

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 the following week's issue

Wanted—50 second-hand screw-cutting lathes, 8 to 12' swing, either foot or steam power. Will pay cash. W. P. Davis, Rochester, N. Y.

Acme engine, 1 to 5 H. P. See adv. next issue.

Wanted manufactured or will sell oil cup, page 218.

"U. S. metal polish. Indianapolis. Samples free.

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

6 Spindle Turret Drill Presses. A. D. Quint, Hartford, Ct.

Patent Open-Side Planing and Shaping Machines. Pedrick & Ayer, Philadelphia, Pa.

For first-class patterns write to Chas. Cassell, general patternmaker, Canton, Ohio.

For foundrymen's metallic pattern letters and figures send to H. W. Knight & Son, Seneca Falls, N. Y.

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

Screw machines, milling machines, and drill presses. The Garvin Mach. Co., Laight and Canal Sts., New York.

Centrifugal Pumps for paper and pulp mills. Irrigating and sand pumping plants. Irvin Van Wie, Syracuse, N. Y.

For Sale—Eleven hundred acres best coal land on Pacific coast. For samples, etc., address C. F. Pearson, box 148, Portland, Oregon.

For Sale—Patent No. 463,912, issued Nov. 24, 1891. Tools for miners' and blasters' use. Address R. A. McVitty, Portland, Oregon.

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

Convertible chair, cradle, and lounge. Patent for sale (No. 460,974), or wanted manufactured on royalty. Address F. A. Thomas, 149 Willoughby St., Brooklyn, N. Y.

For the original Bogardus Universal Eccentric Mill, Foot and Power Presses Drills, Shears, etc., address J. S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y.

Good Investment—Half interest in lamp wick raiser for flat wicks. Price, \$500. Patented Nov. 3, 1891. Particulars for stamp. M. A. McBride, M.D., Thomaston, Texas.

What do you want to buy? We will send without cost to you, catalogues, price lists, and information concerning anything you wish. Paret, Willey & Co., 265 Broadway, New York.

Competent persons who desire agencies for a new popular book of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

A middle aged married man, a traveled salesman of experience, now permanently located at Denver, Colo. (pop., 150,000), where he has extensive acquaintance, desires agency of some Eastern or foreign specialty. Address Brewster & Co., Mendota Block, Denver, Colo.

The Hall & Cook post hole digger (see advertisement, page 220), patented U. S. Jan. 26, 1892, has won a brilliant place among its users in Canada. Already the Canadian Pacific Railway has adopted it, and the Grand Trunk Railway took its adoption into favorable consideration just as frost set in. It is heartily indorsed by Hon. John Dryden, Minister of Agriculture for Ontario, besides a host of farmers, etc., who have thoroughly tested it. Judging from the favor it has already received with railway, telegraph and telephone companies, farmers, well and drain diggers, etc., it will be as indispensable as the spade has been in the past.

how to punctuate, capitalize, paragraph, read difficult manuscript, etc., with the facility and correctness usually acquired by the compositor in learning to set type. 2. Where is the Rogers typograph machine manufactured? A. Cleveland, Ohio. 3. Is it probable that a machine will be invented that will print short band characters as the ordinary type are printed by these machines? A. It would be as easy to print short band characters as Roman, but there is no call for a machine for such work.

(4210) V. D. R. writes: 1. I am a student of the high school of this place, and in one of our experiments in chemistry we were directed to take a piece of sodium and hastily plunge it under the mouth of a test tube inverted in water in a larger dish. In about nine cases out of ten an explosion takes place. Will you kindly inform me through Notes and Queries the reason of the explosion, which does not occur when potassium is substituted for the sodium. A. This is a phenomenon of the spheroidal state. The heat is at first so great as to prevent full contact of sodium and water. When the heat falls and contact occurs, the sudden heating produces an explosion. Potassium acts in the same way; neither should be used unless they are held under water. Both experiments are dangerous. 2. Also please give me equation for action in Leclanche cell. A. It may be written thus: Zn + 2NH4Cl = ZnCl2 + 2H + 2NH3, but is undoubtedly complicated by other reactions. 3. Is it necessary to wind secondary coil of an induction coil in opposite direction to that of primary? If so, why? A. No. 4. Is there any galvanic cell which has chloride of lime in porous cup with carbon and common salt in outer cup with zinc? If so, will you please give its E. M. F. in volts? A. You are thinking of Niander's battery. Plate of zinc in strong solution of common salt, porous cup containing plate of carbon and packed with chloride of lime and fragments of carbon. E. M. F. 1.65 running down to 1.5 volts. Resistance high, no action on open circuit.

(4211) F. L. W. asks: Can you tell me of a test that will indicate the presence of a very small percent of dissolved copper in water? Say one-tenth of a grain or less in a gallon of water. A. Excess of ammonium hydrate produces blue coloration in solution of copper. A very slight excess is enough. Possibly in your case it would be well to evaporate the water down in a porcelain dish or other vessel to about one-tenth its volume, acidify, filter and add ammonia water. Add enough to react on litmus paper or to give a perceptible odor of ammonia.

TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted March 22, 1892, AND EACH BEARING THAT DATE.

Table listing various inventions with their patent numbers, including items like 'Air, method of and apparatus for purifying and regulating the temperature of', 'Alarm, See Boiler feed alarm', 'Amalgamator for free-milling gold ore', etc.

Table listing various inventions with their patent numbers, including items like 'Car, bicycle passenger, day palace, and sleeping', 'Car brake, J. Taylor', 'Car coupling, J. B. Boltho', 'Car coupling, W. A. Salisbury', etc.

Table listing various inventions with their patent numbers, including items like 'Knitting machine, circular, E. A. Hirner', 'Knitting machine for knitting checkered fabrics, circular, J. Bradley', 'Knitting machine for knitting elastic fabrics, circular, J. Bradley', etc.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn. Special Written Information on matters of personal rather than general interest cannot be expected without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

Table with 2 columns: INDEX OF NOTES AND QUERIES, No. containing items like 'Battery, chlorine', 'Copper, to detect', 'Piping for heavy pressure', etc.

(4207) C. M. M. asks if there is anything that can be put in water so that by heating a piece of cast steel and plunging it into the water it will come out annealed. A. There is nothing needed in the water for "water annealing." The process is simply to heat the steel to a low red heat and allow it to cool slowly in hot ashes until it looks black or the red heat is entirely gone, then plunge in water.

(4208) H. M. B. says: Two miles from the city of Quito in Ecuador, and 1,600 feet above its elevation, there is a waterfall that would fill a pipe 12 inches in diameter. If that water was piped down to the city in the best iron or steel piping, what thickness of pipe would be required at the lower end to withstand the strain? A. Wrought iron pipe 12 inches is amply strong, if about 1/2 inch thick. The pressure is too great for a city water supply. Extra strong plumbing will stand a water head of 200 feet, at which height a reservoir should be placed and the water brought to it by a free run through ordinary pipe with an overflow waste. This is far better than any attempt to run a high pressure service.

(4209) C. H. asks: 1. Is it necessary for one desirous of learning any of the type-setting or type-casting machines to first learn the art of setting type by hand? A. It is not absolutely necessary, if one knows