

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.

Large variety of Patterns, just what a new foundry needs. Vertical Double Engine, 40 H. P. Roots Square Rotary Engine 15 H. P. Combined Punch and Shears. Drill Press. Quantity of machinists' and blacksmiths' small tools. For sale, cheap. Mrs. John Ollis, Admx., Bloomington, Ills.

Chard's Extra Heavy Machinery Oil. Chard's Anti-Corrosive Cylinder Oil. Chard's Patent Lubricator and Gear Grease. R. J. Chard, Sole Proprietor, 6 Burling Slip, New York.

Mr. Harrison Phobus, proprietor of the Hygeia Hotel, Old Point Comfort, Va., writes to the H. W. Jones Manufacturing Company, 87 Maiden Lane, New York: "I desire to express my entire satisfaction with your paints, which I have been using a number of years. I now have thirteen acres of wood-work covered with your paints, and as they have successfully withstood the usual effects of salt air, and are in every way satisfactory, I shall continue using them."

Walrus Leather and Walrus Wheels for all metal polishing. Greene, Tweed & Co., 118 Chambers St., N. Y. Clark Rubber Wheels adv. See page 172.

Vacuum Cylinder Oils. See adv., page 173.

The Golden Age—the present—when Esterbrook's Steel Pens, the most popular in use, are within the reach of all.

Wanted.—Single or double engine, 1,000 horses power. Description and price to C. W. Copeland, 24 Park Place.

We have been told that a retail clothing dealer in Chicago has intimated that he is, or has been, connected with Baldwin the Clothier. If such has been the case, or is, Baldwin the Clothier has no knowledge of the connection.

Fine Gray Iron Castings to order. A. Winterburn, Foundry, 16 DeWitt St., Albany, N. Y.

Wanted, first-class large Planer, new or second-hand. Address Lambertville Iron Works, Lambertville, N. J.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 140.

Recipes and Information on all Industrial Processes. Park Benjamin's Expert Office, 50 Astor House, N. Y.

Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor House, New York.

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

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsb'g, Pa.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

Apply to J. H. Blaisdel for all kinds of Wood and Iron Working Machinery. 107 Liberty St., New York. Send for illustrated catalogue.

Our new Stylographic Pen (just patented), having the duplex interchangeable point section, is the very latest improvement. The Stylographic Pen Co., Room 13, 169 Broadway, N. Y.

Skinner & Wood, Erie, Pa., Portable and Stationary Engines, are full of orders, and withdraw their illustrated advertisement. Send for their new circulars:

Sweetland & Co., 126 Union St., New Haven, Conn., manufacture the Sweetland Combination Chuck.

Safety Linen Hose for Hotels, Warehouses, and Factories, as protection from fire. Greene, Tweed & Co., N. Y.

Power, Foot, and Hand Presses for Metal Workers. Lowest prices. Peerless Punch & Shear Co., 53 Dey St., N. Y.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

For the best Stave, Barrel, Keg, and Hogshead Machinery, address H. A. Crossley, Cleveland, Ohio.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros., 381 Jefferson St., Philadelphia, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y.

Split P leys 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 Hogshead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.

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.

Peck's Patent Drop Press. See adv., page 140.

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

Hydraulic Jacks, Presses and Pumps. Polishing and Buffing Machinery. Patent Punches, Shears, etc. E. Lyon & Co., 470 Grand St., New York.

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

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

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 147.

Blake "Lion and Eagle" Imp'd Crusher. See p. 141.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 142.

Saw Mill Machinery. Stearns Mfg. Co. See p. 141.

For Separators, Farm & Vertical Engines, see adv. p. 157.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 157.

For Patent Shapers and Planers, see illus. adv. p. 156.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 157.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Large knife work a specialty. Also manufacturers of Solomon's Parallel Vise. Taylor, Stiles & Co., Hiegelsville, N. J.

The Lace Cutter illustrated on another page can be purchased from Greene, Tweed & Co., 118 Chambers St., New York, N. Y.; Jackson & Tyler, 33 German St., Baltimore, Md.; Joseph Sharp, 59 Walnut St., Cincinnati, Ohio.

Moulder wanted, to take charge and make fine snap work. Must be temperate. Send photograph and recommendation. Perkins & Co., Grand Rapids, Mich.

Situation wanted, by Machinist and Tool Maker; 25 years' experience in all branches. Had charge of large machine shop and brass works. Improved tools for brass work a specialty. J. H. Morris, Box 773, N. Y.

National Institute of Steam and Mechanical Engineering, Bridgeport, Conn. Blast Furnace Construction and Management. The metallurgy of iron and steel. Practical Instruction in Steam Engineering, and a good situation when competent. Send for pamphlet.

Silent Injector, Blower, and Exhauster. See adv. p. 173.

Portable Railroads. Sugar Mills. Horizontal & Beam Steam Engines. Atlantic Steam Engine W'ks, B'klyn, N. Y.

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

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

Brass & Copper in sheets, wire & blanks. See ad. p. 172.

Air Compressors. Clayton Stm. Pump W'ks, B'klyn, N. Y.

A 4 1/2 in. 2 Jaw Chuck, Independent or Universal, for Brass Finishers. Address A. F. Cushman, Hartford, Ct. Diamond Engineer, 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 173.

Eagle Anvils, 10 cents per pound. Fully warranted.

Millstone Dressing Machine. See adv., page 173.

Gear Wheels for Models (list free); experimental and model work, dies and punches, metal cutting, manufacturing, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa.

The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 633 Broadway, New York.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 141.

H. A. Lee's Moulding Machines, Worcester, Mass.

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

New Economizer Portable Engine. See illus. adv. p. 173.

Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 172.

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

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 173. Totten & Co., Pittsburg.

For Yale Mills and Engines, see page 173.

Reed's Sectional Covering for steam surfaces; any one can apply it; can be removed and replaced without injury. J. A. Locke, Agt., 32 Cortlandt St., N. Y.

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) G. A. A. asks: Which is the best pipe to use for heating a room with steam: two rows of one inch pipe or one row of two inch pipe? A. If the radiating surface in the two cases is the same theoretically there should be no difference, but practically we believe the smaller pipes have proved more efficient.

(2) O. V. D. asks: 1. How many pounds ought a three-eighths inch bar magnet hold up, like that described in the SUPPLEMENT, No. 142, in the article "How to Make a Working Telephone," Fig. 4, so that I could tell if it was charged powerful enough? A. About three-fourths its own weight. 2. What would be the numbers of the lenses required to construct a spy glass like that on page 68, SCIENTIFIC AMERICAN, No. 5, Vol. 43? A. Only two lenses are required. The object glass should be achromatic, the eye lens is double concave.

(3) Dr. A. M. C. says: I want to make a sidewalk 10 feet long, 2 1/2 feet wide. What can I use in place of stone or wood, something that is durable and hard? A. You might use ordinary cement, three inches thick, which any mason can put down for you. See SUPPLEMENTS, 33, 36, and 82.

(4) W. H. D. asks: 1. Will a magnet that will lift a one pound weight make a small machine that will make a small current to show how it works? A. Yes. 2. Will sheet glass covered with tin foil on both sides make a Leyden jar, and by combining a large number together, having the negative sides connected and all the positive sides connected, make a powerful battery? A. Yes, but the jars are better. 3. Would not sheet lead answer as a substitute for tin foil? A. Tin foil is best.

(5) J. S. M. inquires as to the best method of preventing woodwork in mills saturated with oils from taking fire in the event of a blaze touching the woodwork. A. Woodwork strongly impregnated with tungstate of soda or silicate of soda (by treatment in strong aqueous solution of these salts) becomes un-inflammable.

(6) G. E. writes: 1. I have bought some woolen underclothing which are so much filled with sulphur that they are very unpleasant to wear. Is the sulphur injurious to health? A. Yes, if present in considerable quantity. 2. What will remove the sulphur? A. Sulphur is soluble in bisulphide of carbon. If the bisulphide used is pure the small quantity adhering to the cloth after wringing will quickly and completely evaporate on exposure to the air.

(7) R. P. asks if there is any indelible preparation for stenciling on unplanned lumber, such as posts, etc., in black or other colors? A. Use a strong turpentine solution of asphaltum, tempered with common printer's ink.

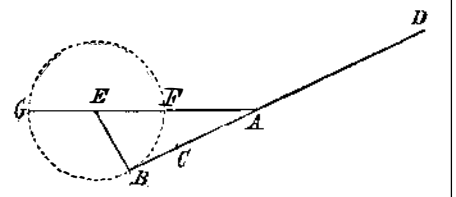
(8) J. G. asks what are the plates on which photographic pictures commonly called tintypes are taken coated with? A. The plates are flowed evenly with japan varnish, and the coating hardened in a japanner's oven. The varnish may be procured at almost any paint store.

(9) P. T. asks how to take stains made by Payson's indelible ink out of linen? A. Moisten with a little iodine, then with ammonia water, and rinse in clean water.

(10) E. H. writes: 1. Referring to your description of Blake's transmitter, on p. 274, vol. 41, SCIENTIFIC AMERICAN, how is the brass button filled with carbon? A. The brass is spun over the carbon. 2. Is it the carbon that weighs three pennyweights, or brass and carbon together? A. Both.

(11) W. S. H. asks: Can you give a simple test for oxygen water; that is, water supposed to contain an extra amount of oxygen—all it will take up? This water is called by some oxygenated water. A. Fill a quart bottle, provided with a perforated cork (tightly fitting) to admit a glass tube, with the water; heat nearly to boiling, and collect the gases given off in a small test tube, by displacement, over the pneumatic trough. Examine the gas with an ignited taper or splint of wood. Momentary increase in the intensity of combustion indicates an unusual amount of oxygen in the water. Compare results with ordinary well or cistern water.

(12) E. T. S., St. Clair, Mich., says: In your issue of August 14, G. G., in the article, "Evolution of Ideas," speaks of the "golden cut." Will you please illustrate what is meant? A. To divide by the "golden cut" is an expression used by mathematicians for dividing by "extreme and mean ratio," and this means, as G. G. correctly remarks, the dividing (of a line, for example) in such a manner that the whole has the same relation to the larger part as the larger part to the smaller, and vice versa. Let A B be the given line which is to be divided by the "golden cut." At B draw to A B the perpendicular B E, equal to one-half of A B. With E as center and A B as radius describe a circumference. Draw the straightline A E G, cutting the circumference



in F and G. On A B lay off A C = A F, and on the prolongation of B A lay off A D = A G. Then the line A B is divided internally at C (and externally at D) by the "golden cut," or in extreme and mean ratio. For since A B is a tangent and A G a secant, A B is, according to a well known thesis of geometry, a mean proportional between A G and A F.

$$\begin{aligned} A G : A B &:: A B : A F \\ A G - A B : A B &:: A B - A F : A F \\ \text{Now, } F G = A B \text{ also } A C = A F \\ A C : A B &:: B C : A C \\ A B : A C &:: A C : B C \end{aligned}$$

The first proportion by composition gives:
 $A G + A B : A G :: A B + A F : A B$
 Since $A G = A D$ and $A B = F G$ we have
 $B D : A D :: A D : A B$

(13) F. P. S. asks: 1. Can paper be made to have the same strength and elasticity as leather? Can it be moulded into a form 6x2x1 inches, and so treated that it will have the same qualities as leather (several pieces glued together) would of these dimensions? A. See "Vulcanized Fiber," p. 10, vol. 38, SCIENTIFIC AMERICAN. 2. How can I make the edges of leather cut by a disk very smooth, and how can I polish them? A. Try a heated iron, or an ivory or bone burnishing tool. 3. How can I make a cement that will be a great deal stronger than glue, for cementing several pieces of leather together? A. See p. 2510, No. 158, SCIENTIFIC AMERICAN SUPPLEMENT.

(14) C. W. H. writes: I wish to learn how to mix shellac in liquid form, to be used in shalacking a cedar boat; that is, how much alcohol to a certain amount of shellac should be used, and how it should be applied so as to obtain a thin hard coating that will wear well. A. Place two pounds of orange shellac in a jug or demijohn, and pour over it one gallon of 95 per cent alcohol; allow it to stand for a day or so, shaking it occasionally, and stirring if it becomes solid at the bottom. When the shellac is entirely dissolved strain the varnish through a piece of flannel. Apply with a flat, soft brush.

(15) F. E. T. asks: What is nickel silver jewelry? I wish to get some of the metal, but find none advertised. A. German silver (a nickel silver) is composed of: 1. (for casting)—copper 5, zinc 2 1/2, nickel 2 1/2; 2. (for rolling)—copper 6, zinc 2, nickel 2 1/2. The specimen metal sent is lead superficially rolled with tin.

(16) C. T. F. writes: I observe in your journal of July 31, p. 69, an article pertaining to the value

of swamp muck. Please inform me how nitrogen is manufactured from swamp muck? A. Muck contains a large per cent of certain nitrogenous compounds, the products of the decomposition of which in the soil are readily assimilated by plants. The amount of nitrogen in the muck is an index of its richness in these foods. Free nitrogen is not readily obtainable from muck. In analysis it is usually determined in the form of ammonia (NH₄OH).

(17) M. F. P. writes: I would like to get the details of lacquering brass goods, such as lamps, springs, etc., to keep them bright and prevent them from tarnishing. See pp. 395 (15), vol. 42; 44 (39), vol. 38; 44 (53), and 188 (52), vol. 37; 242, vol. 34; 139 (41), and 326, vol. 32, SCIENTIFIC AMERICAN, and p. 630, No. 38, SCIENTIFIC AMERICAN SUPPLEMENT.

(18) J. J. M. asks (1) if a dynamo-electric machine will run of itself, or if a battery is applied to it. A. A dynamo-electric machine will generate an electric current without the aid of a battery. 2. What number of wire would I need to make bobbins 2 inches long, 1 inch in diameter? A. It depends on the style of the machine. See article on small electric machine in SUPPLEMENT 161.

(19) C. E. W. writes: I have both copper and brass moulds for small articles, but meet with failure in the metals not running sharp in the small lines. Have tried smoking, but does not work. What can I do to remedy it? I use the most fusible alloys. A. Heat the moulds well before pouring, and coat them smoothly with black lead.

(20) G. M. B. asks: 1. How is nitroglycerine made. A. Nitroglycerine is prepared by bringing glycerine drop by drop into a cooled mixture of very strong nitric and sulphuric acids. The nitroglycerine collects at the bottom of the vessel and is subsequently freed from the acids by carefully washing in a copious supply of water. 2. Is the explosion caused by the rapid transformation of a solid into a gas? A. Yes, in the case of nitroglycerine from the liquid to the gaseous state. 3. Would not iron, wood, or any substance cause explosion if instantaneously changed into a gaseous form? A. Yes. 4. Are the nitrates the only explosive substances known? A. No, gunpowder prepared with chlorate of potash explodes more violently than that in which niter is used.

(21) H. B. C. writes: Will you please inform me the best way to cut carnelian and moss agates? A. Some specimens may be readily cut by means of a thin rotating iron disk charged with emery and water. Extremely hard specimens require diamond dust. It should be mixed with a little olive oil and applied sparingly to the edge of the disk. To cut plane surfaces and facets on these stones use a flat lead lap wheel charged with emery and water. Polish with rotten stone and water applied to a pewter lap.

(22) E. F. L. asks how to cut and finish carnelians and agates. J. have a United States dental lathe. A. See reply to H. B. C. above.

(23) C. & W. write: 1. We are putting in a sixty horse power locomotive pattern boiler. Shell 60 inches in diameter. We use the exhaust steam in a dry house. As we cannot use exhaust steam for heating water, we have extended the space behind the tubes four feet, and propose putting in a coil of 400 feet of 1 1/2 inch pipe through which water will be forced. The heat after passing through the tubes will strike this coil. Is the plan a good one? A. Your plan would heat a limited quantity of water. 2. Is it advisable to use steam jet instead of scraper, for cleaning tubes? A. The steam jet is used very successfully. 3. Should we run exhaust steam through a boiler, say thirty minutes, then close all openings except a pipe running down to water fifteen feet below; would not the steam condense and partially fill the boiler? If so, how full? 3. Yes, probably fill the boiler entirely.

(24) W. E. F. writes: In your SCIENTIFIC AMERICAN and the SUPPLEMENT you speak of preserving iron in water and ships' bottoms by the application of creosote. Is it oil of creosote as sold by druggists, and can it be applied with a brush on the outside? I am putting in a flume 90 feet long by 22x12; can I so coat the timbers? Also, I have a fine yacht; can I, when I haul her out for the season, and get her well dried under cover, paint her inside and out with oil of creosote and hope to make her last longer? A. Commercial creosote is commonly a mixture of creosota, picamar, and light tar oil. The colorless transparent liquid usually sold by pharmacists is the purified creosote. The former is the substance used for wood. The wood is impregnated with the creosote by immersing it in the liquid, usually under pressure. It is not usually applied with a brush, as you suggest, and is not suitable for inside woodwork.

(25) H. A. C. writes: A diploma on parchment was, as I thought, greatly injured by dropping writing ink near and adjoining the printing on the side of the diploma. Framing would not hide the blots. Not knowing what I was doing I used a strong solution of tartaric acid for the purpose of removing the stain. This only served to change the color of the blots from black to blue. It was much fainter, however, than before, and appeared to be in the parchment rather than on it, as before. The parchment had shrunken somewhat now after drying, but as the spot was not larger than a silver quarter, it was not noticeable. I now took chloride of lime to remove the blue stain, but this solution served to shrink the parchment where it was wet to a considerable extent. Not having any means of stretching the spot, and not knowing what to use for that purpose, I laid the diploma away as soon as it dried and have never since opened it. Will you tell me how can I get the spot back to its former dimensions? A. You may try the following: Moisten the spot with water, and rub it over gently at first with the white of an egg mixed with a small quantity of freshly prepared flour paste. Press between blotting paper with a warm iron. A little alum and a trace of oil may be added to the paste if found necessary.

(26) E. Y. D. writes: I have a sun dial made in Germany for 48° 15' latitude, and I want to know if I get correct time with it in latitude 38° 50'; if