

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.

Best Squaring Shears, Tinners', and Cannery Tools at Niagara Stamping and Tool Company, Buffalo, N. Y.

Lewis' Combination Force Pump makes three machines made of brass throughout. See Adv. page 317.

Saw Mills, Hauck & Comstock, Mechanicsburg, Pa. Wanted, Superintendent for Malleable Iron Works. Address "Y," P. O. Box 773, New York.

Wanted, man who understands making the mandrels, and turning all kinds of furniture springs; give reference and experience. Address A. B., P. O. Box 3,621, New York.

Am. Twist Drill Co., Meredith, N. H., make Pat. Chuck Jaws, Emery Wheels, Grinders, automatic Knife Grinders. American Fruit Drier. Free Pamphlet. See adv., p. 318.

Drop Forgings of Iron or Steel. See adv., page 316.

Brass & Copper in sheets, wire & blanks. See ad. p. 318.

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 price list free.

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

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

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 317.

Gear Wheels for Models (list free); Experimental Work, etc. D. Gilbert & Son, 312 Chester St., Phila., Pa.

Drop Hammers, Power Shears, Punching Presses, Die Sinks. 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.

20,000 Duc Spherical Elevator Buckets, sizes 3 1/4 to 17 inches, constantly on hand. Telegraphic orders filled. T. F. Rowland, sole manufacturer, Brooklyn, N. Y.

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

Catalogues free.—Scientific Books, 100 pages; Electrical Books, 14 pages. E. & F. N. Spon, 44 Murray St., N. Y. Straight Line Engine Co., Syracuse, N. Y. See p. 317.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 300. For Mill Mach'y & Mill Furnishing, see illus. adv. p. 300. See New American File Co.'s Advertisement, p. 302.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 302. Woodwork'g Mach'y. Rolstone Mach. Co. Adv., p. 300.

Steam Pumps. See adv. Smith, Vaile & Co., p. 300.

Stenographers, type-writers, clerks, and copyists may be obtained free of charge at the Young Women's Christian Association, 7 East 15th Street, New York.

Ejector Condenser for Steam Engines or Vacuum Pans. J. L. Alberger, Buffalo, N. Y.; or T. Sault, New Haven, Ct. Lathes 14 in. swing, with and without back gears and screw. J. Birkenhead, Mansfield, Mass.

Five foot planers, with modern improvements. Geo. S. Lincoln & Co., Phoenix Iron Works, Hartford, Conn. The Best.—The Dueber Watch Case.

If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent Agency, 261 Broadway, New York.

Curtis Pressure Regulator and Steam Trap. See p. 236.

The Celebrated Wooton Desk. See adv., page 236.

Lightning Screw Plates, Labor-saving Tools, p. 286.

Wanted.—Patents or the right to manufacture the articles on royalty. Give full particulars. Cuts, drawings and specifications will be returned, if not in our line, on request of parties sending same. Lock Box 35, West Troy, N. Y.

Farley's Directories of the Metal Workers, Hardware Trade, and Mines of the United States. Price \$3.00 each. Farley, Paul & Baker, 530 Market Street, Phila.

Correspondence solicited from parties desiring brass or bronze castings. Special facilities for large and heavy work. Lock Box 35, West Troy, N. Y.

Improved Skinner Portable Engines. Erie, Pa.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Steam Pumping Machinery of every description. Send for catalogue.

Boiler Scale.—Parties having fine specimens for sale or loan, address Jas. F. Hotchkiss, 84 John Street, N. Y.

Permanent Exposition.—Inventors' Institute, Cooper Union, N. Y. City. Every facility for exhibition of machinery, merchandise, and inventions. The expense is small—the advantages great. Send for particulars.

Contracts taken to manuf. small goods in sheet or cast brass, steel, or iron. Estimates given on receipt of model. H. C. Goodrich, 66 to 72 Ogden Place, Chicago.

Nickel Plating.—Sole manufacturers cast nickel and nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Lists 29, 30 & 31, describing 4,000 new and 2d-hand Machines, ready for distribution. State just what machines wanted. Forsaith & Co., Manchester, N. H., & N. Y. city.

"Abbe" Bolt Forging Machines and "Palmer" Power Hammers a specialty. Forsaith & Co., Manchester, N. H. Railway and Machine Shop Equipment.

Send for Monthly Machinery List to the George Place Machinery Company, 121 Chambers and 103 Reade Streets, New York.

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

"How to Keep Boilers Clean." Book sent free by James F. Hotchkiss, 84 John St., New York.

Engines, 10 to 50 horse power, complete, with governor, \$250 to \$550. Satisfaction guaranteed. More than seven hundred in use. For circular address Heald & Morris (Drawer 127), Baldwinville, N. Y.

Wanted.—Patented articles or machinery to make and introduce. Gaynor & Fitzgerald, New Haven Conn.

Water purified for all purposes, from household supplies to those of largest cities, by the improved filters manufactured by 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. For Power & Economy, Alcott's Turbine, Mt. Holly, N. J.

Ice Making Machines and Machines for Cooling Breweries, etc. Pictet Artificial Ice Co. (Limited), 142 Greenwich Street. P. O. Box 3083, New York city.

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

Machinery for Light Manufacturing, on hand and built to order. E. E. Garvin & Co., 139 Center St., N. Y. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

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.

NEW BOOKS AND PUBLICATIONS.

REPORT OF THE CHIEF OF ORDNANCE FOR 1882. Government Printing Office.

In this summary of the condition of his department for 1882, General Benet speaks of the Springfield breach loading rifle as having no superior for army uses, and expresses the belief that it will hold its place until it is superseded by a magazine gun. Of this class of rifles submitted for examination there were forty guns, representing different systems of detachable and fixed magazines. After tests extending over a period of fifteen months, only three were recommended as "suitable for military service"—the Lee, the Chaffee-Reece, and the Hotchkiss. In view of the appointment of a select committee on heavy ordnance for the navy and sea coast defenses, General Benet says that "full power" guns must be made of steel. An improvement on the present ordnance can be made, however, by using cast iron guns with a rifled tube of steel, the barrel to be wound exteriorly with steel wire. He doubts if steel guns can at present be produced in this country—guns of the requisite caliber made entirely of steel—as we have neither the suitable plant nor the means of producing the steel in the necessary masses. He suggests either the establishment of a national foundry, or encouragement to private foundries to procure the necessary plant and experience. The report is illustrated with plates and contains several instructive and useful tables.

TECHNOLOGISCHES WORTERBUCH—TECHNOLOGICAL DICTIONARY—IN ENGLISH AND GERMAN. Gustav Eger, Brunswick. Frederick Vieweg & Son, B. Westermann & Co., 388 Broadway, New York city.

This is an octavo volume of over 700 pages containing words, terms, and phrases, of a colloquial and technical character, giving the German equivalent for the English subject. Among the titles are: Architecture, ship-building, railways, roads, bridges, mechanics, manufacture, agriculture, navigation, mining, and the sciences connected with the arts. The volume makes a valuable and convenient reference book.

THROUGH ONE ADMINISTRATION. Frances Hodgson Burnett. Boston: James R. Osgood & Co.

Those who have patiently accepted the installments of this story as they have periodically appeared, may be glad to have it in complete and usable form for ready reference; for, unlike some writings which are only stories, the delineations of character and relations of incident by this author invite a revision and re-reading. Those who have not yet read this attractive novel will now be paid for their reticence by the appearance of this volume, which is of just a handy size for the traveling bag or reticule, and adapted to the inviting laziness of the seashore or the cool silence of the forest.

DEEP BREATHING AS A MEANS OF PROMOTING THE ART OF SONG, AND OF CURING WEAKNESSES AND AFFECTIONS OF THE THROAT AND LUNGS, ESPECIALLY CONSUMPTION. Sophie Marguise A. Ciccolina; from the German by Edgar S. Werner. New York: M. L. Holbrook & Co.

The object of this little treatise is to restore as an art a perfectly natural physiological habit, that of deep breathing, or of inflating the abdomen as well as the lungs with atmospheric air. The directions are the results of efforts made to restore a lost voice, to enable one with natural vocal powers to sing. She claims that the public life of artists can be greatly prolonged, that persons of "weak" voice can become singers, that the general health can be improved by a voluntary practice of deep breathing, such as is seen in the sleeping infant and in the adult when excited by coughing, retching, etc. The ultimate result of this practice, on the author, and its good effects on others, who adopted it by her advice, seem to be conclusive as to its benefit. These facts are contained in a small volume of about fifty pages, to which our readers are referred for the *modus operandi*, which is illustrated by diagrams.

A MANUAL OF PHOTOGRAPHIC CHEMISTRY, THEORETICAL AND PRACTICAL. By Rev. T. Frederick Hardwich, M.A. Ninth edition. Edited by J. Traill Taylor, Ed. *Photographic Times*. New York: Scovill Manufacturing Co., 419 Broome Street.

The usefulness of this treatise as a manual for photographers may be inferred from the publication of a ninth edition. In addition to its information for the professional and the amateur photographer, this volume contains, also, an interesting history of photography and a chapter of outlines of general chemistry. In its descriptions of the details of the practice of photography, this manual does not confine itself to one method, but gives several processes and explains the reasons why some, or one, should be preferred.

MYSTERIES OF TIME AND SPACE, WITH TWENTY-FOUR ILLUSTRATIONS. Richard A. Proctor. New York: R. Worthington, 770 Broadway.

This is the title of a collection of twenty-four essays by Mr. Proctor, the well known popular writer and lecturer on astronomy. That they are intensely interesting need not be stated to those who have either heard Mr. Proctor's public addresses, or who have read only the newspaper reports, which have necessarily been abstracts, or at most merely synoptical. Mr. Proctor has a faculty of presenting the results of wearisome calculations, not merely in dictatorial statements, but with a foundation of mathematical and historical fact that carries conviction. For instance, in the opening essay he elucidates the astronomical fact of the gradual retardation of the period of the earth's rotation, by history and observation, so that what might before have been accepted as a true statement becomes appreciated as a proved fact. In his essay on the "Birth and Death of Worlds," Mr. Proctor finds actual illustrations in the solar system of the five stages, earth at present occupying the middle or third one. The sun represents the first stage of planetary life, that of existence in the form of vapor—the hardest minerals and most obscure metals being held in a gaseous, glowing state by intense heat. Jupiter is an example of a world the nucleus of which has become solid, but which holds its oceans suspended in its atmosphere. Jupiter is in the second planetary life stage and will not be in the third, or earth stage, for 240 millions of years. The earth represents the third, or life-producing stage. Mars is in old age, or decrepitude; and the moon is essentially a dead world, a condition which earth will reach in about 200,000,000 years.

THE POSSIBILITY OF NOT DYING; A SPECULATION. Hyland C. Kirk. New York: G. P. Putnam's Sons.

This little volume of scarce more than 100 pages attempts to give some speculations on the possibility of a continuous physical existence. The "speculations" are curious and interesting, and whatever they may tend to prove or disprove, the writer appears to be animated by his statement in the preface: "The chief conservator of morality in this life is religion. No one, therefore, has the right to attempt the destruction of those barriers which protect society, unless he has stronger methods of defense to substitute therefor."

THE FRENCH FOREST ORDINANCE OF 1669; WITH HISTORICAL SKETCH OF PREVIOUS TREATMENT OF FORESTS IN FRANCE. John Crombie Brown, LL. D., Compiler and Translator. Edinburgh: Oliver & Boyd.

Dr. Brown has given a valuable history of the sylvan property in France, from the earliest times, in a neat volume of less than 200 pages. The object is to give practical information on the subject of the value and use of standing forests; how they may be utilized for the needs of man without being destroyed, and how they may be restored where the country has been left bald by their destruction. There are portions of this country that need the benefits of such intelligent instruction as this compilation affords.

THE CENTURY. Vol. XXV., from November, 1882, to April, 1883. The Century Company, New York.

An elegantly bound volume of between 900 and 1,000 pages looks as little like the monthly visitor that we know as *The Century* as the mature "cock of the walk" looks like the hatching dozen of eggs. The fine letter press and exquisite engravings seem much finer and more exquisite in solid backs, and *en masse*.

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 the 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) O. A. T.—To make a furniture polish, take turpentine (oil), one pint; alkanet root, one half ounce; digest until the liquid has become sufficiently colored; then add beeswax, scraped fine, four ounces; put the vessel into hot water and stir the contents until a homogeneous mixture is obtained. If wanted pale, the alkanet root should be omitted. 2. White: white wax, one pound; liquor of potassa, two quarts; boil to proper consistence.

(2) S. M.—The Chinese method of laundrying shirt bosoms, etc., is thus described: A rather thick starch paste is prepared by first beating up a handful of raw starch (usually cornstarch) and a teaspoonful of fine rice flour with about one quart of water, making a liquid of cream-like consistence. A certain quantity (determined alone by personal experience) is poured into a quantity of boiling water while the latter is vio-

lently stirred with a short wooden spatula. With this the portions of the linen to be dressed are well smeared (the linen moist from wringing and the starch quite hot). Thus smeared the pieces are laid aside for a few minutes, then rubbed well between the hands, so that the paste is well distributed in the fabric. The linen is then usually dried by artificial heat. When ready for ironing, the starched portions are dampened by means of a cloth dipped in raw starch water to which has been added a small quantity—about half an ounce to the quart—of blood albumen—clarified serum of bullock's blood. The proportion of starch in this water is usually about as one to fifty of water. In ironing, the irons are first made very hot, and cooled somewhat externally just before using by momentarily plunging them into a pail of water. The irons commonly employed are what are termed polishing irons—they have the posterior edge rounded instead of angular, as in the ordinary smoothing or sad iron. Much of the fine gloss observed on shirts laundered by Chinamen is accomplished by the skillful manipulation of this "rounded edge" over the work—a manipulation very difficult to describe in words. It is most laborious work for those not accustomed to it. It not only renders the surface glossy, but imparts easy flexibility to the heavily starched fabric otherwise not attainable. Custom made shirts are usually laundered before delivery in trade at the factory, the ironing in these cases being largely performed by steam mangles, though some are hand finished. The following receipt for a laundry starch is said to produce a very fine and lasting gloss on linen without the expenditure of the amount of labor in ironing usually requisite to produce a fair appearance:

- Corn starch 1 ounce.
Water, boiling 1 1/2 pints.
Bluing q. s.

To this when it has cooled somewhat is added and thoroughly mixed in about half an ounce of the following preparation:

- Gum arabic 8 1/2 parts.
Sugar, loaf 2 1/2 "
Soap, white curd 1/4 "
Water glass ("A" sirup) 1 "
Egg albumen 4 "
Water, warm 20 "

In preparing this the first three ingredients are dissolved together in the water at boiling heat, the water glass is then added and when the mixture has cooled down to about 150° Fah., the egg albumen is put in and the whole well beaten together.

(3) G. P.—The following has been suggested as a very desirable substitute for the ordinary pastes used for mounting photo. prints. It is said that it can be used so as to scarcely swell the paper at all, avoiding the objectionable cockling so much complained of:

- Thick, well boiled, clear starch (corn) paste 1 pound.
Glucose sirup ("A" clear) 7 ounces.
White curd soap 1/2 ounce.
Dextrine, flowered 5 ounces.
Borax 1/2 "
Clove oil a few drops.

All are heated over the waterbath and thinned down to a proper consistence (if thin paste is required) with fresh skimmed milk. It is advisable to use the paste warm and as thick as possible.

(4) E. P. S. asks how to make matches without phosphorus? A. The following is one of the best receipts for composition match tips without phosphorus. It is the same as that used in preparing the well known U. and P. matches, and does not require a separate rubber or prepared surface:

- Potassium chlorate 36 ounces.
Manganese, black oxide 25 "
Potassium bichromate 20 "
Lead cyanide 20 "
Antimony oxysulphide 20 "
Glass powder 4 "

These substances are first powdered separately and then gradually mixed into a solution of 1 pound gum in 4 pounds water, to form a thick, smooth paste; with this paste the dry wood splints are tipped, and after about eighteen hours' exposure to the air in a drying room, kept at about 80° Fah., the matches are ready for boxing. To render the matches non-absorbent of moisture, or "waterproof," they are momentarily dipped into a liquid composed of:

- Shellac, best white 1 pound.
Alcohol (or wood naphtha) 1 quart.

digested together in a closed vessel for several days with occasional agitation, then strained through fine linen cloth.

(5) E. G. B.—Briefly stated, the process of rendering fabrics water resistant, yet not impervious to air, is as follows. First the cloth is put into a boiling bath composed of:

- Yellow soap 3/4 pound.
Water 1 gallon.

and worked through and about in this for about one hour, when it is passed through a roller wringer to press out excess of the liquid and suspended in the air for an hour or more, or until nearly dry. Next the cloth is put into a bath composed of:

- Ammonia alum 5 pounds.
Water 3 1/2 gals.

and remains therein for from eight to sixteen hours, according to the nature of the fabric and the requirements. The time of this exposure may be considerably lessened by working the cloth through a series of rolls, which cause the discharge of the absorbed liquid and admit of the reabsorption of fresh portions of the bath. Finally, after wringing out, the cloth is put through the soap bath again, and after rinsing in clean water, dried. See other similar processes of waterproofing in SCIENTIFIC AMERICAN, No. 6, vol. xiv., 1881.

(6) J. H.—Good pattern metal may be made of lead 8, antimony 2, but it shrinks in cooling. Lead 75, antimony 16, bismuth 8, does not shrink in casting. It also makes good patterns. Good red brass; 88 copper, 12 zinc. Electrotype manipulation is the deposition of metal by the galvanic batteries. Consult "Napier's Electro Metallurgy."