

## 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.*

Cope & Maxwell Mfg. Co.'s Pump adv., page 188.  
The American Electric Co., Proprietors of the Thompson-Houston System of Electric Lighting the Arc Type. See adv., page 189.  
Foot Power Printing Press; Chase, 8 x 10; Price, \$65. I. W. Colburn, Fitchburg, Mass.  
The New System of Bee Keeping. Every one who has a farm or garden can now keep bees with pleasure and profit. For particulars address Mrs. Lizzie E. Cotton, West Gorham, Maine.  
N. C. Baughman's Climax Wash. Mach. See adv., p. 188.  
For the Cheapest Process of Manufacturing Bricks, see Chambers Bros. & Co.'s adv., page 190.  
Rowland's Vertical Engine. Wearing parts of steel. Broad bearings. F. C. & A. E. Rowland, New Haven, Conn.  
50 cents each will be paid for the following numbers of London *Engineering*. Jan. 14, 28, and Feb. 18, 1876; Sept. 14, 1877. B. R. Western, No. 8 Broad St., N. Y.  
Boomer & Boschert's Cider Press will perform better work and produce more cider from the same quantity of apples than any other press in the world. Farmers and others interested, send for illustrated circulars to the New York Office, 15 Park Row.  
Any one having a first-class Sewing Machine, well protected by patents, can find a responsible party to make on royalty or purchase patents, by addressing "Advertiser," Box 773, New York.  
See Special Bolt Forging Machine Notice, page 204.  
Blake's Belt Studs are better than lacing or any other fastening for belts. Greene, Tweed & Co., New York.  
The New York Assay Laboratory.—Short, practical courses of instruction in Iron Chemistry and Assaying of Ores. Send for circular. Thos. B. Stillman & Co., 40 Broadway, N. Y.  
Gear Wheels for Models (list free); Models, Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Philadelphia, Pa.  
R. J. W.—Froth or scum in your boilers caused by sediment in water from driven wells, entirely obviated without loss of water, by Hotchkiss' Mechanical Boiler Cleaner. Send for circular. 84 John St., New York.  
Telephone and Call Bell, complete set, only \$3. Model Novelty Co., Boonton, N. J.  
For Machinists' Tools, see Whitcomb's adv., p. 173.  
For Light Machinists' Tools, etc., see Reed's adv., p. 156.  
Large Slotter, 72" x 18" stroke. Photo on application. Machinery Exchange, 261 N. 3d St., Phila.  
Buy the Buffalo Port. Forge. Have no other.  
Presses, Dies, and Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, successor to Bliss & Williams, Brooklyn, N. Y.  
L. Martin & Co., manufacturers of Lampblack and Pulp Mortar-black, 226 Walnut St., Philadelphia, Pa.  
Send to John D. Leveridge, 3 Cortlandt 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.  
Pure Oak Lea Belting. C. W. Army & Son, Manufacturers, Philadelphia. Correspondence solicited.  
Star Glue and Pure Turkey Emery for Polishers. Greene, Tweed & Co., 18 Chambers St., New York.  
Within the last ten years greater improvements have been made in mowing machines than any other agricultural implement. It is universally acknowledged that the Eureka Mower Co., of Towanda, Pa., are making the best mower now in use, and every farmer should write to the manufacturers for catalogue, with prices.  
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. Cordesman, Egan & Co., Cincinnati, O.  
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.  
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.  
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.  
Wren's Patent Grate Bar. See adv. page 173.  
Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsburg, Pa.  
Eclipse Portable Engine. See illustrated adv., p. 158.  
Best Oak Tanned Leather Belting. Wm. F. Forrepaugh, Jr., & Bros., 531 Jefferson St., Philadelphia, Pa.  
Slave, Barrel, Keg, and Hoghead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.  
4 to 40 H. P. Steam Engines. See adv. p. 158.  
Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 158.  
Wright's Patent Steam Engine, with automatic cut off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.  
The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.  
Saunders' Pipe Cutting Threading Mach. See p. 173.  
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.  
Saw Mill Machinery. Stearns Mfg. Co. See p. 141.  
Clark Rubber Wheels adv. See page 172.  
For Mill Mach'y & Mill Furnishing, see illus. adv. p. 172.  
See Bentel, Margedant & Co.'s adv., page 188.

For Sale.—Two New 66-inch Stevenson Turbine Wheels composition buckets; 200 H. P.; price, \$1,500. Continental Works, Greenpoint, Brooklyn, N. Y.  
Diamond Saws. J. Dickinson, 64 Nassau St., N. Y.  
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.  
Peerless Colors—For coloring mortar. French, Richards & Co., 40 Callowhill St., Philadelphia, Pa.  
For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 185.  
Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 188.  
Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. L. S. Graves & Son, Rochester, N. Y.  
For the manufacture of metallic shells, cups, ferrules, blanks, and any and all kinds of small press and stamped work in copper, brass, zinc, iron, or tin, address C. J. Godfrey & Son, Union City, Conn. The manufacture of small wares, notions, and novelties in the above line, a specialty. See advertisement on page 188.  
For Heavy Punches, etc., see illustrated advertisement of Lilles & Jones, on page 188.  
Comb'd Punch & Shears; Universal Lathe Chucks. Lambertville Iron Works, Lambertville, N. J. See ad. p. 189.  
Best Band Saw Blades. See last week's adv., p. 189.  
Reed's Sectional Covering for steam surfaces; any one can apply it; can be removed and replaced without injury. J. A. Locke, & Son, 40 Cortlandt St., N. Y.  
Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 189.  
For best low price Planer and Match, and latest improved Sash, Door, and Blind Machinery, send for catalogue to Rowley & Hermance, Williamsport, Pa.  
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.  
Penfield (Pulley) Blocks, Lockport, N. Y. See ad. p. 189.  
Tyson Vase Engine, small motor, 1-33 H. P.; efficient and non-explosive; price \$50. See illus. adv., page 188.  
Use Vacuum Oil Co.'s Lubricating Oil, Rochester, N. Y.  
For Thrashing Machines, Engines, and Horse Powers, see illus. adv. of G. Westinghouse & Co., page 189.

## 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.

(1) E. S. M. writes: I am about to build a steam velocipede of three wheels of about 4 feet in diameter. Would we have more power to have the piston rod connected right to the back axle? A. No. 2. Would it be best to have one or two cylinders, and what size to carry three persons? A. Two, about 2½ inches diameter by 4 inch stroke. 3. The size of boiler, and of what material? To be plain or tubular? A. Tubular. Size depends on speed and weight of vehicle. 4. Can that be heated by lamps, or would it be best of coal or wood? A. Coal or mineral oil or coke.

(2) J. H. P. writes: 1. I want a cheap cement for uniting half-inch lead pipe that will last six months and stand a water pressure of six feet? A. Join the pipe with a piece of stout canvas or duck smeared with red lead in oil, wrapped several times about the joint and bound with copper wire. 2. What is the purport of the term "limited" as applied to a firm or company? A. The term limited signifies a limitation of the individual responsibility of members of a firm or company.

(3) F. & S. ask: What is dynamite, and how is it made? A. The name was originally applied by Nobel to a preparation of infusorial silica partially saturated with nitroglycerine. Other earths and gunpowder mixed with nitroglycerine are now frequently classed under the same name. Consult Mowbray's "Trinitroglycerin."

(4) J. H. N. writes: We have exhausted part of the steam from our engine into the cistern that catches the rain water. Examination shows that the cement has all scaled off and the cistern is worthless. I am told that this result always follows such treatment, also that no cement exists that will make the cistern tight if steam is admitted. Would like to learn through the columns of the SCIENTIFIC AMERICAN, if with such management a cement is known that will cause the cistern to hold water, or is our only course to line it up with wood or iron? A. Few cements applied will retain their integrity under such conditions for any length of time owing to the excessive alterations of temperature and the action of the steam and heated water. Better board up the cistern, or better line it with iron.

(5) E. M. T. writes: 1. I want thorough light on the subject of "luminous paint." A. Experiments in the manufacture of luminous paint have not

proved successful in this country so far. We believe the imported article is now for sale by some of our dealers in colors. See our advertising columns. 2. I want to bleach thin sheets of wood quickly and cheaply. A. Scour lightly with hot solution of caustic soda, rinse, submit to a strong bath of chloride of lime (calcium hypochlorite) in cold water, then to a dilute solution of oxalic acid. Repeat the two last if necessary, rinse, and dry.

(6) J. M. writes: In answer to inquirer, 21, in your paper of March 5, I would say that refined benzine will dissolve the disagreeable odoriferous oily substance which is secreted from some people's skin. After which plenty of soap and water will remove it. This persevered in will make the skin inodorous.

(7) P. Y. asks: What ingredients are required to make mirror glass and how to prepare them? A. The proportions are as follows: Finest white quartz sand, 720 parts; best soda, 450; lime, 80; niter, 25; cullet (broken plate glass), 425. Powder, mix, and heat in the crucible for 48 hours.

(8) J. H. W. asks: What is the best preparation used to produce a polish on bone and horn and give a glossy appearance, and how applied? A. First use finely ground pumice stone and water, applied with a felt polishing wheel; finish with rotten stone applied in the same way.

(9) L. A. asks for a receipt for stove polish paste as known under various names in trade: Russian, Acme, American, stove paste polish. A. Reduce graphite (blacklead) to an impalpable powder by grinding in a mill with a little water, and dry. In using moisten with water first, and finish with the dry powder.

(10) E. G. A. asks: Is there any chemical process or other mode of extracting the dextrine or sap from green lumber? A. Boil in a solution of 1 lb. caustic soda to the gallon of water.

(11) J. H. K. writes: Myself with some others have need to use some blue colored fire for outdoor use, but cannot obtain a good blue color; it has a whitish shade. Could you give me a receipt for making a good color? A. Blue fires: 1. Sulphur, sulphate of potassa, and ammonio-sulphate of copper, each 15 parts; niter, 27; chlorate of potassa, 28. 2. Niter, 5; sulphur, 2; metallic antimony, 1. 3. Fine gunpowder, 4 parts; sulphur and metallic zinc, each 3 parts; niter, 2 parts. 4. Nitrate of baryta, 77 parts; sulphur, 13; chlorate of potassa, 5; charcoal, 3; realgar (sulphide of arsenic) 2 parts. 5. Chlorate of potassa, 69 parts; sulphur, 24; sulphate of copper, 7. 6. Black sulphide of antimony, 4 parts; niter, 12; sulphur, 16; charcoal and orpiment (sulphide of arsenic) ¼ part. The purity of the color of these fires depends very much upon the care bestowed in drying and powdering each ingredient and in mixing the prepared substances.

(12) M. M. asks: What is the action of arsenic in the human system? What are the symptoms of arsenical poisoning, and how large a quantity is required to produce fatal results? A. "Arsenic is a non-accumulative irritant poison, and exerts no decided chemical or corrosive action on the tissues." (Taylor.) Its action is to inordinately increase the secretions and diminish the contractility of the voluntary muscles. The symptoms vary according to the form and dose in which the poison has been administered. The average time at which they appear is generally from half an hour to an hour after the poison has been taken. It produces at first a nameless feeling of illness, failure of strength, and aversion to eat or drink, followed by nausea and intense burning pain in the region of the stomach increased by pressure. These symptoms are soon followed by retching, vomiting, sense of constriction in the throat with intense thirst; diarrhea, more or less violent, accompanied by severe cramps in the calves of the legs; matter discharged from the stomach dark greenish or yellow, sometimes streaked with blood. There is tenesmus and sometimes excoriation of the anus; pulse small, very frequent, and irregular; skin cold and clammy in the stage of collapse, at other times very hot; respiration painful; eyes red and very bright; sometimes coma supervenes, with paralysis and tetanic convulsions, precursors of death. 2½ grains have caused death.

(13) D. F. C. asks: Can I melt zinc clippings in an iron ladle over a coal fire? I want to cast zinc plate for a battery. What kind of mould should be used? A. You can readily melt zinc clippings in the way you propose. A sand mould will answer, but a metal mould would be better.

(14) C. D. M. asks: 1. Please describe a practical mode of electro-engraving. A. Clean the polished plate thoroughly, warm it slightly, and give it in the dark a flowing coat of the following solution: Fine gelatine, 5; isinglass, 5; bichromate of ammonia, 1½; water, 200; mix and dissolve by aid of heat over a water bath. When dry, cover with a glass photographic positive (strong), of the reduced design (in limework), and expose to sunlight for about 20 minutes. Remove to a dark room, take off the glass, and put the plate in water, first warm, then hot, change the water several times; then connect the plate by means of copper wire with the carbon pole of a moderately strong bichromate battery, the other pole of which is joined to a large copper plate. Immerse both plates in sulphuric acid diluted with three volumes of water until the prepared plate is properly engraved. Clean in a hot caustic potash dip. 2. Why will not a silver coin do for the anode in a silver-plating solution? A. Because it is not pure silver. 3. Please give a good method of gold plating. A. See article on electro-metallurgy, gold deposits, page 116, current volume. 4. In plating gold on silver is it necessary to first wash the silver with any solution to make the gold adhere firmly? A. No. 5. To obtain a brilliant polish is it necessary to use greater intensity in silver plating? A. See article on electro-metallurgy, silver deposits, page 81, current volume. 6. In the electric light should Grenet or Fuller batteries be coupled for intensity or quantity? A. Intensity.

(15) C. P. K. writes: 1. I have a yacht, hull 58 feet long, 13 feet beam, and 7 feet depth of hold, moulded. Will two 36-inch wheels (propellers) run it 22

miles an hour, and what size engines necessary to do so? A. No. We doubt if any power you could put in, would drive it 22 miles per hour. 2. I have a double cylinder engine, bore 8 inches and stroke 8 inches, running at 300 revolutions per minute. Is the engine too large? Wish to make the boat as fast as possible, without regard as to cost of running it. A. A pair of 8 inch by 8 inch engines would be too small for high speed, but a very fair speed could be obtained (with good model) by carrying 140 or 150 lb. steam, and running 300 revolutions per minute. 3. Is there an electric machine described in SCIENTIFIC that will run 15 of Edison's electric burners, and if so, in what number? A. Edison's generator, described on pp. 239 and 243, vol. xli., SCIENTIFIC AMERICAN, would answer your purpose. No detailed description of his later machine has been published. 4. Would an engine, 3 inch stroke and 3 inch bore, run the machine described in SUPPLEMENT, No. 161, if it were enlarged four times, and, if not, what sized engine would it take, to attach it direct? Or in other words how much must the machine be enlarged to run 15 of the above named lamps, and what sized engine? A. This machine is not adapted to the Edison light. An engine of the size given would run a machine of this kind three or four times as large as the one described in the SUPPLEMENT.

(16) C. H. asks: 1. How can I make a gallon of nickel plating solution? How is copper and brass prepared or cleaned before plating? How is iron prepared before plating so as to make the nickel plating adhere? A. See article on nickel plating, page 153, vol. xliii., SCIENTIFIC AMERICAN. 2. How is nickel "stripped" from articles that are to be replated? A. Use nitric acid diluted with half its volume of water. 3. What is a simple test to find out whether an article is silver or nickel plated? A. Nickel and silver can easily be distinguished by their appearance. 4. Will coin nickel answer the purpose of making solutions and anode? A. No. 5. What kind of battery is the best suited for plating small objects such as binding screws, medals, and thimbles? A. One of the modifications of Bunsen's battery. 6. In making the mercurial air pump described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 224, vol. ix., will it affect the working of the pump if the glass tubes are made a few inches longer or shorter? A. Yes, the lengths given are correct.

(17) R. J. W. asks (1) how gold leaf on frames is burnished. A. The burnishers used by the frame gilder are either of flint or agate, generally the former. They are made of various sizes and shapes to suit the work. These are passed lightly over the gilded and dry work until properly burnished. It is then usually given a thin coat of very weak clear size. Frame gilding requires much practical experience to do properly. 2. What kind of varnish is put on silver leaf to make it appear like gold? A. Dissolve, by digestion, fine pale shellac in alcohol, and color with turmeric and dragon's blood.

(18) C. P. F. writes: The rise in coal in the river towns from \$4.50 to \$9 a ton, has made it a matter of general interest as to the respective value of coal and wood for steaming purposes. The books give from 1 to 1½ cords as the equal of 2000 lb. coal, but the engine users say it takes 1½ to 1¾ cords wood to produce the effect of a ton (2,000 lb.) of coal. A. Experiment has shown that in practice 1½ cords pine wood equals 1 ton of coal (2,240 lb.), but this can only be considered approximate, as very much depends upon the character and condition of the wood.

(19) G. H. S. asks how to produce prismatic colors on brass buttons like sample sent. A. The button is brass; it has been thinly coated with a dilute hard gum lacquer to which has been added a sufficient quantity of fuchsine, and when half dry momentarily dipped in alcohol, quickly dried, and thinly washed with uncolored lacquer.

(20) C. B. T. asks: 1. What is the horse power of an engine with a 1½ inch bore and 2½ inch stroke, making 200 revolutions per minute? A. See rule for calculating the horse power of engines in SUPPLEMENT, No. 253. 2. What size fly wheel would you put on an engine of the above dimensions and what weight? A. About 12 or 14 inches diameter and 50 or 60 lb. weight.

(21) D. M. writes: In a brook over which I pass I notice that where there is a strong current the ice forms on the bottom. The depth of water is from four to six inches. Can you explain this? A. The ice you allude to is what is termed anchor ice. The stream being shallow, the water is the same temperature the entire depth, and while the surface current prevents freezing at the top, the more quiet waters below freeze and the ice attaches to rocks and stones, thus preventing it from rising to the surface.

(22) H. C. P. asks: Will water run down hill through a one and a quarter inch pipe, the angle to be 45° to 20°, for half a mile, provided of course the supply to be plenty? A. Yes.

(23) A. J. A. asks: 1. What is sailing distance made by the Cunarders between Boston and Europe? A. Boston to Queenstown, 2,668 nautical miles. 2. And also between New York and Europe? A. New York to Queenstown, 2,798 nautical miles; Queenstown to Liverpool 248 nautical miles. 3. What is the quickest recorded time? A. Arizona, 7 days 8 hours and 8 minutes, July, 1879. 4. What is the sailing distance between San Francisco and Sandwich Islands? A. San Francisco to Sandwich Islands, 2,680 nautical miles.

(24) C. K. S. writes: 1. I am making a fifteen dollar canoe according to the directions given in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 39. Will you please answer the following questions: I have heard it said that the heaviest cotton drilling, well oiled, would answer exceedingly well for the sides of a canoe. Is it so? A. Yes. 2. If I use cotton drilling or canvas which way must I put the canvas: in one piece, that is, so the length of the piece of canvas goes the way of the length of the boat; that is from stem to stern, or in breadth across the boat? A. Lengthwise. 3. Could not a paddle be used instead of sculls, and if so, how long would a double paddle have to be? A. Yes; it must be of such length as you can conveniently handle, if you wish to use it standing; it must be longer than if used sitting.