

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.

16 ft. Steam Yacht, very cheap. Box 10, Bridgeton, N. J. Lathes.—80 inch swing, 8 foot bed, ready June 1. F. C. & A. E. Rowland, New Haven, Conn.

Excelsior Metallic and Steel Tapes. The most durable and the handiest made. General depot, Keuffel & Esser, New York.

A novel without a plot in it would be as rare to find as a stationer's stock without Esterbrook's Pens.

Wanted, a Mechanical Draughtsman, acquainted with stationary engine and general machine work. Machinist preferred. Address T. E. J., P. O. Box 773, New York.

THE SINGER MFG CO'S CASE FACTORY, }
SOUTH BEND, IND.

H. W. Johns Manufacturing Company, New York.

GENTLEMEN: Some of your Asbestos Roofing was used to cover our dry kilns during 1879, and at this date is in good order. The under side of the roof is exposed to steam and acid generated in drying lumber, and a temperature of 250° heat; while the roof rafters and sheathing have cracked by the heat, your roofing shows no sign of damage. Tin roofs, painted both sides, used to last but a few months, while the ordinary gravel roofs are useless on our kilns. Yours very truly, L. PINE, Supt.

A thoroughly competent Foreman in an Organ Factory wanted. Address Lock Box 83, York, Pa.

Drop Forgings. Billings & Spencer Co.

"T. New, 32 John St., New York, has sold and applied over fifty million feet of his Prepared Roofing, the major part being placed upon manufacturing establishments."—SCIENTIFIC AMERICAN.

Agents Wanted.—None but intelligent and energetic need apply. Must furnish good recommendations, or no notice will be taken of applications. Exclusive territory given. Agents are now making from \$10 to \$15 a day. Address, for terms, The Infallible Coin Scale Co., 267 Broadway, New York City.

Improved Skinner Portable Engines. Erie, Pa.

Jas. F. Hotchkiss, 84 John St., N. Y.: Send me your free book entitled "How to Keep Boilers Clean," containing useful information for steam users & engineers. (Forward above by postal or letter; mention this paper.)

Steel Stamps and Pattern Letters. The best made. J. F. W. Dorman, 21 German St., Baltimore. Catalogue free. Abbe Bolt Forging Machines and Palmer Power Hammers a specialty. S. C. Forsaith & Co., Manchester, N. H.

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y. For Power & Economy, Alcott's Turbine, Mt. Holy, N. J. Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J. Latest Improved Diamond Drills. Send for circular to M. C. Bullock, 80 to 88 Market St., Chicago, Ill.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O. Cope & Maxwell Mfg Co.'s Pump adv., page 263.

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.

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

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

List 27.—Description of 3,000 new and second-hand Machines, now ready for distribution. Send stamp for same. S. C. Forsaith & Co., Manchester, N. H., and N. Y. City.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 270.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil.

The Sweetland Chuck. See illus. adv., p. 270.

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

4 to 40 H. P. Steam Engines. See adv. p. 285.

Supplee Steam Engine. See adv. p. 221.

Saw Mill Machinery. Stearns Mfg. Co. See p. 286. See Bentel, Margedant & Co.'s adv., page 304.

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

Machine Diamonds, J. Dickinson, 64 Nassau St., N. Y. The Berryman Feed Water Heater and Purifier and Feed Pump. L. B. Davis' Patent. See illus. adv., p. 304. Telegraph, Telephone, Elec. Light Supplies. See p. 316.

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.

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. 304. Elevators, Freight and Passenger, Shafting, Pulley, and Hangers. J. S. Graves & Son, Rochester, N. Y.

Gould & Eberhardt's Machinists' Tools. See adv., p. 308. For Heavy Punches, etc., see illustrated advertisement of Hillis & Jones, on page 304.

Centrifugal Pumps, 100 to 35,000 gals. per min. See p. 304.

Barrel, Key, Hoghead, Stave Mach'y. See adv. p. 305.

Lehigh Valley Emery and Corundum Wheels are free cutting, durable, and safe. Can be adapted to all kinds of work. Write for prices, stating sizes of wheels you use. Lehigh Valley Emery Wheel Co., Lehighton, Pa.

Mineral Lands Prospected, Artesian Wells Bored, by Diamond Drill Co. Box 423, Pottsville, Pa. See p. 303.

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

Steam Pumps. See adv. Smith, Vaile & Co., p. 306.

For best low price Planer and Matcher, and latest improved Sash, door, and Bin 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.

Common Sense Dry Kiln. Adapted to drying of all material where kiln, etc., drying houses are used. See p. 306.

The Porter-Allen High Speed Steam Engine. South-work Foundry & Mach. Co., 430 Washington Ave., Phil. Pa.

NEW BOOKS AND PUBLICATIONS.

CLARK'S NEW SYSTEM OF ELECTRICAL MEDICATION. By A. W. Tipton, M.D., Jacksonville, Illinois: The Author. 8vo, leather. \$4.

A revised and enlarged edition of Daniel Clark's treatise, first published in 1866. Since that date Dr. Tipton has brought out several editions at his own cost, thus proving the fervency of his discipleship. He believes that the electric current, applied as Clark's theory directs, in connection with other remedies, is a valuable curative agent. How far the theory bears the test of practical applications at the hands of others does not appear.

NEW YORK WATER SUPPLY. Department of Public Works. 8vo, cloth. pp. 64.

Commissioner Thompson's report on a proposed new aqueduct and storage reservoir for additional supply from Croton River, with detailed report of Isaac Newton, Chief Engineer of the Croton Aqueduct, and opinions of consulting engineers. The latter report contains a large amount of information with regard to the present and possible scope of New York's water supply from the Croton Valley and the Housatonic River. It carries an excellent map.

HOW TO MAKE PICTURES: EASY LESSONS FOR THE AMATEUR PHOTOGRAPHER. By Henry Clay Price. New York: Scovill Manufacturing Company. Cloth, pp. 92.

The simplicity, cheapness, and portability of the apparatus employed in dry plate photography has enabled the camera to more than supersede the sketch book for travelers, students, and others, who wish to keep permanent memorials of scenery, buildings, or other objects of nature and art which may seem worthy of remembrance. This little handbook sufficiently describes the apparatus used by such amateur photographers, and so much of the art of photography as they may need to know to make a good beginning.

ANNUAL REPORT OF THE FRUIT GROWERS' ASSOCIATION OF THE PROVINCE OF ONTARIO FOR THE YEAR 1881. 8vo, pp. 136.

ANNUAL REPORT OF THE ENTOMOLOGICAL SOCIETY OF THE PROVINCE OF ONTARIO FOR THE YEAR 1881. 8vo, pp. 85. Toronto: printed by order of the Legislative Assembly.

These two reports bound together make a creditable volume. The first indicates a promising interest and progress in Canadian fruit growing, forestry, and kindred subjects. The second contains much useful information relative to Canadian insects.

A SYSTEMATIC HANDBOOK OF VOLUMETRIC ANALYSIS. By Francis Sutton, F.C.S., F.I.C. Philadelphia: Presley Blakiston. Cloth, pp. 471. \$5.

Working chemists need no introduction to this standard treatise. For this fourth edition the work has been carefully revised, and so far as the progress of chemistry has made necessary, rewritten.

AMERICAN CHEMICAL JOURNAL. Edited, with the aid of chemists at home and abroad, by Ira Remsen, Professor of Chemistry in the Johns Hopkins University. Baltimore: Published by the editor, 6 parts a year. pp. 400 to 500. Price \$3. Single number, 50 cents.

The third year and volume of this valuable periodical have just been completed. As a record of original research in chemistry its standing is unsurpassed in English. The frequent reviews of recent progress in the several departments of applied chemistry constitute a feature of wide practical value and interest.

YENSIE WALTON'S WOMANHOOD. By Mrs. S. R. Graham Clark. Boston: D. Lothrop & Co. \$1.50.

The author tells us that this is not a book for critics, but for the sorrowing, burdened toilers of her own sex, which bears an opinion here. It is a high tension, Sunday-school library love story.

INTERIORS AND INTERIOR DETAILS. INTRODUCTION, DESCRIPTION OF PLATES AND NOTES ON WOOD FINISH. By William B. Tutbill. New York: W. T. Comstock. Quarto, cloth. 52 plates. \$7.50.

A comprehensive and valuable series of suggestions for architects and architectural designers, reproduced from original drawings by prominent architects in New York, Boston, Chicago, and other cities.

REPORT OF THE STATE BOARD OF HEALTH ON THE EPIDEMIC OF DIPHTHERIA IN FREDERICK CITY, MARYLAND. By C. W. Chancellor, M.D., Secretary. Baltimore.

The aim of the inquiry here reported upon was not merely the abatement of the epidemic, but also such a study of the conditions which invited and made it possible or might contribute to the general sanitation of the State. There is reason to fear that many towns, naturally as favorably situated for health as Frederick City is, are more or less rapidly preparing for a similar scourge by a general neglect of sanitary precautions.

WHITEHEAD'S AMERICAN PASTRY COOK. By Jessup Whitehead. Chicago: National Hotel Reporter. Cloth. \$2.

Contains 814 tried receipts, plainly worded and given so fully and explicitly that there should be no failure or

even uncertainty in following directions. It is more comprehensive than the title indicates, covering, in addition to fine pastries, ices, creams, and dessert dishes in general, puddings, souffles, and meringues; breads and cakes, and salads and cold dishes.

A FAMILY FLIGHT THROUGH FRANCE, GERMANY, NORWAY, AND SWITZERLAND. By Rev. E. E. Hale and Miss Susan Hale.

ALL ABOARD FOR SUNRISE LANDS. By Edward A. Rand. Boston: D. Lothrop & Co.

Two books of juvenile travel, profusely illustrated, and likely to be attractive to young readers, who will not suspect that the travels were invented to furnish a thread for stringing a multitude of pictures unless they happen to get both books at once and see the same cuts doing service in opposite parts of the world.

WHAT IS BRIGHT'S DISEASE? ITS CURABILITY. By Seth Pancoast, M.D. Philadelphia: The Author. \$1.

According to Dr. Pancoast's view Bright's disease involves not the kidneys alone but the heart, lungs, and liver also, and the disease may exist for months before albumen can be detected in the urine. The "disease is due to an enervation of the nervous system." The first step toward cure is to correct or replace by normal action "the enervation of the vital energy centered in the organic nervous system." The curability of the disease under timely and proper treatment is strongly insisted upon.

THE CENTURY MAGAZINE. New York, 1882. The Century Company, Publishers, Union Square. Price \$3.50.

The first bound volume of this splendid periodical (formerly Scribner's Magazine) presents a most attractive appearance so far as typography is concerned, while the contents are in the highest degree valuable. The volume contains over one thousand pages of fresh and interesting matter, adorned by hundreds of original engravings, embracing novels, short stories, poetry, essays, biography, travels, literary reviews, scientific notes, etc. Several excellent improvements in the typography of the magazine have been added and the pages have been enlarged. The circulation of the magazine has risen from 120,000 to 134,000, which shows that the public recognizes the value of the work.



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) L. K. B. writes: I send you to-day by mail a piece of lead pipe, laid about ten years ago some three feet underground; the soil from which this piece came being "made ground" principally, as the pipe was laid under railroad tracks. Will you kindly inform me through the columns of the SCIENTIFIC AMERICAN (to which I am a subscriber), to what causes the holes in the pipe are to be attributed? A. The corrosion of the lead pipe was probably due to the action of water charged with carbonic acid.

(2) P. H. writes: I have seen the colors in woolen goods tested by soaking a small piece in a solution of acid of some kind, the test showing what the colors would fade to if exposed to the sun. Can you tell me what the acid or solution is? A. It is probably a solution of an alkaline sulphite slightly acidified with oxalic acid. It could be ascertained definitely by a simple chemical analysis.

(3) T. W. says: I have a piece of carving in Babbitt metal, a family relic. I want to fill up the lines with red and black composition, the same as zinc name plates are filled in with. The article must stand the heat of summer sun. A. For red filling: Mix with thick copal varnish enough vermilion to produce a thin paste. For black; use ordinary black japan mixed with a little ivory black. Apply with a small spatula, moistened with oil of turpentine, and let the composition dry thoroughly before dressing.

(4) F. W. asks: Will you please describe the method of taking copies by the blue process? I notice in your issue of April 15, how to prepare the paper, but am at a loss to know how to use it. A. Expose the prepared paper under a clear ink tracing (on tracing cloth) or a glass negative, to sunlight for from five minutes to half an hour, according to the strength of the light. Then remove to a dark room, and wash the paper in plenty of running water, and dry in the air.

(5) C. F. B. asks (1) for a simple and good way to soften steel hammers for drilling the handle holes. A. Heat them uniformly to a cherry red heat, and bury them in dry wood ashes, or better, pulverized charcoal, and let them remain till cold. 2. What is the best way to clean a vertical tubular steam boiler, about 9 feet high, 4 feet diameter, with 61 tubes inside?

A. If you wish to clean the fire side of the tubes, use a wire brush or scraper; if the water side, it will depend upon the deposit. If you could empty the boiler of water, close it tight, and admit steam from another boiler; after a few hours the scale will rot and fall off. You must then use suitable means or tools to draw the scale from the boiler.

(6) A. S. asks: 1. What constitutes the strength of the electro magnet? A. It is not definitely known. 2. Does more wire on the spool make it stronger, or does the size of the iron core make the strength, the electric power being the same? A. The magnetic strength of an electro magnet depends upon the size of the iron core, the number of turns of wire surrounding it, and the strength of current charging the wire of this helix. In practice these helices are seldom wound to a diameter exceeding three times the diameter of the core, as what is thereby gained in magnetic moment is more than lost in increased resistance of helix circuit. 3. Would two electro-magnets with a wire spool in each of the four helices equal in thickness to the diameter of the iron core, attract each other with greater force than one of them would attract an armature? A. Yes, if unlike poles were opposed. 4. Would one electro-magnet, as per question three, be as strong or stronger than both if the wire in the first instance on the two were placed on only one? A. If the same current were employed, no. 5. Would the strength of the magnet be enhanced by enlarging the ends of the wire core? A. As we understand you, no. 6. Would an electro-magnet be made stronger by using several soft inner magnets in one? A. The advantage of this arrangement would not be great.

(7) S. P. G. writes: I want to make carbons for a Bunsen battery. I have tried gas coke pounded fine and mixed with treacle, then pressed in an iron mould and burnt, but when cooled and removed from mould, are lighter in weight, and crumble away if pressed in the hand, compared to those one buys. Please inform me what are the ingredients of such carbons, how are the ingredients mixed, and after mixture what process do they undergo? Are they pressed and heated (burned)? If so, to what extent? A. In the preparation of ordinary battery carbons it has lately been the practice to use gas tar as the cementing substance instead of saccharine matters, etc. The gas carbon is reduced to a powder, and this is uniformly mixed together with just enough of the tar to make a stiff smooth paste. The paste (or dough) is forced into the moulds under considerable pressure, then heated slowly at first, and finally at very bright redness. When cooled the plates are put to soak in a gas tar liquid and afterwards rebaked. They can by these means be made very dense and hard.

(8) B. B. asks: Is there any process by which rather thick paper can be rendered transparent? A. It can be rendered quite translucent by saturating it (while warm) with Canada balsam or castor oil, but we know of no process of treatment whereby it can be made transparent.

(9) L. G. C. writes: I have tried to make a plain gold ring out of an old watch case and broken jewelry, using a mould made of black lead crucible, in two pieces, counter bored in each half to form a cavity the shape I want for a ring, but I can't get the gold to flow so as to fill the mould. I have tried the gold at different degrees of heat, and tried the mould hot and cold. Is there anything I can melt with the gold to make it more of a liquid? A. Your gate is too small and not high enough to give pressure to the flowing metal. If the two parts of the mould are rubbed together very close, the air cannot get out. Clamp them very lightly or cut air vents from the outside of the ring toward the top of the mould. A few drops of oil will make the casting run clean. Put a little flux of soda or borax in the crucible to clear the metal. Heat is all that is required to make the metal liquid. Moulds of soapstone are in common use among jewelers for plain work, and fine sand moulds for pattern work.

(10) J. H. G. says, in answer D. McF. (page 251, No. 12): If he will keep the cloth well dampened with a sponge ahead of his colors all the difficulties will be removed no matter how the color is mixed.

(11) B. H., Jr., of Texas, asks how or where he can find a description of the process of extracting oil from lemon peel. A. Consult U. S. and German Pharmacopoeias; also Spons' "Cyclopedia of Arts" (last edition).

(12) W. P. H. writes: I am using Venetian red paint on wood bowls designed for and covered with rustic work such as hanging baskets, etc. The paint is usually mixed with water for cheapness, but what is better is stale beer. I use it, but neither of above satisfies me, as it does not adhere, but comes off when the bowl is struck, dust fashion. We varnish afterwards, and that aids some in holding in place. Also, how can I get something cheap to varnish the goods with? Cheap varnish is all the goods can stand, in cost say about a dollar a gallon is what is used, but it never dries. I have thought polish of some kind could be produced cheaper. A. Try water glass as a vehicle for your colors (see page 16, vol. xiv.). A cheap shellac varnish is prepared by dissolving six parts of shellac and one of borax in a small quantity of boiling water. Shellac dissolved in wood naphtha also constitutes a good cheap varnish.

(13) J. M. J. asks if a 3/4 inch nut is large enough to hold a 50 inch saw on the arbor; the arbor is 2 inches where the saw goes on. A. The thread on the arbor should be as large as possible, 8 or 10 threads to the inch, 1 1/2 inches thick, with a heavy washer between it and the saw. Both collar and washer should be as large as possible without interfering with the requirements of work to be done. The thread in nut and on arbor should be either right or left, so that any tendency of the saw to slip would screw the nut tighter, according to the way in which you wish the saw to run. Two other ways are used in fastening the washer and saw so as not to turn: key the washer, or put two pins through washer, saw, and collar.

(14) H. F. F. asks: Can you tell me of any solution that will change cast iron in appearance so it will look like brass or green bronze? A. See "Electro-brassing and Bronzing," in SUPPLEMENT, No. 216.