Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

The H. W. Johns Mfg. Co., 87 Maiden Lane, New York. manufacturers of asbestos packing and covering for all purposes, have recently made improvements in the manufacture of rod packing for steam, water, etc., by which its efficiency and durability is materially increased. These improvements consist in the arrangement of the fiber to give the packing a greater degree of elasticity, and at the same time to prevent its disintegration when in use.—*American Machinist.*

—— has just made his mark in the world, but the Esterbrook Pens are making their marks all the time. The reader is requested to mark this down.

Write J. Fitzgerald, publisher, 30 Lafayette Place, New York. for catalogue Humboldt Library of Science. Works by Tyndall, Huxley, Spencer, etc., 15 cents each.

The Best.—The Deuber Watch Case.

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

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

Drop Forgings of Iron or Steel. See adv., page 204.

Curtis Pressure Regulator and Steam Trap. See p. 206.

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

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

50,000 Emerson's Hand Book of Saws. New Edition. Free. Address Emerson, Smith & Co., Beaver Falls, Pa.

Eagle Anvils, 10 cents per pound. Fully warranted.

Gould & Eberhardt's Machinists' Tools. See adv., p. 206.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 204.

Barrel, Key, Hogshead, Stave Mach'y. See adv. p. 206.

Hand and Power Bolt Cutters, Screw Plates, Taps in great variety. The Pratt & Whitney Co., Hartford, Ct.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Hermance, Williamsport, Pa.

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

The Sweetland Chuck. See illus. adv., p. 206.

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

The Celebrated Wooton Desk. See adv., page 206.

The Ide Automatic Cut-off Engine, designed for driving electric lights and furnishing steady, reliable power; high speed; superior construction; economy in fuel guaranteed. A. L. Ide, Springfield, Ill.

Comfort Dinner Pails.—Most convenient in use. For sale everywhere. Reardon, Ennis & Co., Troy, N. Y.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 190.

Scientific Books. See page 188. 100 page Catalogue free. E. & F. N. Spon, 44 Murray 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.

Drop Forgings. Billings & Spencer Co. See adv., p. 173.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 174.

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 172.

See New American File Co.'s Advertisement, p. 174.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 172.

Steam Pumps. See adv. Smith, Vaile & Co., p. 172.

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 anodes, pure nickel salts, polishing compositions, etc. Complete outfit for plating, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

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

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.

Magic lanterns, stereopticons, cond. lenses, etc., on hand and made to order. G. Beseler, 218 Centre St., N. Y.

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

Improved Skinner Portable Engines. Erie, Pa.

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

For Power & Economy, Alcott's Turbine, Mt. Holly, 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), Baldwinsville, N. Y.

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

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

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.

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.

DES INGENIEURS TASCHENBUCH (The Engineer's Handbook). Edited by the "Hütte," in Berlin. Twelfth enlarged revised edition. 1,053 pp. Berlin: Ernst & Korn. 1883.

We have before us the twelfth edition of the "Engineer's Handbook," edited by the well-known Verein Hütte at Berlin. The work contains condensed information in mathematics, mechanics, machine building, motors, railroad engineering, technology, metallurgy, construction of buildings, physical, chemical, mathematical, and other tables, German building laws, and much other valuable information for civil and railroad engineers, builders, machinists, technologists, etc. The work is complete in every respect, is prepared with the greatest care, is very reliable, and is a model handbook. The additions of the new twelfth edition consist of new and valuable formulæ for mechanics, heat, the strength of materials, the statics of building constructions, parts of machines, motors, ship building, railroad engineering, technology, metallurgy, the German patent laws, and a number of new tables. The additions are too numerous to be mentioned singly. The work is provided with numerous illustrations.

REPORT OF AN EXAMINATION OF THE UPPER COLUMBIA RIVER AND THE GREAT PLAIN OF THE COLUMBIA, IN 1881. By Lieut. Thos. W. Symons, U.S.A. Washington: Government Print.

Lieutenant Symons' survey was undertaken to determine the navigability of the Upper Columbia and its adaptability to steamboat transportation. His report embodies a large amount of information with respect to the history, geography, and geology of this vast and little known region; its agricultural and commercial possibilities, and the engineering works needed to make the river and its tributaries navigable.

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) A. F. R. writes: I am working in a machine shop, and I find trouble in tempering their tools. They had a well bored last winter, and the water contains some kind of mineral; it is not good to drink. Please inform me in your paper whether the water might contain something to make the tools crack, and how can I prevent it. A. You may find whether the fault is in the water by tempering in good water brought from some other place. Steel that cracks should be hardened at a very low heat, a full red. Ascertain how low a heat you can harden with. You may have used a low grade steel and fallen into the habit of hardening with high heat. Try low heat and good water, and also low heat and the water from your well.

(2) The T., B. & W. Mfg. Co. write: We are making a good many brass globe valves, and we are unable to get the color on the bodies as we want them. There is one concern in this country that gets better color than anybody else, and we have tried very hard to get the desired color, but have failed. Now, we would like to ask you if you could give us a receipt by which we could obtain an orange color on the brass valve bodies? A. The orange color cannot be made upon yellow brass goods by dipping or any other process. You may make them of a fair yellow color by managing the time for taking from the moulds and dipping quickly in water and out, so that the remaining heat will dry them. The brilliant orange color can only be obtained in a tin alloy, and by timing the removal from the sand and dipping quickly in water. The following is one of the compositions that turn out a rich color:

Lake copper	1	pound.
Tin	1	ounce.
Zinc	½	"
Lead	½	"

Time, 7 to 20 minutes, according to thickness of castings.

(3) F. H. C. asks: 1. To what extent can hydrogen be heated without danger of its taking fire or exploding, if it is in an airtight bag where it has plenty of room to expand? A. Hydrogen can be heated to any extent without any danger of its exploding or taking fire, provided it does not come in contact with the air. 2. What temperature would rubber or gutta-percha stand without softening or melting? Please give the temperature for each. A. Both rubber and gutta-percha would soften at the temperature of boiling water. Vessels of either of these substances would be impracticable to use with hydrogen, except at ordinary temperature.

(4) S. M. writes: I wish to get some information about a zinc water paint. I have a receipt in which oxide of zinc, potato starch, aqueous solution of chloride of zinc, with tartrate of potash is used, but I have no formula for mixing it. A. Make a solution of starch, and also one of zinc chloride with potassium tartrate; combine these two and add sufficient zinc oxide to make the mass of such consistency that it may be handled with the brush.

(5) F. E. asks: 1. In the induction coil described in No. 160 of the SCIENTIFIC AMERICAN SUPPLEMENT, will paraffined paper in the condenser answer as well as the varnished? A. Yes. 2. How long a spark will the coil give by using a bichromate of potash cell of two plates, size 9 x 4 inches? A. About 1½ inches. 3. How many such cells are required to obtain the full effect of the coil? A. Two. 4. How much more electromotive force is produced in using two carbon plates instead of one in each cell? A. There is a slight increase.

(6) E. A. L. asks: Does air heat in proportion to its compression? Suppose 10 cubic feet of air at 70° Fahr. be compressed to 5 cubic feet, will the heat be raised to 140°? Must compression be sudden? A. Air at 70° compressed to one-half its volume will have a theoretical temperature of 170°. The compression must be sudden, and then an allowance must be made for a slight absorption of heat by the surrounding material. In practice you may get, by a continuous action in a pump, a temperature of 140°.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were Granted in the Week Ending

March 20, 1883,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 261 Broadway, corner of Warren Street, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications, not being printed, must be copied by hand.

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