

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.

Machine Tools.—We now have in stock, ready for instant delivery, part at our N. Y. warehouses and a portion at our works, Manchester, N. H., the following new machine tools, which we offer at the below-named exceptional prices. All modern, latest patterns, lathes, screw cutting, rod feed, power cross feed, 20 in. and under, with hollow spindle. 14 and 16 ft. x 26 in., with compound rest. viz.: Engine Lathes.—2-16 ft. x 26 in., \$786 each; 3-14 ft. x 26 in., \$750 ea.; 1-16 ft. x 20 in., compound rest, \$522; 2-10 ft. x 20 in., \$449 ea.; 2-8 ft. x 20 in., \$425 ea.; 1-12 ft. x 18 in., compound rest, \$455; 2-12 ft. x 18 in., \$435 ea.; 2-10 ft. x 18 in., \$415 ea.; 3-8 ft. x 18 in., \$395 ea.; 3-6 ft. x 18 in., \$375 ea.; 1-7 ft. x 17 in., \$369; 1-6 ft. x 17 in., \$350. Drill Presses.—2-32 in. back geared and self feed, \$365 ea.; 1-30 in., back geared, \$325; 2-28 in., back geared, \$280 ea.; 2-24 in., \$185 ea.; 3-20 in., \$150 ea.; 2-18 in., \$110 ea. Iron Planers.—7 ft. x 32 in. x 25 in., \$775; 4½ ft. x 24 ft. sq., \$575; 4 ft. x 24 in. sq., \$500. Heavy combined punch and shear, \$950; 15 in. shaper, \$450; 6 in. shaper, \$135; milling machine, \$225; 48 in. radial drill, \$750; No. 1-7 spindle Durrell nut tapper, \$300; No. 2-7 spindle Durrell nut tapper, \$350. In addition we have an immense assortment of new and second-hand machine tools, engines, boilers, and pumps, woodworking and general machinery; fully described in our catalogues 29, 30, and 31, which we mail free on application. S. C. Forsyth & Co., machinists and general machine dealers, Manchester, N. H., and 209 Center St., New York city.

Hand Saw Manufacturers address John E. Tyler, Roxobel, Bertie Co., N. C.

Water Motor and Electric Light Machinery for sale at a low price. See advertisement on page 284.

I will invest in a good thing, part or whole. Address, with particulars, or no answer, 21 Park Row, Box 387, N. Y.

Excelsior Metallic and Steel Tapes, the best article made. General Depot, Keuffel & Esser, New York.

Sheet and cast brass goods, experimental tools, and fine machinery. Estimates given when models are furnished. H. C. Goodrich, 66 to 72 Ogden Place, Chicago.

American Fruit Drier. Free Pamphlet. See ad., p. 270.

Am. Twist Drill Co., Meredith, N. H., make Pat. Chuck Jaws, Emery Wheels, Grinders, automatic Knife Grinders.

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

Peck's Patent Drop Press. See adv., page 268.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

Drop Forgings. Billings & Spencer Co. See adv., p. 270.

Brass & Copper in sheets, wire & blanks. See ad. p. 269.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 20,000 Crank Shafts and 15,000 Gear Wheels now in use, the superiority of their castings over all others. Circular and pricelist free.

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

Machine Diamonds, J. Dickinson, 64 Nassau St., N. Y.

Eagle Anvils, 10 cents per pound. Fully warranted.

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 268.

Garmore's Artificial Ear Drums for relief of partial or entire deafness. Invented by one who has been deaf thirty years. Simple and scientific in construction; not observable in use. Send for circular. John Garmore, S. W. cor. 5th and Race Sts., Cincinnati, O.

Pays well on small investment.—Stereopticons, Magic Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday-schools, and home amusement. 116 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., N. Y.

Sewing Machines and Gun Machinery in Variety. The Pratt & Whitney Co., Hartford, Conn.

Catechism of the Locomotive. 625 pages, 250 engravings. Most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for catalogue of railroad books. The Railroad Gazette, 73 B'way, N. Y.

Improved Skinner Portable Engines. Erie, Pa.

Common Sense Dry Kiln. Adapted to drying of all material where kiln, etc., drying houses are used. See p. 270.

Trevor's Patent Key Seat Cutter. Trevor & Co., Lockport, N. Y. See page 269.

Lubricator. See advt., Detroit Lubricator Co., p. 252.

Engines, 10 to 50 horse power, complete, with governor. \$260 to \$550. Satisfaction guaranteed. Nearly seven hundred in use. For circular address Heald & Morris (Drawer 127), Baldwinville, N. Y.

Pat's Mfg'd on royalty. A. B. McCool, Pottsville, Pa.

The Sweetland Chuck. See illus. adv., p. 254.

Steam Pumps. See adv. Smith, Vaile & Co., p. 252.

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

Calcium Light Apparatus and Stereopticons at low prices. C. Beseler, 218 Centre Street, New York.

Bostwick's Giant Riding Saw Machine, adv., page 238.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 236.

See New American File Co.'s Advertisement, p. 238.

Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 238.

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

Red Jacket Adjustable Force Pump. See adv., p. 220.

Collection of Ornaments.—A book containing over 1,000 different designs, such as Crests, Coats of Arms, Vignettes, Scrolls, Corners, etc., will be mailed free on receipt of \$1. Address Palm & Fechteler, 6 West 14th Street, New York.

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

Pure Water furnished Cities, Paper Mills, Laundries, Steam Boilers, etc., by the Multifid System of the Newark Filtering Co., 177 Commerce St., Newark, N. J.

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

First Class Engine Lathes, 20 inch swing, 8 foot bed, now ready. F. C. & A. E. Rowland, New Haven, Conn.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 143 Greenwich Street. P. O. Box 3088, New York city.

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.

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

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

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

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

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

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

Presses & Dies (fruit cans) Ayar Mach. Wks., Salem, N. J.

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

NEW BOOKS AND PUBLICATIONS.

A SUPPLEMENT TO GRIMSHAW ON SAWS. By Robt. Grimshaw. Philadelphia: E. Claxton & Co. 8vo, cl. pp. 120. \$2.

The first part of Mr. Grimshaw's work was noticed in these columns some months ago. The new part contains material, chiefly relating to saw blades, which has come to hand since 1880. The new illustrations number about a hundred.

CONSTITUTIONAL HISTORY AND POLITICAL DEVELOPMENT OF THE UNITED STATES. By Simon Sterne. New York: Cassell, Petter, Galpin & Co.

An unpretending work, sketching the development of American institutions in a matter-of-fact way, and discussing somewhat dryly the merits, faults, and failures of our political methods. While we cannot agree with the author on some disputed points of public policy we can heartily commend his work generally to popular favor. The information given should be of interest to every citizen.

FOR GIRLS: A SPECIAL PHYSIOLOGY. By Mr. E. R. Shepherd. New York: Fowler & Wells.

Most girls are allowed to go in ignorance of their special organs and functions, to pick up, sooner or later, by tradition or otherwise, an amount of misinformation not at all conducive to their physical and moral health. Even when formally taught anatomy and physiology the instruction always leaves out those matters about which correct knowledge is most needed. The author's aim is to present the lacking information in a wholesome way, and to supplement it with good advice touching personal hygiene, dress, conduct, and so on. The spirit of the little book is admirable, and its execution fairly good.

REPORT OF THE NEW YORK STATE SURVEY FOR 1880. James T. Gardiner, Director. Albany: Weed, Parsons & Co.

Describes the method of marking trigonometrical stations in the State Survey, and tabulates the approximate geographical positions of the stations of the central chain of primary triangles across the State. The survey finds existing maps exceedingly inaccurate. The most notable result of the year's work is the completion of the first accurate measurement across the State from the extreme western boundary, near Lake Erie, to the Massachusetts line. The width of the State between these points is 326.46 miles—2¼ miles less than the best maps make it. This makes a difference of from 300 to 400 square miles in the area of the State.

THE ODYSSEY OF HOMER. Done into English prose by S. H. Butcher and A. Lang. New York: Macmillan & Co. \$1.00.

The translators' aim has been to make a truthful rendering of the story of Odysseus in simple English prose. The studied simplicity of the style adopted comports well with the story, though the language lacks at times the flexibility and rhythm of genuine English. As a faithful translation the work has been received with much favor in England, this edition being the third. The publishers' part is uncommonly well done for the price.

HISTORY OF WOMAN SUFFRAGE. Edited by Elizabeth Cady Stanton, Susan B. Anthony, and Matilda Joselyn Gage. Vol. II. New York: Fowler & Wells. 8vo., cl., pp. 952. \$5.00.

The second volume of this monumental history of the efforts of women to secure for women legal and political rights corresponding to those of men, covers the period between 1861 and 1875. A considerable part of it is devoted to the national services rendered by women during the civil war. A third volume is promised in 1884.

A SOLUTION OF THE PYRAMID PROBLEM; OR PYRAMID DISCOVERIES, WITH A NEW THEORY AS TO THEIR ANCIENT USE. By Robert Ballard. New York: John Wiley & Sons.

The author writes as an engineer, and is curiously free from the religious, astrological, or other more or less fantastic whims of ordinary pyramid solvers. He presents with a good deal of cogency the theory that the pyramids were erected as a system of landmarks for the establishment and periodical readjustment of the land holdings of the people. The pyramid builders may have made the entombment of their kings one of their exoteric objects, he admits, thus playing on the morbid vanity of their rulers to induce them to the work; but their primary purpose was to make use of these structures in land surveying. The manner in which the pyramids may have been used as great theodolites, to be observed from a distance, is clearly shown.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

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

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

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

(1) R. D. asks: Will you please inform me what is used to darken bronze? I have the bronzecastings, and want to finish them like the bronze bell pulls and door trimmings we buy at the hardware stores. It is called dark or Berlin bronze. Also how to make a good lacquer for bronze? A. Cleanse the metal by dipping it first momentarily in nitric acid, then rinsing quickly in running water, and rubbing with sandst. The bronzing dip may be prepared by dissolving in a gallon of hot water 1½ lb. each of perchloride of iron and perchloride of copper. The metal should not be allowed to remain in this dip any longer than is necessary to produce the desired color. Rinse well, dry, and polish in warm sawdust or with a rag buff. To make a bronze lacquer, dissolve ½ lb. of shellac and ½ lb. sandarac in 3 quarts of alcohol, and add enough extract of dragon's blood and turmeric to produce the desired color.

(2) J. K. asks: Is there a way to prevent wood in the form of a box 4 ft. 6 in. x 20 in. from warping on change of temperature? A. The only remedy we know of is to use thoroughly seasoned wood, and to so construct the box that one part will restrain any tendency of another to warp by "dove-tailing," battening, or crossing the grain. There is nothing of a chemical nature that will prevent warping in wood.

(3) D. C. asks: 1. How is the bright brass plating applied to the cast iron buckles of suspenders? A. See "Electrometallurgy," in SUPPLEMENT No. 310.

(4) F. C. writes: After inserting a small gas pipe through some Scotch water gauge glasses, and letting them lie over night, I found several broken in the morning. Being told that it was caused by the iron touching the glass, I covered the gas pipe with paper, but with the same result. The breakage was not due to any strain, as the piping fits very loosely in the tubes. Could you give any reason for such results, and what I should do to prevent it? A. Scotch glass water gauge tubes, like other glass tubing, is not annealed, or may be only partially annealed, which leaves the glass with an uneven tension strain; and from experiments made for testing these conditions, we are led to believe that the inner surface has a strain tending to pull it apart, and the outer surface has a strain of compression. These conditions are due to the unequal cooling of the two surfaces. The outside cooling the fastest, compresses the inner surface while it is plastic from heat, and then sets; the inner surface cooling last or slowest, continues to shrink after the outside is set, and thereby induces a tensional strain upon the inner surface. The facts that sustain this theory are these: you may scratch, file, or rub the outside of these glasses with impunity; but if you scratch the inside or touch it with anything that produces the least scratch, even if you cannot see it, the chances are that the tube will show the crack in a short time. These tubes can be cleaned with a small pine stick and cotton wad with safety; but if you undertake to clean them with a piece of iron pipe or rod covered with a peroxide scale that is almost as hard as emery, you can hardly expect better results than you have experienced. The paper that was put upon the iron tube may itself have had particles of grit or sand upon it, that produced an imperceptible scratch.

(5) H. O. writes: Will you please inform me of a varnish and the process of making it, that I could varnish some ornaments that I have bronzed with gold colored bronze? The method I used to put the bronze on was to paint the article, which is cast iron, with white paint, which is white lead and oil; when hard dry, varnish with copal varnish; when sticky dry, dust the bronze powder over it; and when hard dry, brush off all the superfluous bronze with a camel's hair brush. What I would like to know is how to protect it from the dust and from soiling. Is my process correct? A. Coat the bronzed surface, when dry, with spirit copal varnish. Your process is correct.

(6) C. S. asks: How is glucose manufactured? Do you think I could make it from sweet potatoes? What would it cost to make it on a small scale? A. You will find comprehensive papers on glucose and its production in SUPPLEMENTS, Nos. 96, 259, and 260. It can be prepared from the yam, but more profitably from corn or cassava.

(7) J. S. L. asks: What material (not acted on by caustic soda) can I use to make non-porous the lower portion of porous cell used in the "cheap electric pile," mentioned in SCIENTIFIC AMERICAN, Aug. 5, page 86? A. Try plaster of Paris, filled after "setting" with melted paraffine.

(8) G. A. F. asks: What will make the best oak stain to apply to pine finish, and how should it be applied? A. Tincture of turmeric (curcuma) five ounces;

dragon's blood half an ounce; alcohol three parts. Rub the dragon's blood to a thin paste, with a very small quantity of boiling water in a hot mortar, then add the alcohol, and finally the yellow tincture, mixing all well together. Let the mixture stand for eight hours in a covered vessel, and strain through a cotton cloth for use. Apply with a brush, adding wine spirit if too dark.

(9) W. A. M. writes: I have a rope, with hook attached, running over a pulley which I use for hoisting light packages of merchandise from the ground to the second and third floors of a building. The rope is exposed to sun and rain. Please tell me how to treat it so that it will not rot out, as I find the action of the weather soon destroys it. A. Digest the rope for several hours (or over night) in warm dead oil (a cheap product of the distillation of tar).

(10) J. B. writes: I am about to lay an iron pipe 10 inches diameter, made of plates about three-sixteenths of an inch thick, across the street underground to my boiler shop, for the purpose of transmitting blast to the forges. Will you kindly inform me through the medium of your paper what would be best to use in the way of paint to prevent injury to the pipe from rust or corrosion? A. Dissolve genuine asphaltum in oil of turpentine; give the pipe two good coats of this, allowing the first to dry before the second is applied. See that the pipes are quite dry before putting on the varnish.

(11) H. L. D. asks: Is there any remedy for falling hair, or any preparation that will cause a new growth of hair? also the cause of and how to remove dandruff? A. See "Hygiene of the Hair," by Prof. Erasmus Wilson, in SUPPLEMENT No. 102, and "Baldness," by Geo. H. Rohe, in SUPPLEMENT No. 161.

(12) A. H. J. asks: Can you suggest some way of making paper transparent? I have tried soaking it in machine oil with results not satisfactory. A. We know of no way of making paper transparent. It may be made translucent by saturating it with castor oil or bleached balsam.

(13) W. G. B. asks: Can you give me directions for putting a high polish on ebony, one that will be durable? A. Give the work two coats of fine copal varnish, and rub this down (when dry) quite smooth with fine pumice stone; put on a third coat of the same, and rub down with rotten stone; clean and put on a flowing coat of best spirit copal varnish, and when this has become quite dry, polish with chamois skin and the palm of the hand. 2. Also for a mixture to dye pine to a dark walnut color. A. Dissolve in a pint of water two ounces of sal soda, heat to boiling, add three ounces of dichromate of potash and eight ounces of Vanduyke brown, with enough water to reduce to the proper consistency for use with a flat brush or rubber. Use the stain hot, and not too concentrated. This, when dry, takes varnish or oil very well.

(14) J. L. B. writes: In SCIENTIFIC AMERICAN of May 20, page 323, answer to J. H. Z., No. 22, you give receipt for starching collars, cuffs, etc. Allow me to ask: 1. Should the goods when starched be treated as when ordinary starch is used? A. Yes. 2. Do you mean a common sardiron when you say "use a polishing iron?" A. No; the polishing iron is usually smaller than the ordinary sardiron, and has all the face edges well rounded, so as to admit of a burnishing action, in which the full pressure is brought to bear on a small area, thus developing a gloss not easily obtainable by other means.

(15) H. C. asks: At what temperature the alloy, note 14, page 139, current volume, melts? A. At about 210° Fahr. The receipt should read: "lead 1½ parts, cadmium ½ part," etc.

(16) E. B. S. asks: Will you please tell me the best way to prepare the Irish potato for the purpose of cleaning, particularly for cloth and silk? A. The potatoes are simply washed and reduced to a fine pulp by grinding. See "Potatoes and their Utilization," page 229, vol. xiv.

(17) D. E. S. asks: 1. Can you tell me how much pressure a boiler made of 14 inch lap-welded wrought iron pipe will stand? Do you think it would stand 500 pounds to the square inch? If not, how much will it stand? It is a good quality of pipe. A. We believe they are proved to only 300 pounds per square inch. Pipe can of course be made, and has been made, to stand much more than 500 pounds. 2. Do you think cast steel is as good for boiler heads as wrought iron, that is, to insert two-inch flues in? Will it expand more than wrought iron? I mean such as the Chester steel casting, as cast at Chester, Delaware Co., Pa.? Would it not make good heads for small 14 inch boilers with about twelve 2 inch flues? If not as good, is it not nearly as good? A. Yes, if soft or low steel, difference of expansion and contraction being very slight. 3. How much pressure will 2 or 2½ inch steam pipe stand, outside pressure, that is, used for flues? A. We do not know of actual tests, but it will stand much more than any pressure used ordinarily in steam boilers. Locomotives use pressures up to 150 to 200 pounds. 4. Do you think the heads could be put into 14 inch pipe so as to hold as much as any part? A. Yes, if properly done.

(18) J. E. D. asks: Can I use an upright tubular boiler for heating the room in which it stands, another adjoining on the same level, and one over both? The trouble I apprehend is to return the water from lower coils to the boiler. Could I warm lower rooms by flow of hot water, and upper one by steam? Can I run a small engine, say, four or five horse power, in a block of buildings in an unincorporated village without a licensed engineer? A. There would be difficulty in returning the water from coils on rooms and on the same floor as the boilers. The condensed water would have to be trapped into a cistern and pumped back into the boiler or returned by an injector. We think that under the State law you must have a licensed engineer.

(19) G. N. asks: What is used by brass finishers to give that peculiar luster to their work? I have been told it was some kind of acid? A. The luster given to brass work other than by finishing and polishing is produced by acids and then lacquered. A