

## 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 H. W. Johns Mfg. Co.'s new colors of Asbestos Liquid Paints are particularly appropriate for large structures, such as manufactories churches, bridges, etc. We advise all owners of such buildings which require painting to send for samples.

Van Beil's "Rye and Rock" is acknowledged to be the best remedy for lung and throat diseases.

Hartshorn's Self-Acting Shade Rollers, 486 Broadway, New York. No cords or balances. Do not get out of order. A great convenience. Sold everywhere by the trade. See that you get Hartshorn's rollers. Makers and dealers in infringing rollers held strictly responsible.

Hotchkiss' Mechanical Boiler Cleaner, 84 John St., N. Y., illustrated Sci. AM., Nov. 6, 1880. New, enlarged, and simplified form; quite inexpensive. Engineers make ten per cent selling other parties than employers.

Street Sweeper, Smith's patent, for sale. Machinery Exchange, 261 N. 3d street, Philadelphia.

Second-hand large size Wood Planer, R. Ball & Co. make, for sale cheap, by Wm. M. Hawes, Fall River, Mass.

Don't buy a Steam Pump until you have written Valley Machine Co., Easthampton, Mass.

Standard—Reliable—Popular.—The Steel Pens manufactured by the Esterbrook Steel Pen Co., 26 John street, New York. Works, Camden, N. J.

Wm. Sellers & Co., Steam Hammers. See adv., p. 108.

The Practical Papermaker; a complete guide to the manufacture of Paper, by James Dunbar. \$1.00. Mail free. E. & F. N. Spon, 446 Broome street, New York.

Best Turkey Emery and Star Glue, specially for polishers. Greene, Tweed & Co., 118 Chambers st., N. Y.

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

Mechanical Draughtsman desires engagement. Thorough mechanic. Bright on special machinery and tools. A. C. C., Box 773.

Wanted—An experienced and thoroughly capable machinist, competent to design, build, and set up in working order light, special machines in a manufacturing business; also to superintend repairs in shop connected with the factory; must furnish best reference as to character, habits, and ability. Address P. O. Box 539, Baltimore, Md.

Rubber Packing, Soapstone Packing, Hemp Packing, Empire Gum Core Packing. Greene, Tweed & Co., N. Y.

Will sell reasonably, Patent Mill Feeder. Suitable for millwrights to handle. Jas. P. Lowell, patentee, Purcellville, Va.

Builders of tramways and machines for crosscutting timber in forests, send circulars to Wm. Brown 2212 De Kalb street, St. Louis, Mo.

Abbe Bolt Forging Machines and Palmer Power Hammer a specialty. S. C. Forsaith & Co., Manchester, N. H.

L. Martin & Co., manufacturers of Lampblack and Pulp Mortar-black, 236 Walnut St., Philadelphia, Pa.

Foot Power Machinery for use in Workshops; sent on trial if desired. W. F. & Jno. Barnes, Rockford, Ill.

Large Slotter, 72" x 18" stroke. Photo on application. Machinery Exchange, 261 N. 3d St., Phila.

List 25.—Descriptive of over 2,000 new and second-hand machines, now ready for distribution. Send stamp for same. S. C. Forsaith & Co., Manchester, N. H.

Burgess' Portable Mechan. Blowpipe. See adv., p. 76.

Books for Engineers and Mechanics. Catalogues free. E. & F. N. Spon, 446 Broome St., New York.

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. Arny & Son, Manufacturers Philadelphia. Correspondence solicited.

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. Cordeman, Egan & Co., Cincinnati, O.

The "1880" Lace Cutter by mail for 50 cts.; discount to the trade. Sterling Elliott, 262 Dover St., Boston, Mass.

The Tools, Fixtures, and Patterns of the Taunton Foundry and Machine Company for sale, by the George Place Machinery Agency, 121 Chambers St., New York.

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

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsburg, 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. Recipes and Information on all Industrial Processes. Park Benjamin's Expert Office, 50 Astor House, N. Y.

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

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

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

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

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

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

Clark Rubber Wheels adv. See page 109.

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

Blake "Lion and Eagle" Imp'd Crusher. See p. 109.

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

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.

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.

The I. B. Davis Patent Feed Pump. See adv., p. 76.

Moulding Machines for Foundry Use. 33 per cent saved in labor. See adv. of Reynolds & Co., page 76.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 77.

Saw Mill Machinery. Stearns Mfg. Co. See p. 77.

The Sweetland Chuck. See illus. adv., p. 76.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J. Rollstone Mac. Co.'s Wood Working Mach'y ad. p. 92.

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

Eclipse Portable Engine. See illustrated adv., p. 93.

4 to 40 H. P. Steam Engines. See adv. p. 93.

For Machinists' Tools, see Whitcomb's adv., page 73.

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

Peck's Patent Drop Press. See adv., page 109.

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. 109.

Wren's Patent Grate Bar. See adv. page 109.

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

For Best Indirect Radiators, see adv., page 109.

Eagle Anvils, 10 cents per pound. Fully warranted.

Engines repaired without loss of time. L. B. Flinders Machine Works, Philadelphia, Pa.

Machinists' Tools and Special Mach'y. See adv., p. 109.

Houston's Four-Sided Moulder. See adv., page 109.

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

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

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 108.

The Student's Illustrated Guide to Practical Draughting. By T. P. Pemberton. Sent on receipt of price, \$1. Address T. P. Pemberton, 5 Dey St., Room 13, New York.

New Economizer Portable Engine. See illus. adv. p. 108.

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

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

Saunders' Pipe Cutting Threading Mach. See p. 109.

Toope's Pat. Felt and Asbestos Non-conducting Removable Covering for Hot or Cold Surfaces; Toope's Pat. Grate Bar. Chas. Toope, M'f'g Agt., 353 E. 78th St., N. Y. Use Vacuum Oil Co.'s Cylinder Oil, Rochester, 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) B. R. asks: What is the best method of spreading a thin layer of selenium on glass surfaces and other smooth surfaces of that description? A. This is a subject of which there is but little known at present, for, as *Nature* says, "the investigation is one that requires to be carried on with the aid of a fully equipped laboratory, and is beyond the power of an ordinary experimentalist." It is, in the meantime, uncertain as to whether a transparent sheet of selenium can be more easily obtained by a method of precipitation than by mere mechanical treatment. It dissolves fuel in chloride of selenium and precipitates slowly in a botryoidal mass of black selenium. It also separates in the crystalline form from solutions of selenide of potassium or sodium. In its vitreous condition selenium melts at a temperature of about 220° Fah., and can be drawn out between mica plates to a thin red film.

(2) C. V. S. asks: 1. How many mercury flasks, as described in SUPPLEMENT, No. 182, would I need for a boiler for a boat 30 feet long, 6 or 6½ feet beam, and 3 feet deep? A. At least 60 for water and 90 for steam. 2. In laying the keel, should it be of one piece of oak, 33 or 34 feet long, steamed and bent to form the bow; or should it be a piece of oak, 33 or 34 feet long, with the bow and stern post rabbeted to the keel? A. It may be steamed and bent, or the stem and stern posts may be scarped to the keel and fastened by rivets. 3. What size should the engine be for a boat 30 feet long, of the style described in SUPPLEMENT, No. 81, of the

Flirt, built by H. S. Maxim? A. 5 inch to 6 inch cylinder and 6 inch stroke. 4. Could I with a boat of this size go from New York city to United States of Colombia, say to Aspinwall, and if so, what would I need besides compass, charts, and lamps? Would I have to get any papers permitting me to go on said voyage, as the owners of vessels have to have? A. It must be inspected and licensed if over 5 tons measurement.

(3) D. A. asks: 1. Which is the better device to keep steam on a self-propelling fire engine: to keep a banked fire in the furnace, or to use a heater similar to those employed with the ordinary fire engine? In fact, is the first method a safe one? A. We consider the heater the safest. 2. In connection with a heater for keeping water hot in an engine, which pipe should be the largest: the one leading to or from the engine? A. It is quite as well to have both pipes of the same size; but if a difference is made, the return pipe should be the larger.

(4) F. W. F. asks: 1. How can I polish a small plano convex lens which is slightly scratched on the surface? A. See article on lens making, vol. xliii, page 51, SCIENTIFIC AMERICAN. 2. What preparation shall I apply to paper or other substance to take pictures with a camera, and cost of same? A. This information to be of any practical value would require too much of our space. Consult some good work on photography. 3. Why is a meniscus lens better for the object glass of a refracting telescope than a double convex lens, so stated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 252? Does it give less prismatic colors? A. With the meniscus there is less spherical and chromatic aberration. 4. I have a private acoustic telephone line; line wire very small size copper wire. At each end I have a wire also of copper two or three times as large as line wire, running down into moist earth and twisted around the line wire. Will these wires convey to the ground any charge which the line may receive during a thunder shower, preventing all danger to the inmates of the houses? A. Yes, providing the ground ends are terminated in a coil buried in a bushel or so of coke which is always enveloped in moist earth. It would be better to solder your ground wire to a gas or water pipe if possible.

(5) E. W. C. asks: 1. Can a rotary engine such as the "La France Fire Engine," be run backward by bringing the steam in through the exhaust pipe? A. Yes. 2. Could such engine be run by gas, by having the explosion at regular intervals? A. It might be run in that way. 3. Which would be the most economical, the above or a cylinder engine using gas, the power being 2,000 foot pounds? A. The cylinder engine.

(6) J. B. H. asks: What will restore on silks and silk laces luster lost in dyeing? A. Grate half a dozen large potatoes into a gallon of soft water, agitate briskly for a few minutes, and let stand 24 hours to settle. Carefully draw off the clear liquid, and with this sponge the fabric thoroughly. Press very strongly with hot irons—in one direction—between fine cloths; kept moist.

(7) E. B. asks: What are the dimensions and tonnage of the yacht America, whether she is keel or center board, and the lengths of her spars? A. Yacht America's original dimensions were: Length on load, water line, 90 feet 8 inches; breadth, extreme, 22 feet 6 inches; carpenter's tonnage, 210 tons. Her present masts are: mainmast, 73 feet long; foremast, 76 feet 6 inches; mainboom, 70 feet long; foreboom, 26 feet long.

(8) F. L. P. writes: In your issue of January 22, in reply to L. D. G., you say the pressure on the feed pipe is a trifle more than on the boiler. Will you be so kind as to explain how you get the extra pressure? A. The difference in pressure is due, first, to the greater area, the upper, than the underside of the delivery valves; second, to the friction of the valves; and third, the friction of the water in the pipes and passages.

(9) U. D. M. asks: 1. What is the rule for running a belt from one pulley on to another on a bevel so as to run the shafts on an angle? A. You will find the rule with a diagram on page 27 (5), Vol. 40, SCIENTIFIC AMERICAN. 2. How much power can we use on the end of a 1½ inch shaft 250 feet long, without twisting it? A. It depends upon the speed of the shaft. 3. How large a steel wire rope do we need to 5 horse power, 250 feet from first pulley? A. It depends upon the speed of the rope. You can get tables of sizes and speeds from manufacturers of wire rope. 4. Which is the cheapest and best to use for 5 horsepower, 250 feet from driving pulley, steel wire rope or iron shaft? A. Wire rope.

(10) J. S. H. writes: I have an office hand lithograph press for printing letters on stone. I get a splendid impression of transfer on the stone, but after dampening the stone with a sponge it seems to take the ink almost as readily as the transfer, thus smutting up the print. I use a buckskin roller and printer's news ink. Can you tell me how to proceed so that the stone will not take the printer's ink except where the transfer ink strikes, and how to get a clear and clean print? A. Let the stone dry and wash it with a 2 per cent aqueous solution of nitric acid; rinse in water and then in weak gum water preparatory to inking. Add a little stale beer or vinegar to the water used for dampening. Use good lithographic ink.

(11) B. I. B. asks: What kind of varnish or oil will be best for preserving eggs, and how can it be applied so as to have a thin, even coating? I want something in which eggs can be dipped. A. You may try ordinary linseed oil (used for this purpose in Germany), or thin alcoholic shellac varnish. See SUPPLEMENTS, Nos. 53 and 65; also SCIENTIFIC AMERICAN, Vol. 39, p. 375.

(12) J. S. H. writes: I see many inquiries in your columns asking how to clean the aniline ink from printing pads after through printing. I can answer. Saturate a sponge in water as hot as possible to bear the hand in, pass the wet sponge across the face of the pad and the ink will disappear. Then rinse off the face with the sponge dipped in cold water. Experience has also taught me that when the print begins to get dim, if you will dampen the face of the pad with

a sponge dipped in cold water, the ink becomes as bright as at first, and in this way a much larger number of letters may be pulled than if this process is not employed.

(13) C. C. C. asks: Is there no way in which rubber could be softened in process of making rubber stamps except by heat? A. Sulphide of carbon, benzole, turpentine, and the essential oils in general cause rubber to swell and soften. While thus softened it may be moulded; but as the oils or other liquids used escape by evaporation it shrinks again. Softening by heat gives more satisfactory results.

(14) T. B. asks: Which has the most friction, a locomotive crank pin seven inches in diameter or one four inches in diameter, the width of bearing being the same in both cases? A. The conditions being the same, the friction would be the same in both cases, but the loss of power would be greater with the larger pin, as the friction acts upon a longer radius.

(15) J. W. asks: 1. What sized belt will give 150 horse power under following conditions: Driving pulley 7 feet in diameter, driven 4 feet, belt in contact with one half the circumference of 4 feet pulley, speed of belt 3,300 feet per minute? Please give rule, A. Calculate by the following formula,  $\frac{WS}{600}$  = horse power, W = width of belt in inches; S = speed of belt in feet per minute. In your case belt should be 33 inches wide in round numbers. In this case 600 is used for a divisor, because of the favorable conditions; for narrow belts use 800.

(16) E. H. asks (1) how much power a certain size pulley (say 12 inches diameter, 6 inches face) will transmit at a given speed to a pulley of equal size. A. We suppose your pulley of 6 inches face would run a 5 inch belt. A safe rule for the power of a belt is  $\frac{WS}{800}$  = horse power, where W = width of belt in inches, and S = speed of belt in feet per minute. From this you can get the power of your pulley. 2. Can you recommend a book treating on the subject? A. "Cooper on the Use of Belting."

(17) L. J. C. asks for the best methods of sticking paper together to make paper boats, pails, or things similar. A. One of the following cements will probably answer: 1. Waterproof: gum rubber, 1 lb.; shellac, 2 lb.; benzole, 12 lb. Cut the gum rubber into fine shreds, and macerate it with frequent agitation in the benzole until dissolved. Then place the vessel (out of doors) in a bath of hot sand, and gradually add, with constant stirring, the powdered shellac. Heat and stir until a perfectly homogeneous mass is obtained—marine glue. In heating, the best vessel to use is a porcelain enameled iron dish. For a stirring rod use a pestle. 2. Gum rubber, 1 lb.; asphaltum (not tar), 2 lb.; benzole, q. s. Cut the rubber fine, macerate until it is dissolved in the benzole, then gradually add the asphaltum, triturate together in a mortar until all is softened and dissolved. It should have about the consistency of molasses. 3. Resin, 2; boiled oil, q. s.; plaster of Paris, 2; turpentine oil, ¼. Melt the resin in the heated oil, remove out of doors, and stir in the plaster and turpentine while hot.

(18) W. R. R. writes: We are building a water tank 15 feet diameter, 10 feet deep, to hold water pumped from a well; the water will be used to supply and wash out our locomotives. Should the inside of tank be painted? If so, what is best? A. Paint with brown oxide paint (oxide of iron), ground in and mixed with pure linseed oil.

(19) J. S. M. asks: Are the rims of railway car wheels chilled? If so, will the rim and center of the wheel, when retempered, be equally soft in temper? A. They are chilled, and when retempered, the effect of the chill is, to a great degree, destroyed.

(20) J. T. M. asks for a receipt for staining whisky barrels a weather-beaten color. A. Use a strong aqueous solution of green copperas (sulphate of iron) or nitric acid.

(21) C. W. V. writes: 1. I want to tin hoop iron. What can I use to take off the scale? I have tried muriatic acid, but it does not seem to clean it. A. Pickle in a bath of muriatic acid 1 part, water 20 parts, until the red oxide disappears, rinse and heat to redness to remove the scale, hammer on an anvil, and immerse in a bath of fermented bran water at 100° Fah. for about 12 hours. On removing brighten by pickling in oil of vitriol 1 part, water 20 parts, at 100° Fah. Finish by scouring with hemp and fine sand. This is the usual method. 2. Can I mix lead with the tin? If so, what proportion can be used? A. Lead can be mixed with tin up to 50 per cent, but in such a bath the lower portions soon become richer in lead on standing, and the results are not good.

(22) J. S. B. M. asks: 1. How can mica be dissolved so as to form a varnish? A. Mica cannot be dissolved so as to be useful in the way you propose. 2. What is the best article I can use to bring zinc (metal) to a high polish for engraved signs? A. Use fine pumice stone and a little oil first, and finish with fine tripoli.

(23) E. H. B. asks: What is the method used to keep an ice house dry—the air dry—so that eggs or products similar can be kept in it for some months without spoiling? A. The dryness of an ice house depends more on its construction than anything else. The ice receptacle should be located so that the moisture of the room may be condensed on it and conveyed away.

(24) G. T. asks for a receipt for a first class office mucilage. Something that will not blister the paper as most of them do. A. Try the following: Good gelatin, 5 oz.; rock candy, 20 oz.; gum arabic, 3 oz.; water, 20 oz.; oil of cloves, a few drops. Soak the gelatin in the cold water over night, then heat to boiling for several hours (replacing the lost water), and gradually introduce the other materials.

(25) M. L. B. asks for a good receipt for a preparation that will effectually stop a constant steam leak when red lead is insufficient, such as around stud bolts, or cracks in castings, etc. I once was handed for trial a preparation resembling yellow clay to be ap-