

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 best results are obtained by the Imp. Eureka Turbine Wheel and Barber's Pat. Pulverizing Mills. Send for descriptive pamphlets to Barber & Son, Allentown, Pa. Fuller & Stillman, Chemical Engineers and Assayers, 40 Broadway, New York.

Catechism of the Locomotive, 625 pages, 250 engravings. The most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for a catalogue of railroad books. The Railroad Gazette, 73 Broadway, New York.

A party is wanted to manufacture, on royalty, a Combination Pick, patented here and in Europe. Address P. O. Box 374, New York city.

Munger's Constant Seated Valve.—Having tested these valves in our own works and elsewhere, for more than a year, under long continued high pressure and other trying conditions, we can recommend it as being the only valve which, under all circumstances, is tight and durable. We are prepared to negotiate for the manufacture of these valves on royalty, or for the sale of a part or the whole of the patent. Address Munger & Son, East River Conn.

The genuine Asbestos Roofing forms the lightest and most economical roof in use. It can be easily applied by any one. H. W. Johns Mfg Co., 87 Maiden Lane, New York, sole manufacturers

Pat. Steam Hoisting Mach'y. See illus. adv., p. 125. Golden Healing Ointment. See adv., page 141.

The Baker Blower runs the largest sand blast in the world. Wilbraham Bros., 2318 Frankford Ave., Phila., Pa.

Elliott's Lace Cutter, 25 cts. 80 Market St., Chicago, Ill. American Watches.—A reduced price list of over 100 styles of solid Gold and Silver Watches just issued by a reliable jeweler, which will be mailed free to any address by N. H. White, Newark, N. J.

Linen Hose.—All sizes, with or without couplers, in any quantity. Greene, Tweed & Co., 18 Park Pl., N. Y.

The American Standard Gauge and Tool Works of Philadelphia has consolidated with the Betts Machine Company of Wilmington, Del. Standard gauges as well as heavy machine tools now in stock.

Magnets, Insulated Wire, etc. Catalogue free. Goodnow & Wightman, 176 Washington St., Boston, Mass.

Inexhaustible Beds of Kaolin or Clay.—Wanted experienced pottery men to take an interest in the white, pink, and yellow kaolin beds. Digging and shipping on cars will cost 50 cents per ton. M. J. Dobschutz, Belleville, Ill., Agent.

Forsyth & Co., Manchester, N. H., & 213 Center St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery. Send stamp for illus. cat. State just what you want.

The Electric Light in its Practical Application. By P. Higgs. Numerous Illustrations. \$3.50. Mail free. E. & F. N. Spon, 446 Broome St., N. Y.

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

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

H. Prentiss & Co., 14 Day St., New York, Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

The Horton Lathe Chucks; prices reduced 30 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

Linen Hose.—SIZES: 1 1/2 in., 20c.; 2 in., 25c.; 2 1/2 in., 29c. per foot, subject to large discount. For price lists of all sizes, also rubber lined linen hose, address Eureka Fire Hose Company, No. 13 Barclay St., New York.

Workshop Receipts for Manufacturers and Mechanics. Illustrated. \$2.00 E. & F. N. Spon, 446 Broome St., N. Y.

Nickel Plating.—A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N. J.

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

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

Eclipse Portable Engine. See illustrated adv., p. 126.

Eagle Anvils, 9 cents per pound. Fully warranted.

Bradley's cushioned helve hammers. See illus. ad. p. 142.

Band Saws a specialty. F. H. Clement, Rochester, N. Y.

Sheet Metal Presses, Ferracut Co., Bridgeton, N. J.

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

Noise-quieting Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

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

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.

Ornamental Penman's Pocketbook of Alphabets. 32 plates. 20c. Mail free. E. & F. N. Spon, 446 Broome St., N. Y.

New 8 1/2 foot Boring and Turning Mill for sale cheap. A first class tool. Hilles & Jones, Wilmington, Del.

Sawyer's Own Book, Illustrated. Over 100 pages of valuable information. How to straighten saws, etc. Sent free by mail to any part of the world. Send your full address to Emerson, Smith & Co., Beaver Falls, Pa.

Best Turkey Emery in bbls, kegs, and cases. Special rates for large quantities. Greene, Tweed & Co., N. Y.

Shafting, Pulleys, and Hangers. Nadig & Bro., Allentown, Pa.

\$250 Horizontal Engine, 20 horse power. See illustrated advertisement, page 61.

For Sale.—Very low for cash, Engine Lathe, in good order, made by New Haven Mfg. Co. 30 inches swing, will turn 12 feet. Apply to Noble & Hall, Erie, Pa.

Milling, Profiling, Cam Cutting, Revolving Head Screw Machines. Pratt & Whitney Co., Hartford, Conn.

Hydraulic Cylinders, Wheels, and Pinions, Machinery Castings; all kinds; strong and durable, and easily worked. Tensile strength not less than 45,000 lbs. to square in. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Wood-working Machinery, Waymouth Lathes. Specialty, Wardwell Patent Saw Bench; it has no equal. Improved Patent Planers, Elevators: Dowel Machines. Rollstone Machine Company, Fitchburg, Mass.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus'd adv. p. 30.

The new "Otto" Silent Gas Engine is simple in construction, easy of management, and the cheapest motor known for intermittent work. Schleicher, Schumm & Co., Philadelphia, Pa.

Machines for cutting and threading wrought iron pipe a specialty. D. Saunders' Sons, Yonkers, N. Y.

Steam Engines, Automatic and Slide Valve; also Boilers. Woodbury, Booth & Fryor, Rochester, N. Y. See illustrated advertisement, page 29.

Wanted.—Responsible party to build and introduce Thomas' Patent Steam Wheel. Monopoly to right party. Write for description and particulars, to J. C. Thomas, Carlinville, Ill.

NEW BOOKS AND PUBLICATIONS.

DIGEST OF SEEDING MACHINES AND IMPLEMENTS PATENTED IN THE UNITED STATES FROM THE YEAR 1800 TO JANUARY, 1879. Compiled and published by James T. Allen, United States Patent Office, Washington, D. C. Quarto, pp. 1,326. Price \$25.

By permission of the Commissioner of Patents, Mr. Allen has made, with great care and labor, a thorough digest of all the American patents on seeding machines and implements granted to the beginning of the current year. It embraces nearly 4,000 patents, the drawings copied by photo-lithography, the claims given in full, and also brief descriptions of the inventions in such cases as seem likely to be of service. To facilitate examinations the patents have been arranged chronologically under the official classification of thirty-four subdivisions, and the whole work is so indexed that the drawing or claim of any patent may be found by name, number, or date. The advantage of such a work to inventors, manufacturers, patent attorneys, and libraries goes without telling.



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.

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) R. F. B. asks: 1. What is the relative electro-motive force of the gravity battery as compared with the Smee and Bunsen batteries? A. The electro-motive force of the gravity battery is 1.079 volt; Smee's, when not in action, 1.090 volt; when in action, 0.482 volt; Bunsen's chromic acid, 2.028 volts. 2. Can it be used successfully and economically in electro-plating? A. Yes. 3. How many cells are necessary, and how much zinc surface? A. Use a zinc surface equivalent to the surface to be plated. 4. How often should the zincs be amalgamated in a gravity battery constantly in use? A. The zincs in a gravity battery are never amalgamated. 5. At what temperature (Fahr.) should rubber hand stamps be vulcanized, and how long continued in the heat? A. The temperature will vary with the percentage of sulphur incorporated with the rubber. As the rubber is usually prepared it will require at least 2 hours at a temperature of from 250° to 275° Fahr. (85 to 100 lb. pressure). See pp. 48 and 105, Vol. 39, SCIENTIFIC AMERICAN.

(2) J. C. W. writes: In answer to query No. 12, in the SCIENTIFIC AMERICAN for May 31, 1879, you suggest that F. R. D. may use weak solution of ammonia for removing logwood stains from the hands. I would respectfully offer the following as more effectual and speedy, and will also answer the purpose of removing nearly all organic colors, not only from the skin, but from most fabrics: Prepare a concentrated solution of sulphite or hyposulphite of soda, by dissolving either of these salts in water to saturation. I think the sulphite preferable, as the hyposulphite deposits sulphur in the course of the process, which is not always to be desired. This solution may be kept ready for use. Label it No. 1. Prepare a solution of permanganate of potassium in water, using one part of the salt to about one hundred parts of water. It does not keep perfectly well; but as long as it is of a deep purple color it is good. Label it No. 2. Next procure a bottle of ordinary or commercial muriatic acid, which label No. 3. In using this acid it may generally be diluted with from one to ten volumes of water, or if the stain is obstinate it may be used without dilution, and beyond the smarting sensation it produces on the hands no harm will result unless it is used excessively and not washed off soon. If the smarting is too severe it should be washed off at once, and a solution or small quantity of dry bicarbonate of sodium (cooking soda) applied to neutralize the acid, thus converting it into a solution of common salt. Having these solutions—namely, No. 1, sulphite of sodium; No. 2, permanganate of potassium; No. 3, muriatic (hydrochloric) acid—they may be used alternately, without much regard to order, except that, as a general rule, No. 3 must be used last, and the process finished with water

applied until the acid is washed away. Nos. 1 and 3 are in most cases sufficient; but should No. 2 be required it should be followed by both Nos. 1 and 3, always finishing with water. Silk and woolen goods will not stand long treatment with these chemicals. Cotton and linen seem to be unhurt unless the acid is used strong and suffered to remain in the fabric until it is dry. I have never known the skin to be injured beyond the temporary stinging above mentioned. Ink stains and iron rust will succumb to these agents if properly managed. As a matter of caution they should not be used on such colored goods as are wished to retain their colors. The bleaching agent is what is ordinarily known as sulphurous acid, and will be recognized by the familiar odor of burning sulphur or matches with sulphur tips. This odor escapes from the hands rapidly, and in this respect the process is far preferable to any in which chlorine with its disagreeable and more persistent odor is employed. [We have found the use of such reagents seldom necessary; good soap and plenty of water, aided by a little pumice stone, will remove most stains from the hands. When these fail the substances recommended will often prove serviceable; but a small quantity of common bleaching powder, followed by water and a little antichlor (sodium hyposulphite), to destroy any odor occasioned by the former, will generally prove more effectual. For obstinate iron or ink stains, dilute hydrochloric acid should, of course, be used instead.]

(3) A. B. T. asks (1) why salt is used in freezing ice cream. A. The freezing point of salt water is somewhat lower than that of pure water; hence salt causes the rapid liquefaction of ice. A given quantity of ice in melting absorbs a certain amount of heat, and if the liquefaction is accelerated by salt this amount of heat is absorbed in a space of time proportionately less. 2. What is the process of bronzing any article, such as a gun barrel? A. Mix powdered chloride of antimony to a thin cream with olive oil (by trituration), and add a few drops of nitric acid. Spread this uniformly over the warmed iron, and let it remain until the proper color is developed. The brushing and marking is done with the scratch brush and burnisher. Polish with a piece of smooth, hard wood (polishing wood), latquer with thin alcoholic shellac, and polish again.

(4) D. D. asks: 1. Will a 12 foot double deck boiler steam better than a 14 foot one? A. We cannot answer this query without seeing the plans of the boiler. 2. What size of smoke stack do I require for a double deck boiler containing 84 4-inch tubes? A. 36 inches diameter, if your tubes are properly proportioned to the grate.

(5) E. J. D. asks for recipe for making tar varnish. I have tried to mix the benzine and tar both hot and cold, but have always failed on account of the tar thickening up and curdling. A. The curdling is due chiefly to the presence of moisture. Heat it in an iron pot to boiling for 7 or 8 hours, and say 10 per cent of boiled oil, and, when nearly cold, reduce with the solvent.

(6) G. L. writes: I have a shed with quite a flat roof, shingled a few years ago with poor shingles, and, of course, leaks. What is the cheapest and best composition to put on it to stop the leaks and make the shingles more durable? A. Such roofs are sometimes coated with melted asphaltum, and, while this is soft, sprinkled thickly with clean gravel. A roof with a pitch of less than 30° should not be shingled.

(7) J. W. T. asks: What liquid is used in ice machines to make the water freeze? A. Ether, sulphurous anhydride, petroleum ether or chymogene, and liquefied ammonia are commonly employed. See "Ice and Ice Making Machines," SCIENTIFIC AMERICAN SUPPLEMENTS, Nos. 85 and 91, also SCIENTIFIC AMERICAN, pp. 159 and 387, Vol. 38, and 95, 335 and 168, Vol. 37.

(8) W. M. H. asks: Is a pound of baker's bread as nourishing as a pound of home made? What is the best test to discover whether corn starch intended for food has been adulterated? A. Usually the difference in this respect is not great; in many cases the former is to be preferred. The corn starch found in our markets is usually quite free from adulteration. No single test would suffice to detect the foreign substance which may be present. You would require the assistance of an analyst.

(9) J. R. L. asks: 1. Has granite ware proved safe for cooking utensils? A. Yes, when properly made. 2. Is it likely to be superseded by the new mode of treating iron vessels with superheated steam, noticed lately by you, whereby the liability to rust is obviated? A. Probably not. 3. Is annealed glass ware in the market? If not, why not? Have seen nails driven with a hardened glass chimney; but beyond this know of no ware of hardened glass on sale? A. Yes, but the manufacture is chiefly confined to lamp chimneys and similar articles.

(10) S. V. H. asks: 1. What is the resistance of a line, 1/4 miles long, of No. 16 galvanized iron wire? A. 104 ohms. 2. What and how much wire should I put in each spool of an electro-magnet to produce this same resistance? A. About 500 feet of No. 34. 3. Would not a magnet of still higher resistance work still better on this line with a given battery? A. No, the resistance in your instrument and in the line should be equal. 4. At the end of a line I run a wire underground to a well 30 feet from house, in which well I hang a plate of galvanized iron. Should the underground wire be insulated? A. No. 5. A friend and myself made a thermostat of brass and type metal. On heating, the type metal expands the most apparently, as it forces the bar to bend towards the brass. And yet if I understand aright, brass expands much more than type metal in a given variation of temperature. A. The expansion of type metal by heat is greater than that of brass.

(11) J. H. W. M. asks for a first class receipt for a freezing mixture, something similar to salt and ice, but that will last longer. A. For practical purposes the mixture of salt and ice is the cheapest and best. See p. 107 (17), Vol. 38, SCIENTIFIC AMERICAN.

(12) T. E. C. writes: I send sample of residue found in my boilers which floats upon the water. I should like to ascertain what it is. A. It consists

chiefly of silica, silicate of alumina, and lime carbonate, with a small quantity of carbonaceous matters. Much of this would be removed by the use of a feed water heater. 2. Is there any work which treats fully on the use of the steam engine indicator, and what is it called? A. "The Indicator Diagram," by N. P. Burgh.

(13) D. S. S. asks: Could you give the name of anything that will remove the stain in a Brussels carpet made by a purple aniline ink? A. Have you tried alcohol and hot water? It will be difficult to remove the stain completely without injuring the pattern.

(14) M. L. asks (1) for a receipt for making best printer's composition rollers. A. Soak 1 lb. of fine glue in enough cold soft water for 8 hours. Then heat it in a water bath until it is well dissolved, and stir in 1 lb. of hot concentrated glycerine. Molasses is sometimes substituted in part for the glycerine, and resin soap and small quantities of oil and earthy matters are occasionally introduced. The heating must be continued until the greater part of the water has been expelled, when the composition is ready for casting in copper moulds, oiled and warmed. 2. What will remove copying ink stains from the hands? A. Use ammonia water, muriatic acid, and plenty of water alternately, assisted by pumice stone if necessary.

(15) R. E. G. asks: What is the relative strength of steel, iron, brass, and copper wire? A. The following table gives the result of recent experiments made by Mr. David Kirkaldy, of London, to ascertain the tensile strength and resistance to torsion of wire made of various materials:

Table with columns: Specimens of wire tested, Pulling stress per sq. inch. (Hard, Annealed, Pounds.), and No. of twists in 5 inches. (Hard, Annealed, Pounds.). Rows include Copper, Brass, Charcoal iron, Coke iron, Steel, Phosphor bronze, etc.

* Of the 8 pieces of steel tested, 3 stood from 40 to 45 twists, and 5 stood from 1 1/4 to 4 twists.

(16) J. E. L. asks for formula for number of strokes of (1) steam, (2) compressed air, engine when the diameter of cylinder, length of stroke, absolute steam pressure—with valves wide open—are given, the stroke to be horizontal and the friction supposed to be zero. A. There is no formula for length of stroke, of any value, although some are given in published works. By a good engineer the length of stroke is determined by the character of the work to which it is to be applied.

(17) G. P. P. asks: 1. What kind of steel is best for a permanent magnet? A. A low grade of cast steel seems to answer best for this purpose. 2. In what proportion by weight is the powdered carbon and peroxide of manganese used in the porous vase of a Leclanche battery? A. About equal parts. 3. I have the impression that if a current of electricity be passed through chemically prepared paper, the paper will be turned blue; am I right? A. Yes. 4. How is the paper prepared, and what, and in what proportions, are the chemicals used? A. See p. 124 (24), current volume of SCIENTIFIC AMERICAN. 5. Is there any way of charging a Leyden jar directly from a galvanic battery? A. No; an induction coil must be used.

(18) G. D. writes: My friend says his microscope magnifies 300 times. I say mine magnifies 300 diameters. Assuming that these claims are correct, which is the more powerful instrument? A. If your microscope magnifies 300 diameters, it is equivalent to 90,000 times. Superficial magnification equals the square of linear magnification.

(19) W. S. P. asks: 1. What can I use on a marble imposing stone to harden it, so that it will not be so easily scratched? A. We know of no practical method of accomplishing this. 2. Is sulphur water injurious to steam boilers? A. Yes.

(20) J. K. T. writes: Please give botanical name of plant and commercial name of substance sold as "Persian insect powder"—I mean the powder used for destroying insects, etc. A. So-called "Persian insect powder" consists of the dried and powdered flowers of certain species of Pyrethrum—Pyrethrum carneum, P. roseum, and P. cinerariae folium. The last named is usually distinguished from the others commercially as Dalmatian powder, and is much more energetic than the others.

(21) M. A. M. writes: I wish to know where I am wrong in making the Japan ink after receipt in the SUPPLEMENT, No. 157? I have followed the receipt, but after using it awhile it will corrode the pen and will not flow freely. A. Use more borax or add a small quantity of soda. 2. What is soluble Prussian blue? A. Soluble Prussian blue is a commercial article and is used for laundry blue.

(22) R. B. asks: How long will a box made of galvanized iron, No. 18 gauge, filled with calcined plaster of Paris in liquid state, remain free from rust holes, or show signs of weakness—it of course being understood the box will have a tight cover on, and the plaster of Paris have the usual amount of sulphuric acid and lime in it? A. Soft water and ordinary plaster will have very little action on the metal. If sealed it would last indefinitely.

(23) H. T. S. asks: Do you know of any solution, acid, or composition, that will remove leading from a gun barrel without injuring the barrel? How can I remove rust from the inside of a gun barrel? A. The lead cannot be removed by chemical means. Gun makers usually supply a tool for mechanically cleaning the bore. The rust may be removed by means of emery flour and oil applied on a cloth wound on this tool.