

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 publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

Horizontal Steam Engines and Boilers of best construction. Atlantic Steam Engine Works, Brooklyn, N.Y.

Walrus Leather, Solid Walrus Wheels; Wood Wheels covered with walrus leather for polishing. Greene, Tweed & Co., 13 Park Place, New York.

Campbell's Self-acting Window Shade Rollers are the best in the market. Models and terms to the trade, 85 Centre St., New York.

Wanted—A Drill Press, a Bolt Forging and Heading Machine, and a Pulley Lathe, of some new and improved patent. Good second-hand machines might answer. Address Columbus Iron Works Company, Columbus, Ga.

Engines 1/2 to 5 H.P. Geo. F. Sheard, Waltham, Mass.

Linen Hose and Rubber Hose of all sizes, with or without coupling. Greene, Tweed & Co., New York.

For Sale—Two Windmill Patents, and set of patterns for same. None better. F. C. Maxwell, Columbus, O.

Wanted—A Machinist of experience, competent to superintend a large manufactory. Address, with references, in full, F. Case, Box 387 Cincinnati, O.

For Sale Low.—Horizontal Engines, 16 x 30, 10 x 36, 8 x 20, 7 x 23; Horizontal Tubular Boilers, two 3 1/2 x 15, one 3 x 13; 35 Horse Locomotive; 3 Horse Upright Engine with 5 Horse Boiler; all in good condition; new (Schenck) 14 inch Planer and Matcher. Belcher & Bagnall, 40 Cortlandt St., New York.

Small High Speed Steam Yachts complete or in parts. Geo. F. Sheard, Waltham, Mass.

Forsyth & Co., Manchester, N. H., & 213 Centre 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.

Wooden Pumps.—Makers please send circulars to Box 125, Moorestown, Bur Co., N. J.

Electrical Indicators for giving signal notice of extremes of pressure or temperature. Costs only \$30. Attached to any instrument. T. Shaw, 915 Ridge Ave. Phila.

The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 683 Broadway, New York.

The steam pipes, boilers, etc., in the buildings of the New York Tribune, New York Herald, and Harper & Bro., are protected with H. W. Johns' Asbestos Boiler Coverings. H. W. Johns Manufacturing Company, No. 87 Maiden Lane, sole manufacturers of genuine Asbestos Liquid Paints, Roofing, etc.

Partner Wanted.—See advertisement on inside page.

Wanted—Two good Machinists; one Plumber, who can do besides common machine work; two good Iron Moulders. Highest wages paid to good men. Address Mountain Foundry, Hazleton, Pa.

Models made to order. H. B. Morris, Ithaca, N. Y.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 61.

Wanted.—A Second-hand Turbine Wheel. Give price and dimensions. Address E. L. Pemberton, Fayetteville, N. C.

Instruction in Steam and Mechanical Engineering. A thorough practical education, and a desirable situation as soon as competent, can be obtained at the National Institute of Steam Engineering, Bridgeport, Conn. For particulars, send for pamphlet.

Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, borders, etc., etc., sent post free on receipt of \$2. Palm & Fechteler, 403 Broadway, New York city.

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

Launches and Engines. S. E. Harthan, Worcester, Mass.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 45.

The Baker Blower ventilates silver mines 2,000 feet deep. Wilbraham Bros., 2318 Frankford Ave., Phila., Pa.

To stop leaks in boiler tubes, use Quinn's Patent Ferrules. Address S. M. Co., So. Newmarket, N. H.

Nickel Plating.—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.

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.

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

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

Bradley's cushioned helve hammers. See illus. ad. p. 77.

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

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

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

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.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 61.

For Machine Knives and Parallel Vises, see advertisement, p. 61. Taylor, Stiles & Co., Riegelsville, N. J.

Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 205, Jersey City, N. J.

Inventors' Institute, Cooper Union. A permanent exhibition of inventions. Prospectus on application. 733 Broadway, N. Y.

Planing and Matching Machines, Band and Scroll Saws, Universal Wood-workers, Universal Hand Jointers, Shaping, Sand-papery Machines, etc., manuf'd by Bentel, Margedant & Co., Hamilton, Ohio. "Illustrated History of Progress made in Wood-working Machinery," sent free.

The Paragon School Desk and Garretson's Extension Table Slide manufactured by Buffalo Hardware Co.

Silent Injector, Blower, and Exhauster. See adv. p. 77.

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

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

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

For Superior Steam Heat. Appar., see adv., page 77.

For Pat. Quadruple Screw Power Press, see adv., p. 77.

All makes and sizes of Steam Hammers bored out. L. B. Flanders Machine Works, Philadelphia, Pa.

Millstone Dressing Machine. See adv., page 78.

Cut Gears for Models, etc. Models, working machinery, experimental work, manufacturing, etc., to order. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Holly System of Water Supply and Fire Protection for Cities and Villages. See advertisement in SCIENTIFIC AMERICAN of last week.

The E. Horton & Son Co., Windsor Locks, Conn., manufacture the Sweetland Improved Horton Chuck.

Forges, for Hand or Power, for all kinds of work. Address Keystone Portable Forge Co., Phila., Pa.

Power Hammers. P. S. Justice, Philadelphia, Pa. p. 77.

For Reliable Emery Wheels and Machines, address The Lehigh Valley Emery Wheel Co., Weissport, Pa.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 406.

Twin Injectors "Clipper" and "Ajax." "Acme" Governors, etc. Improved; new. Catalogue 1880, J. D. Lynde, Phila., Pa.

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

Wheels and Pinions, heavy and light, remarkably strong and durable. Especially suited for sugar mills and similar work. Circulars on application. Pittsburg Steel Casting Company, Pittsburg, Pa.

Deoxidized Bronze. Patent for machine and engine journals. Philadelphia Smelting Co., Phila., Pa.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 77. Totten & Co., Pittsg.

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



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) J. writes: I have a boiler that is good with the exception of about 4 inches at bottom of leg that is eaten badly by salt deposit. I have an idea of raising grate bars and filling with a cement of some kind. Can you inform me how to make it? A. Hydraulic cement, properly mixed, may answer your purpose.

(2) C. F. L. asks how tracing or vellum cloth is made. A. Wagner's tracing cloth is said to be prepared as follows: Boiled bleached linseed oil, 20 lb.; lead shavings, 1 lb.; zinc oxide, 5 lb.; Venetian turpentine, 1/2 lb.; boil for several hours, then strain, and dissolve in the strained composition 5 lb. white gum copal. Remove from the fire, and when partly cooled add purified oil of turpentine sufficient to bring to the proper consistency. Moisten the cloth thoroughly in benzole, and then give it a flowing coat of the varnish.

(3) G. writes: If a 10 lb. weight is dropped from the center masthead of a steamer running 16 knots per hour, what position would the steamer bear to the weight on its reaching the water? A claims that the time occupied by the falling of the weight will cause the steamer to be in advance of the weight's original position at the mast head in the steamer's center, said advance to be computed by the length of steamer and rate of her progress, due allowance being made for force of wind. B claims the weight will fall directly perpendicular, and when touching the water will be in its original position, due allowance being made for the force of wind. A. Neither is exactly right; the weight will strike the deck a very little aft of the perpendicular, as the vessel maintains a constant speed, whereas the weight has the speed of the vessel before dropping, but loses a very small fraction of that speed during the time of falling.

(4) C. M. K. asks: What will destroy or drive away fleas? A. Try pennyroyal or essence of pennyroyal.

(5) D. S. K. asks for directions for silver plating iron and steel. A. Dissolve 12 ounces cyanide of potassium and 1 ounce (troy) of chloride of silver in 1 gallon soft water; filter, and suspend in this bath the chemically clean work and a plate of pure silver, exposing a surface somewhat larger than that of the work. Connect the work with the negative or zinc pole of a

small Daniell or Smee battery of two or three cells by means of a stout copper wire, and join the silver plate in a similar manner with the positive pole of the battery. The work may be prepared for the bath by boiling it in a strong aqueous solution of caustic potassa or soda to remove traces of oil, rinsing in running water and scouring with a brush and pumice powder moistened with strong cyanide of potassium solution; then quickly rinsing again, and, without flogging, placing in the bath, and in circuit. A somewhat weaker (in silver) bath, called the "whitening" bath, and a stronger battery, is generally used to whiten or throw on the first film of silver. The proportions for this are: cyanide of potassium, 1 lb.; chloride of silver, 1/2 ounce (troy). If the silver runs on dark, use a weaker battery, or break the current so as to give alternate intervals of rest. 30 minutes ordinarily suffices when a battery of 3 or 4 Smee cells, plates 10 x 4 inches, are used. In the whitening process an additional cell or more is employed. Iron takes silver better after having received a light deposit of copper. The metal must be freed from oxide by pickling in dilute acid and scouring with sand. For coppering a slightly acid bath of the sulphate and a strong battery may be used.

(6) "Reader" asks: Has chromic acid much application in the arts, where manufactured, and what its probable price? A. Yes, several of our large Philadelphia houses now produce the acid. It is quoted at 20 cents per ounce. 2. Can murlatic acid gas be made to combine with turpentine by the aid of heat, or at ordinary temperature without aid of a freezing mixture? A. Turpentine oil forms several compounds with hydrochloric acid. The gaseous acid converts it into the monohydrochloride, C₁₀H₁₆·HCl; when the oil is subjected for several weeks to the action of the strong aqueous acid, crystals of the dihydrochloride C₁₀H₁₆·2HCl are obtained. The latter compound is also formed by the action of hydrochloric acid on lemon oil; hence it is called citrene dihydrochloride.

(7) H. H. K. asks how to clean and crystallize the blue vitriol which is found in the bottom of dip jars. A. Dissolve in small quantity of hot water, cool slowly, and evaporate by exposure to the air.

(8) F. W. D. writes: 1. Will you please inform an amateur photographer of the easiest way to recover the silver from waste solutions. 2. If it harms or benefits the silver bath to leave it in the sunlight? A. 1. Precipitate the warm solution by addition to it of common salt; allow it to settle, decant the clear liquid, and throw the precipitate, together with several scraps of zinc, into warm dilute sulphuric acid. When the chloride is all reduced, pick out the remainder of the zinc, decant and press out the liquid from the precipitate, dry, mix it with a little borax, glass, and powdered resin in a small clay crucible, and heat to complete fusion. Cool and break the crucible; the silver will be found as a button in the bottom. With a small crucible, a good fire in an ordinary cooking stove will answer for the fusion. 2. If covered, it is beneficial.

(9) A. R. F. asks: Can I get any more power from an undershot water wheel fitted with appliances to keep the paddles vertical than I can with a common stayed undershot of the same dimensions? If so, how much? A. You can, if the arrangements are suitable to the course of the current. The amount of gain will depend very much upon such arrangements.

(10) C. R. B. asks how to tin iron castings. A. Small articles of cast iron may be tinned by wrapping them loosely with zinc wire and immersing in a solution of perchloride of tin in 10 parts of soft water for 15 minutes. The castings must of course be well cleaned, by picking them in dilute sulphuric acid and scouring with sand and water or scratch brushing. Use the bath at ordinary temperatures and polish the tinned goods with whiting and the brush. 2. Can you give me any information on soluble glass? A. Consult Fechtwanger's treatise on Water Glass and its uses.

(11) W. A. C. asks if there is a cheap process by which pine poles can be prepared for service as telegraph poles, something that would preserve them in the ground a reasonable length of time? A. Char the ends slightly and coat them thickly with wood tar.

(12) W. J. R. asks: Please answer the following in your paper. Can I build a cemented wall in water; if so, how? Machinery to pump the water out would be too costly. A. Yes, by using a diving bell.

(13) F. X. M. asks: 1. How can I preserve cider? A. See p. 81, Vol. 41, SCIENTIFIC AMERICAN. "How to Preserve Cider." 2. A stick of wood weighing 100 lb., when converted into charcoal will be very much lighter, say 60 lb. less, and yet will give a much greater amount of heat. What is the chemical process and what change has taken place? What was the 60 lb. (missing from the original) composed of which would seem lost? A. Your assumption that the combustion of 40 lb. charcoal develop more heat than 100 lb. dry wood is erroneous. In comparing equal weights of the combustibles, the available thermal value of charcoal is greater, as wood contains more or less water, incombustible nitrogenous compounds, and volatile combustible matters which escape complete combustion in ordinary furnaces. Consult some elementary work on chemistry and heat.

(14) F. G. asks for a receipt for making black marking ink for boxes, bales, etc. I am familiar with the japan and turpentine preparation, but desire, if possible, an ink that will flow free from the brush and not become gummy. A. Try nigrosine dissolved in boiling water.

(15) P. E. writes: I wish to protect young pear and apple trees against gnawing by rabbits, by the use of lime whitewash; but it washes off the smooth bark so rapidly by rain that it becomes impracticable. Can you tell me any addition to make to the wash that will make it adhere in wet weather? A. Try mixing a small quantity of water glass solution (20 per cent) with your lime. Wash and moisten the wood with alum water before coating.

(16) W. T. S. asks: 1. Is there as much or any more pressure at the top of a steam boiler than at the bottom? I would suppose that the most would be at the bottom on account of the weight of water and steam pressure also. Am I right? A. You are right. 2.

Can you explain why an injector throws water into a boiler against the pressure? Because the momentum of the water driven by the steam at a high velocity is superior to the pressure on the valve. 3. Is an inch and one fourth steam pipe large enough to supply a seven and a half by ten engine, running from four to five hundred revolutions per minute? A. No; it should be 2 inches diameter, if the engine runs at usual speed.

(17) M. J. asks: What will remove fruit and wine stains (especially peach and claret) from table linen? A. If uncolored, moisten with dilute sulphuric acid and then rub with a strong aqueous solution of sulphite or hyposulphite of soda; or soak for a short time in a strong aqueous solution of bleaching powder (calcium hypochlorite), press out excess of the liquid, and immerse in dilute sulphuric acid (1 to 10 of water); rinse in cold water, dip in hyposulphite of soda solution, and afterwards wash out thoroughly in hot water. If colored, use plenty of soapsuds and ammonia water. See p. 2511 SCIENTIFIC AMERICAN SUPPLEMENT, No. 158.

(18) J. E. E. writes: 1. I am intending to build a steam saw mill, 45 horse power. I wish to set the engine 60 feet from the river and 10 feet above the water line. Will I be likely to have any trouble in supplying the engine with water through the pump at that distance? A. Not if your pipes are carefully laid and tight. 2. There is an idea prevalent among engineers here that an engine whose cylinder diameter is 2-3 the stroke is better for saw mills than one whose diameter is 1/2 the stroke, or that a 12x16 is a better proportion than 9x18. Are they correct? A. Ordinarily cylinder 1/2 the stroke is best. The losses from waste spaces and clearances is less.

(19) J. A. W. asks which is properly the front end of an ordinary stationary engine, the crank end or the cylinder end. A. The cylinder end is usually considered the front, whether it be a beam or horizontal engine.

(20) J. H. D. writes: I am building a light draught side wheel boat, 65 feet long, 15 feet beam, making over all 22 feet, to be propelled by 10 foot paddle wheels making 50 revolutions per minute, paddles to be 26 inches long and 10 inches dip. How many paddles would it be advisable to put on each wheel? A. Not less than 10 nor more than 12. The latter will work the smoothest.

(21) E. B. D. asks: What is the cheapest and strongest battery or electric pile you know of? A. The Grenet is cheap and strong, but not constant. You do not state how you intend to use it.

(22) C. B. C. asks whether an induction coil could be made without commutator or condenser, that would give perceptible shocks, using three or four of the large sized cells of battery described in SUPPLEMENT 149. A. A condenser is not required for a coil used for giving shocks, but some kind of an interrupter must be used in the primary circuit.

(23) S. S. D. writes: I am going to try to make an emery wheel for grinding skates, etc. What grade of emery should I get, and what should I mix with it, and how mix? A. You will hardly succeed in making a regular solid emery wheel without expensive moulds and many trials and failures. You may, however, make a serviceable emery wheel in the following way: Turn a wheel of the desired shape from a well seasoned piece of pine board. Heat some emery on an iron plate to 200° Fah., and coat your wheel with good glue of about the consistency used for wood work; roll it in the emery and allow it to dry, then give it another coating of glue and emery. When it becomes thoroughly dry it is ready for use. You should make several wheels of different grades.

(24) C. S. asks (1) how the article in No. 161 of the SCIENTIFIC AMERICAN SUPPLEMENT, about a dynamo-electric machine, is to be understood. I mean that portion describing the electro-magnet. It says there: It is not necessary to use permanent magnets. Electro-magnets may be employed, the slight residual magnetism of the soft iron cores serving to excite the armature. Now how can I make this soft iron core to be magnetic, or must the armature be a magnet? A. Temporarily connect the wires that surround it with a battery; or place it in the magnetic meridian, that is, with one pole toward the north and the other toward the south. It is hardly necessary to resort to either of these expedients, as it is almost impossible to find a piece of cast iron that is not in some degree magnetic. 2. Also please give me the title of some book on such machines; one giving experiments that may be tried with it. A. An elementary work on physics would meet your wants. Ganot's Physics is a good work for you.

(25) S. M. E. asks: 1. What effect will ozonized air have on gelatinous animal substances in course of their manufacture? Will it bleach, purify, and deodorize them? A. It would probably bleach and deodorize them to some extent. 2. Is process practicable? A. We have no record of any experiments in this line. Without a better generator of ozones (ozonifer) than any at present used, probably not. 3. Are fish scales utilized in the preparation of isinglass; if not, by what process can they be practically converted into gelatin in quantities? A. No; it remains to be devised. 4. What books give reliable information as to the various manufactures of gelatin, glue, isinglass, and preparation of hair (from cattle) for mattresses, etc.? A. Consult Dawidowstz's Leim und Gelatin Fabrication.

(26) S. L. H. writes: I was in an assayer's office this morning and saw brought in by a miner something that he thought was very valuable, but it proved to be a mass of iron. Its greatest dimensions over all were: length 13 inches, width 10 inches, thickness 8 inches, weight 130 lb. It seems to be about the quality of best Norway iron, shows regular lamination across the mass, and has the appearance of having been thrown while at a welding heat into a bed of coarse gravel, and is not magnetic. I inclose a fragment chipped from it. It is very tough and would make good horse nails. Is this meteoric iron, or what is it, and are such things common? It was picked up about 8 miles from the Ivanpole gold and silver mines in the northern part of this county. [Judging from the small fragment sent us it is undoubtedly of meteoric