

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 best results are obtained by the Imp. Eureka Turbine Wheel and Barber's Pat. Pulverizing Mills. Send for descriptive pamphlets to Barber & Son, Allentown, Pa.

Steam Tug Machinery, Engines, Boilers, Sugar Machinery. Atlantic Steam Engine Works, Brooklyn, N.Y.

The Genuine Asbestos Liquid Paints are used on the finest and most important structures in this country, and are particularly adapted for first-class dwellings. H. W. Johns Manufacturing Company, 87 Maiden Lane, New York, sole manufacturers.

Rubber Belting, Packing, Hose, and all kinds of manufacturers' supplies. Greene, Tweed & Co., 13 Park Pl., N.Y.

The American Standard Gauge and Tool Works of Philadelphia has consolidated with the Betts Machine Company, of Wilmington, Del. Standard gauges as well as heavy machine tools now in stock.

Magnets, Insulated Wire, etc. Catalogue free. Goodnow & Wightman, 176 Washington St., Boston, Mass.

Cooper Manufacturing Company, Mt. Vernon, Ohio, Manufacturers of Stationary, Portable, and Traction Engines, Saw Mills, Grist Mills, Mill Machinery, etc. Engineers and Contractors. Circular free.

Inexhaustible Beds of Kaolin or Clay.—Wanted experienced pottery men to take an interest in the white, pink, and yellow kaolin beds. Digging and shipping on cars will cost 50 cents per ton. M. J. Dobschutz, Belleville, Ill., Agent.

The New Economizer, the only Agricultural Engine with return flue boiler in use. See adv. of Porter Mfg. Co., page 78.

Employment Wanted.—Tool Maker and Machinist. Can do the best of work. Had charge of men for the past five years. P. O. Box 891, Rome, N. Y.

Forsyth & Co., Manchester, N. H., & 213 Center St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery. Send stamp for illus. cat. State just what you want.

The Electric Light in its Practical Application. By P. Higgs. Numerous Illustrations. \$3.50. Mail free. E. & F. N. Spon, 446 Broome St., N. Y.

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

For Solid Wrought Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

H. Prentiss & Co., 14 De St., New York, Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

For Screw Cutting Engine Lathes of 14, 15, 18, and 22 in. Swing. Address Star Tool Co., Providence, R. I.

The Horton Lathe Chucks; prices reduced 30 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn.

Lincoln's Milling Machines; 17 and 20 in. Screw Lathes. Phoenix Iron Works, Hartford, Conn.

A Cupola works best with forced blast from a Baker Blower. Wilbraham Bros., 2318 Frankford Ave., Phila.

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

Linen Hose.—Sizes: 1½ in., 20c; 2 in., 25c; 2½ in., 29c. per foot, subject to large discount. For price lists of all sizes, also rubber lined linen hose, address Eureka Fire Hose Company, No. 13 Barclay St., New York.

Workshop Receipts for Manufacturers and Mechanics. Illustrated. \$2.00. E. & F. N. Spon, 446 Broome St., N. Y.

Nickel Plating.—A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N.J.

The Lathes, Planers, Drills, and other Tools, new and second-hand, of the Wood & Light Machine Company, Worcester, are being sold out very low by the George Place Machinery Agency, 121 Chambers St., New York.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing Metals. E. Lyon & Co., 470 Grand St., N. Y.

Walrus Leather, Solid Walrus Wheels; Wood Wheels covered with walrus leather for polishing. Greene Tweed & Co., 13 Park Place, New York.

Bradley's cushioned helve hammers. See illus. ad. p. 126.

Excelsior Steel Tube Cleaner, Schuylkill Falls, Phila., Pa.

Vertical Engines. F.C. & A.E. Rowland, New Haven, Ct.

Band Saws a specialty. F. H. Clement, Rochester, N.Y.

Diamond Drills, J. Dickinson, 64 Nassau St., N. Y.

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

Vertical Burr Mill. C. K. Bullock, Phila., Pa.

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

Noise-Quelling Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

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

Solid Emery Vulcanite Wheels.—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

Ornamental Penman's Pocketbook of Alphabets. 32 plates. 20c. Mail free. E. & F. N. Spon, 446 Broome St., N. Y.

For Sale.—United States Patent on Diagonal Churn. Working model on exhibition. Address "Techniker," Room 5, Staats Zeitung Building, New York.

New 8½ foot Boring and Turning Mill for sale cheap. A first class tool. Hilles & Jones, Wilmington, Del.

Manufacturers of Metal Pocket Match Boxes please address Harrison Brothers & Co., Philadelphia, who wish to contract for quantity.

Elevators, Freight and Passenger, Shafting, Pulleys, and Hangers. L. S. Graves & Son, Rochester, N. Y.

Holly System of Water Supply and Fire Protection for Cities and Villages. See advertisement in SCIENTIFIC AMERICAN of this week.

Lathes, Planers, and Drills, with modern improvements. The Pratt & Whitney Co., Hartford, Conn.

Deoxidized Bronze. Patent for machine and engine journals. Philadelphia Smelting Co., Phila., Pa.

Having enlarged our capacity to 96 crucibles 100 lb. each, we are prepared to make castings of 4 tons weight Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Hand Fire Engines, Lift and Force Pumps, for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., and 93 Liberty St., N. Y. city, U.S.A.

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

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

Steam and Gas Fitters' Tools a specialty. Send for circulars. D. Saunders' Sons, Yonkers, N. Y.

NEW BOOKS AND PUBLICATIONS.

AROUND THE WORLD WITH GENERAL GRANT. By John Russell Young. New York: Subscription Book Department of the American News Company. Published in 20 parts. Each 68 pp. 8vo. Illustrated. 50 cents.

Parts I. and II. of this splendid record of travel cover the experiences of General Grant in England. No traveler was ever received with so much distinction by the leaders of thought and action the world over, or ever saw, under more favorable conditions, the best that the civilized world has to offer. The narrative of his journey is cleverly told and lavishly illustrated; and, so far as published, amply fulfills the promise of the publishers to make it the finest record yet printed of a tour of the world. With such a wealth of superior material to choose from Mr. Young could scarcely fail to make an interesting volume; his skill and experience as a journalist left no doubt of his making good use of his opportunities. It is not likely that any other writer will ever have a story to tell involving so many brilliant scenes or containing so much to gratify American pride.

BIRDS OF THE COLORADO VALLEY. By Elliott Coues. Part First, Passeres to Laniidae. Washington: Government Printing Office.

It is rare that a book, more especially an official document, is so much more than it professes to be as this admirable report of Dr. Coues. The value of the bibliographical appendix it is impossible to overestimate. The whole subject of the bibliography of North American ornithology and of the synonymy of North American birds has been worked up anew from the very beginning, every point being verified by personal investigation. It is by far the best work ever done in this department.

THE ART INTERCHANGE. Volume II. January to June, 1879. New York: The Art Interchange Publishing Company. Price \$1.50 a year.

This unpretending but sensible and admirably edited household journal deserves the cordial support of every one who cares for the promotion of the polite arts. It is not only an art newspaper of a fine and discriminating character, but a periodical instruction book giving theoretical and practical lessons in art methods, which will be found of value in every refined household. It is published fortnightly, and each number has twelve pages, with an occasional illustrated supplement.

ORGANIC CHEMISTRY, PRACTICAL AND THEORETICAL. By Hugh Clements. London: Blackie & Son, 16mo, cl., pp. 288.

Specially designed for the students in the Science and Art Department, South Kensington. The descriptive portion appeared originally in a series of articles in the *English Mechanic*, to which has been added some fifty pages on the identification of organic substances, a short chapter on fixed and essential oils, a brief description of apparatus used in this department of chemistry, a list of practical questions and exercises, and eighty or more pages of papers set in organic chemistry at the Kensington examinations (with answers) for the ten years ending 1878.

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.

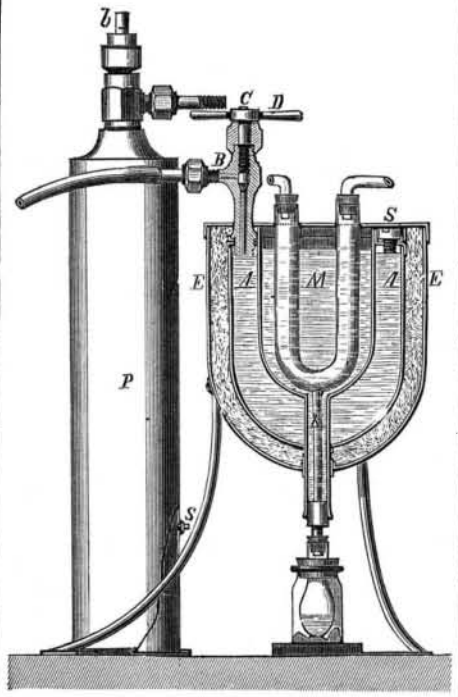
Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) S. S. H. asks: 1. What effect would the explosion of one pound of dynamite, 40 fathoms beneath the surface, have upon the larger fish in the immediate neighborhood? A. Those within the immediate vicinity of the explosion would be killed through the rupture of the air bladder and intestines; they would sink at once to the bottom. Those at a distance would be simply stunned, and would rise to the surface after a time. 2. If the effect is destructive, what would be the probable diameter of the circle of death? A. Perhaps within a radius of 50 yards. 3. Measuring from the surface, to what depth would the concussion be sensibly felt? A. The shock of the explosion would be felt most severely downwards—it is difficult to estimate. The disturbance would reach the surface, but the concussion there would be comparatively slight. 4. Do fish caught in this way become unfit for food; if so, in what way? A. No.

(2) D. H. H. writes: 1. I have been getting up a collection of entomological specimens for the past 3 or 4 years, and I have found that my specimens are eaten by a small grub which spoils a great many of them. I think they must generate in the specimens, as some of them are not exposed to the air. Will you please inform me what I can put on the insect that will prevent these moths hatching and not injure the specimen? Would corrosive sublimate do to paint them with? A. Impregnate the specimens with a solution of arsenious acid in dilute alcohol. See p. 11 (40), volume 38, SCIENTIFIC AMERICAN. 2. Will equal parts of alcohol and water preserve zoological specimens as well as pure alcohol? A. No. 3. Will you please inform me also what is the latest illustrated work published on American insects and reptiles suitable to classify and study up entomological and zoological specimens? A. Consult Packard's "Guide to the Study of Insects," Westwood's "Thesaurus Entomologicus Oxoniensis," Nicholson's Zoology, and Owen's "Vertebrate Animals."

(3) G. M. asks how methyl chloride can be used in the production of ice. A. Methyl chloride, which is used in the manufacture of green and violet aniline colors, was employed for this purpose some years since by Raoul Pictet, and lately Mr. Camille Vincent, of Paris, has used it to produce very low temperature. If compressed methyl chloride is liberated from this overpressure it will begin to boil, and the temperature will fall to -8° Fah. This boiling will then stop, and the fluid methyl chloride will remain quiet without evaporating any further. By means of an air pump the temperature can be reduced to -67°. The small machine that Mr. Vincent uses for this purpose consists of a double walled copper vessel, between which two walls the methyl chloride enters at A. The space, M, contains some non-congealable liquid—alcohol, for instance. The space, E, is filled with some non-conductor of heat, as mineral



wax, etc. B is a stopcock which is opened and closed by turning D. P is a wrought iron receptacle containing the fluid methyl chloride. In order to conduct the methyl chloride into A, the side opening of the receptacle is connected with the rubber hose that is attached to B, the receptacle is raised and its stopcock is opened. That part of the methyl chloride that evaporates escapes through the opening, S. As soon as the temperature has fallen to -8° (the boiling point of methyl chloride), the opening, S, is closed. If it is desired to lower the temperature to -67°, an air pump must be attached to B. In this way a quart of alcohol can be kept at a temperature of -67° for several hours.

(4) U. R. N. G. writes: I have about \$5 gold (pure) dissolved in hydrochloric acid; after acid is dried on fire, the gold is redissolved in solution of bichromate potassium. Do you think it is ready for gilding in electrolyte battery? My battery is bichromate potassium and sulphuric acid for carbon, and weak sulphuric acid for zinc. The matter for gilding is hung on the zinc by a copper wire, and the gold is hung on the carbon by a copper wire. Will that do? If not, how is that done? A. Purify the gold by fusing it with 10 parts of borax glass in a black-lead or French clay crucible; dissolve it by aid of heat in a mixture of 3 parts hydrochloric and 1 part nitric acids, and evaporate the solution cautiously over a water bath nearly to dryness. Proceed as directed under head of "Electro Gilding," p. 2,540, No. 160, SCIENTIFIC AMERICAN SUPPLEMENT. 2. I have a big gutta percha dish, one corner of which is broken; can you tell me how I can repair it? A. Melt together equal parts of pitch and gutta percha, and add ¼ part of powdered shellac. This should be well stirred together. Use hot, and clamp the parts well together until the cement has hardened. 3. How are electrolytes taken from the gelatine mould? A. It is necessary to take a plaster cast of the gelatine mould. From this a positive cast can readily be obtained.

(5) F. N. L. asks how the bright gold and silver lettering is done on glass. A. The size is prepared by dissolving one ounce isinglass in just enough water to cover it; when dissolved add a pint of rectified wine spirit and make up to a quart with water. Give the clean glass a flowing coat of this, and carefully lay on the leaf, which will then readily adhere to the glass. Let it remain 24 hours to dry. The design or letter is drawn on paper, and the lines pricked with needle holes. Place this against the gilded surface and dust it thoroughly with powdered whiting. When the paper is removed there will remain a correct copy of the design or letter on the gold. Now fill up the outline with oil gold size in which has been ground some orange chrome,

thinned somewhat with boiled oil and turpentine. When this has thoroughly dried wash off the surplus gold with water and a piece of cotton wool. Silvering may be done with the leaf, but it is better to use a dry amalgam. See p. 315, Spon's Workshop Receipts.

(6) J. D. M. asks how sperm oil can be divested of its gum and prepared for use on the sewing machine and other delicate machinery. A. Allow the oil to remain in contact with a quantity of lead turnings or clippings for several weeks (usually six weeks is required), then decant and strain through linen or a sand filter. See p. 1670, No. 105, SCIENTIFIC AMERICAN SUPPLEMENT.

(7) F. C. E. asks (1) how to bore a 3x4 inch cylinder for steam engine. A. You can bore it in an ordinary slide lathe, with boring bar and cutter. 2. How to make a permanent deposit of bright silver in desired places which cannot be reached by the hand, on the inner surface of bottles. A. Silver nitrate, 1 ounce; distilled water, 1 pint; strong aqua ammonia, q. s., added gradually to until precipitate, and then redissolve the silver; honey, ¼ ounce. Pour this solution into the bottles, etc., immerse them in water and boil for 10 to 30 minutes, or until properly coated. See article "Silvering Glass," No. 105, SCIENTIFIC AMERICAN SUPPLEMENT. 3. Do most scientists of the present day, who have looked into the subject, believe in phrenology? A. No.

(8) S. E. writes: 1. I wish to turn a block, composed of a number of different kinds of wood; what is best to glue them with? I also wish to glue very thin strips of wood to linen; what is the best glue for the purpose? A. A fine animal glue is as good as anything for these purposes. 2. Where can I get an automatic tide register, and about what would one cost? A. Insert an advertisement in "Business and Personal" column. 3. How many people have obtained American patents? A. See the numbers in patent list on another page.

(9) H. L. B. asks: What size of steam pump would be required to force water through a 3 inch main a distance of 3,000 feet, with 50 feet elevation at end? A. You can use any size of pump you please; it must be determined by the quantity of water you wish to lift in a given time.

(10) H. M. H. asks: 1. What pressure of steam will a boiler stand made like the one described in SUPPLEMENT, No. 182, page 2891? A. If well put together, 150 lbs. per square inch. 2. Where should the water stand in it? A. One to two inches below top of lower flasks.

(11) W. M. asks: 1. Will a boiler of 20 inches diameter, 20 inches high, ¼ inch iron, hold 350 lb. of steam to the square inch? A. Make it at least 5-16 inch thick. 2. How thick should the cylinder be, 3½ inch bore, by 6 inch stroke, to make 400 revolutions per minute, boiler pressure 300 lb.? A. ¼ inch when finished.

(12) C. J. B. asks: What is the greatest depth in which any submarine diver has successfully operated? A. We think about 120 feet, at a wreck on Lake Erie.

(13) W. G. R. asks (1) how to make a preparation to dip packages in to give them a coating that will keep them waterproof and airtight, packages covered with brown paper. A. You may try the following: Shellac, 4 parts; borax, 1 part; water, q. s., to form on boiling a very thin sirup. If required to dry very quickly, use hot. Or use a solution of shellac in wood naphtha containing a small quantity of boiled oil. 2. What will make a good cheap washing crystal? How is bluing put in washing crystal, and what kind of blue is used? A. "Washing crystal" is common commercial carbonate of soda, subcarbonate of soda. The bluing is either ultramarine or aniline blue (BB), added during the crystallization. 3. Can you get me a compound analyzed of a vegetable kind and tell me what it contains, and what would be your charge? A. Yes; the cost depends upon the nature of the compound.

(14) W. S. J. asks: 1. Which is the best deep sea sounding apparatus in use? A. That used by the United States Coast Survey. 2. What are its defects? A. This is probably as near perfect as any in use.

(15) W. asks: What acid can be used (if any) in making a monogram type upon copper, to eat away the surplus metal, leaving the letters stand out in relief, and the surface smooth? Please describe the process or give some other good method. A. Use nitric acid diluted with about 3 volumes of water. Cover the portions to remain untouched with paraffine. The sand blast may be advantageously used instead of acid in some cases.

(16) Our correspondent C. N. writes: Is it known what is the actual difference in the amount of fuel required to run a stationary boiler (doing substantially the same work) in winter as against the summer season, caused by the difference in temperature alone? Perhaps some of your readers can give the amount of fuel that was required to run a boiler that was exposed to the weather, for each of the twelve months, doing comparatively the same service. The result of a twelve months' performance of a small portable engine and boiler, used for sawing wood, would be a fair test, as the exposure of it to atmospheric changes would be unquestionable. [Perhaps some of our readers will be able to furnish the information desired by C. N.]

(17) F. B. asks: 1. In the dynamo-electric machine described in SUPPLEMENT 161, can the cores of the electro-magnets be cast of common cast iron, or would that be too hard? A. Soft cast iron will do. 2. How long ought a bichromate battery work without attention? A. It depends on how much is required of it. Ordinarily two weeks. 3. What is vulcanite? A. Hard rubber.

(18) A. M. W. asks: What metallic or non-metallic substance, heated to a red or white heat, will retain that degree of heat longest after it has been removed from within the flame, and which with an occasional use each day will probably sustain the injurious effects of the flame longest without requiring to be replaced? A. Common fire brick will probably answer your purpose best.