

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.

Railroad and Machine Shop Equipment. Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

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

Scientific Books. See page 44. 100 page Catalogue free. E. & F. N. Spon, 44 Murray Street, N. Y.

For press copy, printers delight in a plain open hand. Esterbrook's blunt and engraving pens are excellent for this purpose.

I want to find a novelty in art materials, mailable and easily prepared, to advertise as a specialty. F. A. Whitling, Wellesley Hills, Mass.

Drop Forgings. Billings & Spencer Co. See adv., p. 45.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Millstone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau street, New York.

50,000 Emerson's Hand Book of Saws. New Edition. Free. Address Emerson, Smith & Co., Beaver Falls, Pa. Eagle Anvils, 10 cents per pound. Fully warranted.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 44. Gould & Eberhardt's Machinists' Tools. See adv., p. 44.

Pure Grain Nickel, Rolled and Cast Anodes, Pure Nickel Salts. Greene, Tweed & Co., 118 Chambers St., New York.

For Heavy Punches, etc., see illustrated advertisement of Miles & Jones, on page 44.

Barrel, Key, Hoghead, Stave Mach'y. See adv. p. 44.

Magic Lanterns and Stereopticons of all kinds and prices. Views illustrating every subject for public exhibitions, Sunday schools, colleges, and home entertainment. 116 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., New York.

Cutlery for Teeth of Gear Wheels formed entirely by machinery. The Pratt & Whitney Co. Hartford, Conn.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 46.

Catechism of the Locomotive. 635 pages, 250 engravings. Most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for catalogue of railroad books. The Railroad Gazette, 73 B'way, N.Y.

For best low price Planer and Matchner, and latest Improved Sash, Door, and Bini Machinery, Send for catalogue to Rowley & Herman, Williamsport, Pa.

Improved Skinner Portable Engines. Erie, Pa.

The Porter-Allen High Speed Steam Engine. Southwork Foundry & Mach. Co., 490 Washington Ave., Phil. Pa. Peck's Patent Drop Press. See adv., page 44.

Common Sense Dry Kiln. Adapted to drying of all material where kiln, etc., drying houses are used. See p. 22.

Contracts taken to Manuf. small goods in sheet or cast brass, steel, or iron. Estimates given on receipt of model. H. C. Goodrich, 66 to 72 Ogden Place, Chicago.

See New American File Co.'s Advertisement, p. 30.

Steam Pumps. See adv. Smith, Yalle & Co., p. 29.

Stone bottles for beer and ink. Merrill & Co., Akron, O.

25' Lathes of the best design. G. A. Ohl & Co., East Newark, N. J.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

"How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 84 John St., New York.

Engines, 10 to 50 horse power, complete, with governor, \$250 to \$350. Satisfaction guaranteed. More than seven hundred in use. For circular address Heald & Morris (Drawer 127), Baldwinville, N. Y.

Brass Finishers' Turret Lathes, 13 1/2 x 4, \$165. Lodge, Barker & Co., 189 Pearl St., Cincinnati, O.

Wanted.—Patented articles or machinery to make and introduce. Gaynor & Fitzgerald, New Haven, Conn.

Latest Improved Diamond Drills. Send for circular to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill.

Water purified for all purposes, from household supplies to those of largest cities, by the improved filters manufactured by the Newark Filtering Co., 177 Commerce St., Newark, N. J.

Assays and Analyses of ores and all commercial products. Advice given and investigations made in all branches of chemical industry. Send for circular. N. Y. Assay Laboratory, 40 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description.

Combination Roll and Rubber Co., 68 Warren street, N. Y. Wringer Rolls and Moulded Goods Specialties.

First Class Engine Lathes, 30 inch swing, 8 foot bed, now ready. F. C. & A. E. Rowland, New Haven, Conn.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3033, New York City.

Steel Stamps and Pattern Letters. The best made. J. F. W. Dorman, 21 German St., Baltimore. Catalogue free.

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

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y.

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

Cope & Maxwell M'f'g Co.'s Pump adv., page 12.

Curtis Regulator, Float, and Expansion Trap. See p. 12.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 14.

The Sweetland Chuck. See illus. adv., p. 14.

Knives for Woodworking Machinery. Bookbinders, and Paper Mills. Taylor, Stiles & Co., Eglestonville, N. J.

Lace Cutters. A useful little tool for cutting lace leather without waste. Greene, Tweed & Co., New York. The Curtis Pressure Regulator and Curtis Steam Trap. See page 12.

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.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) C. & B. ask for a formula for coppering malleable iron; also let us know what to use for cleansing iron before coppering. We would like a nice bright color, such as curtain fixtures. A. See SUPPLEMENT, No. 310, where full instructions are published under the head of "Electro-metallurgy."

(2) A. C. asks what to use with paraffine to make it the consistency of a gum. I have tried several experiments, but as yet can get nothing that will mix with it. A. We recommend that the paraffine be dissolved in some menstruum until the desired consistency is obtained. Use some agent like benzol. Paraffine is also soluble in some of the lighter petroleum oils.

(3) H. P. writes: Two ordinary suction pumps, each 3 inches in diameter, are placed side by side; the rod of one is one-half inch, the other 2 inches in diameter. With the same amount of time and labor, which pump will throw the greatest amount of water? A. There will be no difference.

(4) C. G. R. asks: 1. Do the nickel anodes commonly used for plating contain any iron? If so, about what per cent? A. The nickel anodes are generally very pure. They contain, probably, not 1 percent of iron. 2. In electroplating, if the anode contains iron, will the iron be transferred with the nickel, or remain in the anode as waste? A. In electroplating, the iron is separated out. 3. Can iron be deposited by the electroplating process? A. Iron can be deposited by the electrolysis. See SCIENTIFIC AMERICAN SUPPLEMENT for June 19, 1880; also for October 21, 1882. 4. Does a good nickel plate contain any iron? If so, is it enough to cause rust? A. A good nickel plate does not contain any iron.

(5) H. B. asks: 1. Will the dynamo-electric machine described in SUPPLEMENT, No. 161, generate sufficient electricity to keep one light burning? A. It will run two 3-candle lamps. 2. What is the cost of an Edison, or any other make, lamp? A. We believe they are sold only with a complete illuminating plant. 3. Will a power which is sufficient to run a sewing machine with ease be powerful enough to rotate the dynamo mentioned above? A. No.

(6) T. B. C. writes: Will you oblige by giving simple recipe for painting or washing brick walls red? I want a wash that will not wash off. A. Use oil paints, or add to the usual mixture some glue and bicarbonate of potassium.

(7) F. J. M. asks: Will you inform me of the best composition substitute for ivory? A. Use celluloid. See SCIENTIFIC AMERICAN, July 23, 1881.

(8) J. S. asks how to tell if buckwheat flour is adulterated with plaster of Paris or anything else. I bought some for the best Pennsylvania buckwheat flour, but it has a peculiar smell and taste. Would like to know how to test its purity. A. Mix about a thimbleful of it in a pint of water in a glass, stir it thoroughly, and when in suspension for a few seconds pour off most of the suspended matter, and the mineral impurities will be found on the bottom of the glass, feeling gritty when rubbed with a spoon or other implement. If the sediment is considerable, the flour may be considered to have been adulterated.

(9) J. V. S. asks: What is the best protection for a wire rope—something to preserve the rope, a protection against wet, to keep it from rusting, and that will also render it pliable and that will add to its durability? I have been using pine tar, but it does not render satisfaction as it pulls off on the drums and rollers. The rope I am using is an endless rope, one and a half miles in length, used for hauling coal. A. To preserve wire rope apply raw linseed oil with a piece of sheepskin, wool inside; or mix the oil with equal parts of Spanish brown and lamp black. To preserve wire rope underwater or underground, take mineral or vegetable tar, add one bushel of fresh slaked lime to one barrel of tar, which will neutralize the acid; boil it well, then saturate the rope with boiling tar.

(10) J. R. M. writes: I have a cistern lined with brick laid in cement and then plastered with cement. The water tastes too much of lime to use. Is there any way to take the lime out except to soak and then pump out water, and let it refill? A. The best plan is to bear it. The cistern can be emptied, and the sides

coated with either asphalt or soluble glass. In this instance it is probable that for a while a tarry odor and taste would pervade the water; and if soluble glass was used, unless of proper degree of neutrality, the tendency would be that the water would dissolve out some of the alkali, which would impart a disagreeable taste to the water.

(11) L. W. B. writes: 1. I am building a vapor stove on the same plan as Dr. Regnard's incandescent lamp, as will be seen in the SCIENTIFIC AMERICAN, vol. xvi., p. 398. How shall I obtain a large circular blaze without smoke caused by non-consumed gases, thereby making an offensive smell? A. In order to properly answer your question, we would require full dimensions and size of your stove. However, you can (in a general way) follow the plan of the lamp and produce your large incandescent surface by multiplying burners, and not by making one large one. In this manner you will avoid smoke. 2. In ordering the fluid, shall I order as petroleum or benzine? A. Order either benzine or petroleum naphtha.

(12) J. T. S. asks how to make a cheap steam paste. I have been making a steam paste, and it will sour, and the water back up in the pail and come to the top of the paste. What I want is to make a paste which will not sour and back up the water. I want a paste for bill posting and book-binding work. A. Water is first heated to boiling, and the flour is then added, with constant stirring. To prevent the formation of lumps the flour may be passed through a sieve, so as to insure its more equable distribution; agitation is continued until the heat has rendered the mass of the desired consistency, and after a few minutes for the boiling, it is ready for use. To prevent it from souring add a slight quantity of carbolic acid. In order to make a harder paste, one-sixth to one-fourth of powdered resin to the weight of flour is added; or sometimes alum may be used for the same purpose.

(13) J. D. G. asks: What is the best and cheapest way to get smoke out of clothing? A. The best and cheapest way would be simply to expose the articles to the air, hanging them so that they would become thoroughly exposed. They could be exposed in a closed room to the vapor of ammonia, which, to a certain degree, would neutralize the influence of the smoke. The ammonia should be generated by mixing ammonium chloride (sal ammoniac) with calcium oxide (lime) and adding a little water.

(14) E. J. C. asks: What are shoe buttons made of? If a composition, can you give it? A. Shoe buttons are made of papier maché.

(15) W. M. writes: My Smee's battery has become irregular in its action, and I am informed that it is because its silver plate needs replatinizing. How can I do this? A. In SUPPLEMENT, No. 177, will be found the details of this process.

(16) J. B. asks how to make a liquid bluing. A. Dissolve one-half ounce of soluble blue in a pint of water, and add about ten drops of muriatic acid.

(17) G. L. D. asks: How can I change the color of bronze metal while molten to black or brown? A. For the former, stir in sufficient finely powdered magnetic oxide of iron; and for brown, fine peroxide of iron.

(18) J. R. H. asks: 1. How is sodium made, and what are its constituents? A. Lately sodium has become a by-product in the ammonia manufacture; has formerly been produced by heating its oxide with charcoal. It is an elementary body. 2. Will sodium burn in pure oxygen? A. Yes; under any condition. 3. Is it possible to liquefy sodium? A. It may be readily melted under benzole, at a very moderate heat, carefully applied by immersion in warm water. 4. Can hydrate of soda be produced by other bodies than sodium oxide? A. Yes; it may be formed from the compounds of the latter; for instance, from its oxalate by separating this latter by limewater, etc. 5. Is there any process by which oxygen can be produced from pure air economically and rapidly? A. A process which is described in full in SUPPLEMENT, No. 367, is an excellent one. 6. What proportions of air and hydrocarbon gas give the greatest heat, both being under pressure? A. Twelve of air to one of gas give the most heat, but form a dangerously explosive mixture; seven of air to one of gas is the most practicable. 7. Should the orifice for the air be larger, or the pressure greater? and to what temperature should it be heated to give the best result? A. The orifices or pressure should be arranged that seven parts of air to one of gas will be formed. The air may be heated indefinitely, remembering that the higher its heat the less weight of air (or oxygen) to a cubic foot, as it is expanded by heating. 8. A. This question covers many conditions, of which you do not give the detail. See Edwards' "Steam Engineer's Guide."

(19) J. M. M. writes for information respecting recent improvements in autographic printing processes. A. In SUPPLEMENTS, Nos. 143, 146, and 225, under the above head, will be found every detail of these processes.

(20) C. E. T. desires to be informed the method of manufacturing Spence metal. A. Black sulphide of antimony may be fused readily in a charcoal furnace. When melted, an equal weight of sulphur in fine powder is stirred in and the beat continued until all are in a perfect state of fusion, when it may be cast into any suitable form. Sulphide of iron may be used for an alloy, fusing at a higher temperature and accomplished in the same manner as the above, except that the sulphur should be mixed previously with the sulphide of iron, and the cover of the crucible carefully luted on to prevent the ignition of the sulphur.

(21) M. C. S. asks: How are emery wheels manufactured? A. The emery, of suitable degree of fineness, is agglutinated with glue or mucilage, pressed into shape, and then dried or baked.

(22) C. L. T. asks: 1. What is "fix ore?" A. The ore dried and burnt—thus freed from water or sulphur. 2. Are they more valuable than other conditions of the ore? A. Yes; about \$1.00 in iron ores. 3. Are hematite ores convertible into steel by the Bessemer process? A. Yes; if their percentage of iron is over 60.

(23) J. K. P. writes: I have an engine, 12 inches by 36 inches, running 65 revolutions per minute, with an 8 foot flywheel. I put on a band wheel, 6 1/2 feet in diameter, bearing the 8 foot flywheel on the same shaft, and run the engine at 80 revolutions per minute. The boiler is 16 feet long and 6 feet diameter, with ninety-six 3 inch flues. A steady pressure of 80 pounds is kept up in the boiler. Do I gain any power? If so, how much (about)? A. If you carry the same pressure of steam, your gain of power is proportioned to the increased speed of the piston as 55 to 80.

(24) W. C. B. asks if five miles of one-quarter inch pipe were laid, and an air cylinder placed at one end, would there be any effect at the other end from one compression of piston, saying nothing as to size of cylinder or power to operate? A. We think not; the friction of the pipe would absorb all the increased pressure from one compression.

(25) Inquirer asks: 1. If superheated steam (decomposed water) be let into a holder (like a gasometer), will the heavier gas settle so one could draw off either of the gases, or will the atoms continue mixed with each other? A. Superheated steam is not decomposed water. The gases will not separate. 2. Please tell me, also, if a boat can be propelled by a propeller actuated by foot power like a velocipede, without much exertion? A. It can be propelled, but to obtain a given speed the same power must be applied as by any other mode.

(26) C. A. A. writes: 1. I have purchased a second-hand portable boiler and engine—10 horse power. The fire passes directly through the flues and up the smokestack, and directly under stack and at rear end of boiler and at the bottom is a hand hole for cleaning; it has not been removed for years. On the outside and around it is coated with a substance that cuts like rock with a cold chisel. Is it safe to let it remain in that condition and use it? A. It is not safe. You should take it out to examine its condition. 2. Is steam considered good for cleaning flues? A. Yes; if introduced from another boiler, and the scale subjected to the action of the steam a number of hours till the scale is soft.

(27) R. H. asks how to make gilding for watch plates, and how to apply it. A. The following gilding solution, to be used at a temperature of from 120° to 180° Fahr., has been recommended by M. E. Rod: Crystallized sodium phosphate, 60 parts, by weight; sodium bisulphide, 10 parts; potassium cyanide, 1 part; gold chloride, 25 parts; distilled or rain water, 1,000 parts. To prepare this bath properly the water should be divided into three portions—one of 700 parts, and two of 150 parts, by weight. The sodium phosphate is dissolved in the first portion, the gold chloride in the second, and the sodium bisulphide and the potassium cyanide in the third. The first two portions are gradually mixed together and the third is afterward added. With this solution M. Rod uses a platinum anode—a wire or strip—adding fresh portions of the gold salt as the solutions become exhausted. Spon's Encyclopedia treats this subject very fully, p. 878. A book by J. W. Urquhart on "Electroplating," London, 1880, is good authority; also Gee's "Practical Gold Worker."

(28) G. F. D. writes: I wish to make a cement to coat the inner side of a lead tank which leaks. Will a saturated solution of silicate of soda made into a paste with powdered glass answer? If not, please let me know what is the best cement for such purpose. A. Silicate compounds cannot be recommended for this purpose. If the tank can be tipped over so as to get at the leaky places with a soldering iron, soldering is the only proper and sure remedy. If the leaky places cannot be soldered, then the next best is two or three coats of metallic paint, thoroughly dried. Asphalt varnish or coal tar also makes a very good covering for lead lining.

(29) P. D. writes: What is dead oil? How is it produced, and for what purpose employed? A. It is one of the distillates of coal tar. Its use is principally for the preparation of naphthalene and carbolic acid, and also as an adulterant. Its commercial value is small.

(30) R. B. A. writes: Please describe how to use the method of silvering the backs of looking glasses. A. A sheet of tin foil, of the same size as the glass to be silvered, is laid perfectly level upon a table and rubbed over with metallic mercury, a thin layer of which is afterward poured upon it. The glass is then carefully slid on to the table, so that its edge may carry before it part of the superfluous mercury with the impurities upon its surface; heavy weights are laid upon the glass, so as to squeeze out the excess of mercury, and in a few days the combination of the tin and mercury will be found to have adhered firmly to the glass.

(31) M. D. H. asks for a receipt for making a good and cheap liquid drier; also a dry drier, which, when mixed with linseed oil, will make it dry quickly and very hard. Please give the amount used to each gallon of oil. A. For the liquid drier, boil one gallon of linseed oil for an hour with a pound of finely powdered binoxide of manganese. For a solid drier, use borate of manganese in powder or mixed in oil.

(32) W. C. asks: Can you give a simple formula for bleaching fat, discolored by the vegetable matter from the entrails of the animals from which it is taken? A. About five per cent of ordinary sulphurous acid mixed with the fat, and when the latter is melted by stirring, will answer your purpose. Continue you beat until the fat no longer smells of the gas. If necessary, a greater or less quantity may be used, it being perfectly harmless for after uses of the fat.

(33) G. P. F. writes: I find in No. 8 of the last volume of the SCIENTIFIC AMERICAN a recipe for rebolizing; the meaning I do not quite understand. You say, "then oil, and fill in with powdered drop black mixed in the filler." Will you answer what kind of oil is meant, and whether you put oil in drop black or have them separate? A. Use boiled linseed oil, and mix it with the drop black.