co., 18 Park Place, N. Y.

The SCIENTIFIC AMERICAN Export Edition is published monthly, about the 15th of each month. Every number comprises most of the plates of the four preceding weekly numbers of the SCIENTIFIC AMERICAN, with other appropriate contents, business announcements, etc. It forms a large and splendid periodical of nearly one hundred quarto pages, each number illustrated with about one hundred engravings. It is a complete record of American progress in the arts.

Scroll Saws.—Three 2d hand, Cordesman, Egan & Co. make. Send for cuts. Steptoe & Co., 214 W. 2d St., Cin. O.

For Sale.—A 30 ft. Yacht. Yacht and Stationary Engines. Iron and Wood Machinery. S. E. Harthan, Worcester, Mass.

The undersigned wish to obtain financial assistance to carry on a valuable and lucrative industry. Address Cobb & Schreiner, New Iberia, La.

Improved Steel Castings; stiff and durable; as soft and easily worked as wrought iron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburgh Steel Casting Company, Pittsburgh, Pa.

Wanted.—Party to Manufacture on Royalty a Spring Draught Attachment for Vehicles. R. W. Smalley, Salem, Mass.

Rubber Belting, Packing, Hose, and Manufacturers Supplies. Greene, Tweed & Co., 18 Park Place, N. Y.

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

Valuable Invention to users of Steam Boilers. See advt., page 318, last issue. Address U. S. Automatic Stoker Co., No. 2 Chestnut St., Philadelphia, Pa.

Presses, Dies, and Tools for working Sheet Metals, etc. Fruit and other Can Tools. Bliss & Williams, Brooklyn, N. Y., and Paris Exposition, 1878.

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

For Heavy Punches, Shears, Boiler Shop Rolls, Radial Drills, etc., send to Hilles & Jones, Wilmington, Del.

Improved Wood-working Machinery made by Walker Bros., 73 and 75 Laurel St., Philadelphia, Pa.

The great Wheelock Engine, which furnishes the power to the machinery of the American Exhibit at the Paris Exposition this year, is lubricated by Patent Lubricant and Cups. Our exhibit will equal that which we made in Philadelphia in 1876. R. J. Chard, 134 M. Lane, N. Y. city.

Fricition Clutches for heavy work. Can be run at high speeds, and start gradual. Safety Elevators and Hoisting Machinery a specialty. D. Frisbie & Co., New Haven, Ct.

24 inch Second-hand Planer, and 12 inch Joiner, or Buzz Planer, both in first-class order, for sale by Bentel, Margedant & Co., Hamilton, Ohio.

Wrenches.—The Lipsey "Reliable" is strongest and best. Six inch sample by mail 60 cents. Roper Caloric Engine Manufacturing Co., 91 Washington St., N. Y.

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See ad. back page.

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

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.

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.

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

Manufacturers of Improved Goods who desire to build up a lucrative foreign trade, will do well to insert a well displayed advertisement in the SCIENTIFIC AMERICAN Export Edition. This paper has a very large foreign circulation.

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

Special Planers for Jointing and Surfacing, Band and Scroll Saws, Universal Wood-workers, etc., manufactured by Bentel, Margedant & Co., Hamilton, Ohio.

Climax Washing Machine. Reliable Agents wanted. Descriptive circulars furnished. N. C. Baughman & Co., York, Pa.

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

Lansdell's Steam Siphon pumps sandy and gritty water as easily as clean. Leng & Ogden, 212 Pearl St., N. Y.

For Best Insulated Telegraph Wire, Telephone Wire, and Flexible Cordage, Eugene F. Phillips, 67 Stewart St., Providence, R. I. W. H. Sawyer, Electrician and Supt.

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

Dead Pulleys, that stop the running of Loose Pulleys and Belts, taking the strain from Line Shaft when Machine is not in use. Taper Sleeve Pulley Works, Erie, Pa.

Notes & Queries

(1) T. S. writes: I am prevented from sleeping by noises in the next room, such as talking, walking, etc. Is there any simple means of deadening the sounds? A. One method is to wear a night cap having very thick soft pads of wool or cotton arranged to cover the ears.

(2) H. M. writes: 1. I have a cylindrical boiler, 7 feet long, 38 inches diameter; fire box 20 by 36 inches; 26 flues, 2 inches, 4 1/2 feet long. What is the power of boiler? A. We do not know of any standard rule for estimating the power of a boiler. 2. My engine has a 5 x 9 inch cylinder. What number of strokes should it make? A. You can run the engine from 250 to 300 revolutions per minute.

(3) F. T. W. asks: How is soluble acid chromate of lime made? A. Boil 33 parts of potassium bichromate in a porcelain-enameled iron vessel with 300 parts of water; cool a little, and add to the solution 1 1/2 times its volume of strong oil of vitriol. When perfectly cool decant the liquid, gather the crystals of chromic acid upon a porous tile, and cover with a jar for an hour. Then dissolve the crystals in 400 parts of water, boil, gradually add 57 parts caustic lime, filter, and evaporate the filtrate to dryness.

(4) A. G. G. has constructed a telescope which shows five or six indistinct images, in addition to a well defined one, and wishes to know wherein the fault lies. A. You neglect to state whether your deflector is silvered on the concave or convex surface. If on the latter, the trouble is easily accounted for; if on the former you will probably find your eyepieces imperfect. Examine the latter thoroughly and see if they do not produce the reflected images.

(5) A. K. writes: I have to draw the water to a vacuum pan a distance of about 40 feet. Now I think that if I lay a pipe 3 inches in diameter 30 feet, and the other 10 feet a pipe of 2 inches diameter, I would get more water in a given time than by having the whole length only 2 inch piping. Am I right or wrong? A. You would get more water in a given time through the combined large and small pipes, as you propose, because the friction of the water in those pipes would be less than if you used only the small pipe.

(6) L. W. J. asks: What is the amount of sugar in beets? A. Beet juice is commonly estimated to contain from 8 to 10 per cent of sugar, the range being from about 6.5 to 17 per cent.

(7) T. C. D. asks: What kind of machine is used for driving a sand blast for depolishing the surface of glass? A. Any of the small rotary blowers will answer.

(8) E. C. L., referring to the question of E. W. D., page 283, issue of May 4, 1878, writes: The so-called "extra current" probably prevented the telephones from working as well in dry weather as they did on the damp day, for when the wire is a little damp the extra current escapes to a certain extent from the line. If E. W. D. is a practical operator he has no doubt noticed that a wire always works better after a light rain. The telephone, being a more sensitive instrument, is affected so much the more by the condition of the line. If a condenser is used in connection with the telephone it will be found to work well at all times.

(9) W. S. N. asks: What amount of water flow, in gallons, does the miner's inch represent? A. According to some experiments by Professor F. L. Vinton, recently published, the miner's inch is equivalent to a discharge of 0.0254 cubic foot per second.

(10) C. L. G. asks: What is type metal? A. Lead is the chief constituent; antimony is added to compensate for the softness of the lead, and tin to give toughness. Sometimes copper is added in very small percentage to give a still greater degree of tenacity. The proportions used by different makers vary.

In electro-plating, is there a limit in the thickness of the deposited plating beyond which one cannot go? A. None other than the size and efficiency of the apparatus.

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

J. N. H.—No. 1 is iron and copper sulphite (chalcopyrite) and impure limonite. No. 2 is iron sulphide (pyrite) in indurated clay.—W. B.—It is globular marcasite—iron 46.4, sulphur 53.3.—W. L. W.—Slate spar—lime carbonate.—J. E. P.—Tourmaline.—W. H. D.—No. 1 is marble veined with pyrites. No. 2 is limonite. No. 3 is specular iron ore. No. 4 is quartz, orthoclase, and pyrite. No. 5 is galenite, of some value. No. 6, pyrite. No. 7, ilmenite. No. 8, gaylussite. No. 9, phlogopite. No. 10, missing. No. 11, tourmaline. No. 12, quartz. No. 13, barite. The amount of metal in the ores can only be determined by assay.—J. H. S.—The sample of ore sent contains a large percentage of copper and a trace of silver. If the sample is a fair representative of the body of the ore the property is of value.—W. S. L.—Quartz with chalcopyrite (copper-iron sulphide and pyrite). Chalcopyrite is a valuable ore of copper. An assay would be necessary to determine the precise value of the ore.—L. & R. B. N.—It is globular marcasite, containing 46.4 per cent of iron and 53.6 per cent of sulphur.—J. F.—The water contains much iron combined with various organic acids and chlorine. The wood contains tannin, which forms with iron a black stain (ink); hence the darkening of the wood. A little copperas or other neutral salt of iron added to moderately pure water will cause it to impart to the woods mentioned a similar stain under like conditions. The water is of little value for medicinal purposes.

COMMUNICATIONS RECEIVED. The Editor of the SCIENTIFIC AMERICAN acknowledges with much pleasure the receipt of original papers and contributions on the following subjects: Condensation and Steam Heat. By W. R. Cinders in the Eye. By E. H. M. and W. S. N. Mending Boiler. By J. F.

Advertisements. Inside Page, each insertion --- 75 cents a line. Back Page, each insertion --- \$1.00 a line. (About eight words to a line.) Engravings may head advertisements at the same rate per line, by measurement, as the letter press. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

WALTHAM WATCHES. We beg to announce that we have recently entirely remodeled the very popular grades of full-plate movements, known by the marks, "Wm. Ellery," "Appleton, Tracy & Co.," "Waltham Watch Co.," "P. S. Bartlett," and "Broadway," giving to them not only a highly improved appearance, but great additional value. We embody in them such of the best results of our experience and study for twenty years as can be useful in this popular form of watch. We give these new model watches special recommendation to all who look for good performance and solid excellence at moderate cost. The alterations have been made with the view of pleasing practical watch makers, as well as watch wearers. No watches retailed by the Company. Apply to your local jeweler. For AMERICAN WATCH CO., ROBBINS & APPLETON, General Agents, NEW YORK.

New Books. Rock Blasting for Industrial Purposes. By G. G. Andre. Plates. 8vo. \$4.25. Aid Book to Engineering Enterprise Abroad. By E. Matheson. Illustrations. 8vo. \$5.00. Workshop Receipts for Manufacturers, Mechanics and Scientific Amateurs. 8vo. \$2.00. Heat as applied to the Useful Arts. By Thos. Box. Plates. 8vo. \$5.00. Dew Ponds: The Farmers' Summer Water Supplies. By H. P. Slade. Paper. 80c. Stability The Seaman's Safeguard. By E. G. Fishbourne. 24mo. 40c. * * Catalogues sent free on application. E. & F. N. SPON, 448 Broome Street, New York.

THE ONLY Genuine GRISER SELF-REGULATING GRAIN SEPARATOR. Celebrated for its light and smooth movements, also for its PARAFINING and CLEANING all kinds of grain. Manufactured only by THE GRISER MFG CO., Waynesboro, Franklin Co., Pa.

MORE STEAM POWER, AND STEADIER, with less Fuel. Improved Slide Valve, may be put on any Engine at small cost. "Can grind 40 lbs. flour with 4 cords wood." B. P. PERRY, Richmond, Indiana. Agents Wanted. Circulars free. J. F. TALLANT, Burlington, Iowa.

B. W. Payne & Sons, Corning, N. Y. Established in 1840. Eureka Safety Power. h. p. cyl. ht. space. wt. price. 2 3 1/2 x 4 48 in. 40 x 25 1000 \$150. 4 4 x 6 55 46 x 30 1600 250. 6 5 x 7 72 72 x 42 2700 400. Also, SPARE ARRESTING PORTABLES, and Stationary Engines for Plantations. Send for Circulars.

MAKE YOUR OWN ELECTRIC CLOCKS. Cheap but good. For full particulars address, with stamp, A. P. ATENSON, Vermont, Fulton Co., Ills.

KREIDER, CAMPBELL & CO., 1030 Germantown Ave., Phila., Millwrights, Steam Engineers, Builders, and Mill Stone Manufacturers. Contractors for Paper, Flour, Malt, and Saw Mills, Breweries, Paint, Drug, and Chemical Works, Portable Mills, Hoisting Machines, and Patent Mill for Grinding Bones, Fertilizers, etc., Patent Patent Mills, Mill Bushes, Proof Stuffs, Straight Edges, Bolting Cloth, Conveyors, Mill Furnishings. All orders for Jobbing promptly attended to. Trimmer's Patent Smutter, Grain and Sizing Machines.

WARRANTED THE BEST. 1 H. P. Boiler & Engine, \$150. 2 H. P., \$175. 3 H. P., \$200. Te ted to 200 lbs. Steam. LOVEGROVE & CO., 152 N. 3d St., Philadelphia, Pa., Builders of Engines and Boilers, 1 to 100 horse power. Send for circulars and prices, and state size and style you want.

EXPLOSIVE DUST. A COMPREHENSIVE description of the Dangers from Dust in various Manufactures and the Cause of many Fires. How combustible substances can explode. Spontaneous Combustion of Iron, Charcoal, and Lampblack in Air. Flour Dust and Brewer's Dust Explosions. Explosions of Coal Dust in Mines. Contained in SCIENTIFIC AMERICAN SUPPLEMENT No. 125. Price 10 cents. To be had at this office and of all newsdealers.

PATCH BLUE. Latest Article out and 40 best Money Making Articles in the World. Free Sample to Agents for 3 cent stamp for postage. J. BRIDE & CO., 297 Broadway New York.

EVERY DESCRIPTION OF STEEL, IRON, and Brass Screws for Machinery. Send for Catalogue. L. F. STANBISH & CO., 26 Artisan Street, New Haven, Ct.

NO ADVERTISING AGENT can insert an advertisement in our list of twenty-six STANDARD WEEKLIES at ten dollars a line without losing money. Those advertisers who want to obtain the best and largest circulation possible without expending more than from \$30 to \$100 should address GEO. P. ROWELL & CO., 10 Spruce St., New York.

DRAWINGS AND ENGRAVINGS OF MACHINERY A SPECIALTY. PEMBERTON & SCOTT, 37 Park Row, Room 8. RAILWAY APPLIANCES AT THE Philadelphia Exhibition. Being a Paper read before the Institution of Civil Engineers, London. By DOUGLAS GALTON, F. R. S. Showing the characteristic differences between American and European Railways, etc. Both of the above papers are contained in SCIENTIFIC AMERICAN SUPPLEMENT, No. 125. Price 10 cents. To be had at this office and of all newsdealers.

KILL THE POTATO BUGS AND SAVE THE POTATOES. SURE DEATH to the Colorado Potato Bug is only to be had by the use of Paris Green. Prof. Cook and others say that all other remedies have failed. ENDORSED BY W. FULLER, AGRICULTURAL EDITOR OF THE "SUN."

PURE PARIS GREEN, Made by F. W. Devoe & Co., can be relied on for the extermination of the Potato Bug and Cotton Worm. Circular on the use of Paris Green distributed free on application. F. W. DEVOE & CO'S MIXED PAINTS. For the convenience and economy of consumers of PAINT the well-known house of F. W. DEVOE & CO. now prepare PAINTS READY FOR USE FOR FARMERS and MANUFACTURERS. They are uniform in shade, and the colors can always be matched. Any one can paint with them. No need of a painter to mix it for you. No need of a dryer or other ingredients. The paint is ready for immediate application. Send for sample cards showing different shades. They have very superior covering properties and do not, like the so-called patent paints, contain either water, benzine or alkali. These paints are in Liquid Form, and are sold in Gallon Cans and Barrels. They are also put up in small cans of one to five pounds.

F. W. DEVOE & CO., Manufacturers and Importers of Colors, White Leads, Zinc White, Varnishes and Artists' Materials, CORNER FULTON AND WILLIAM STREETS (OLD DUTCH CHURCH CORNER), NEW YORK CITY.

MILLS For Crushing Bones, Fire Brick, Clay, Phosphates, Hoofs, Horn also for Grinding Wheat, Tobacco, Paint, Slate, Corn, Sumac, Coal, Chalk, Bark, Coffee, Black Lead, Saltpetre, Cochineal, Spices, Ores, and many other substances. Shafting, Pulleys and Machinery in general, manufactured by WALKER BROS. & CO., 3rd and Wood Streets, Philadelphia

BIG PAY.—With Stencil Outfits. What costs 4 cents sells rapidly for 50 cents. Catalogue free. S. M. SPENCER, 112 Wash'n St., Boston. IRON RAILWAY TIES AND SLEEPERS. By CHARLES WOOD, C. E. Twelve illustrations. The various Systems of Iron Sleepers; the Bowl, Pot, or Oval; the Longitudinal Wrought Iron; the Transverse Wrought Iron. Practical experience with each. Durability of Wrought Iron for Sleepers. Adjustment of Gauge on Curves. Spreaung Out. The Barlow Combination Sleeper and Rail. Hills, Hoenegger's, and Thomson's Systems. Serre's and Battigs' Systems. Mc Lellan's and Fotel's Sleepers. Wood's Cross System. The several systems illustrated, with particulars of Basting, Spikes, Keys, Collars, Chairs, and Tools; Labor, First Cost, Repairs, Wear, Corrosion, etc.

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Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at \$3.20 each; additional copies at same proportionate rate. Postage prepaid. One copy of THE SCIENTIFIC AMERICAN and one copy of THE SCIENTIFIC AMERICAN SUPPLEMENT will be sent for one year, postage prepaid, to any subscriber in the United States or Canada, on receipt of seven dollars by the publishers. The safest way to remit is by Postal Order, Draft, or Express. Money carefully placed inside of envelopes, securely sealed, and correctly addressed, seldom goes astray, but is at the sender's risk. Address all letters and make all orders, drafts, etc., payable to

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