

publishers to make the work more valuable year by year. Besides its very complete information about the stocks, bonds, floating debts, equipment, passenger and freight earnings, etc., of the various lines and their branches and consolidations, it also contains a full analysis of the debts of the United States, the several States, municipalities, etc., and statements of street railway and traction companies and industrial corporations.

**MECHANICAL DRAWING AND MACHINE DESIGN.** By J. G. A. Meyer. In 24 parts, fully illustrated. New York: Arnold Publishing House.

The seventh part of this valuable work has been issued. This part illustrates steam engine design, with the computations for proportions so fully treated that the work will become a standard reference for professional draughtsmen as well as students and amateur machinists. The price is 50 cents per number to subscribers.

**VOLCANOES OF NORTH AMERICA.** By Israel C. Russell, Professor of Geology, University of Michigan. New York: The Macmillan Company. Pp. 346. Price \$4.

Quite one-third of this volume, under the title of "characteristics of volcanoes," treats of the whole subject in a general way, a sketch map also showing the distribution of active and recently extinct volcanoes throughout the world. The most striking feature of this map is the great number of active volcanoes, represented as forming an almost continuous chain on our west coast, down through Mexico and the greater portion of the western coast of South America, while of extinct volcanoes there are several groups in California and Oregon, and farther up to Alaska. The many phases of volcanic phenomena occurring in the western portion of the United States are fully treated of, and the vast lava-covered region adjacent, but the author reminds us that the three volcanic cones of Shasta, Hood and Rainier, "if melted down and run together in one pile," would still fall much below the volume of Mauna Loa, on the island of Hawaii, the "monarch among modern volcanoes," and beside which Etna and all its adjuncts are vastly inferior. The book is well worth the careful perusal of students of geology and geography, but presents facts and comments of immense interest to every reader. It is handsomely printed and has many beautiful illustrations.

**SCIENCE READERS.** By Vincent T. Murchie. Adapted for use in schools by Mrs. L. L. W. Wilson, Ph.D., Philadelphia Normal School. Books I, II, III, IV. New York: The Macmillan Company. Pp. 127, 128, 176, 216. Price, I and II, 25 cents; III and IV, 40 cents.

This is an interesting series of books for young children, teaching in a conversational way the nature and properties of bodies; the nature, growth and structure of plants; the common types of animals; minerals and metals; the phenomena relating to the weather, etc. The several volumes and their successive lessons are graded to satisfy the growing intelligence of the child, and numerous of the most simple experiments and explanations are so plainly described and illustrated as to greatly attract and interest children, thus affording most valuable aids to parent and teacher.

**MECHANICS' AND ENGINEERS' POCKET BOOK.** By Charles H. Haswell. Sixty second edition. One-hundred and twenty-seventh thousand. New York: Harper & Brothers. Pp. 1037. Price \$4.

The successive enlargements and the great circulation which this manual has obtained, since the appearance of the first edition, in 1843, afford the highest of all testimonials as to its value. It had originally but 284 pages, and now the index alone requires 40 pages of fine type. Its tables, rules, and formulas pertaining to mechanics, mathematics, and physics; its information about hydraulics, hydrodynamics, steam and the steam engine, compressed air, gas and oil engines, masonry, limes, mortars, etc., have made it, for more than two generations, the best known handbook of its kind, the author constantly increasing its value, in the succeeding editions, by the insertion of additional facts, tables, etc.

**THE WHAT, HOW AND WHY OF CHURCH BUILDING.** By George W. Kramer. New York: Published by the author. Pp. 234.

The writer is an architect who has been connected with the building of a large number of churches and Sunday schools, and he presents in this book various plans of churches, chapels, etc., together with some fine half tone views.

We acknowledge the receipt from the Department of the Interior: Bulletins of the United States Geological Survey, No. 127 (1896), Catalogue and Index of Contributions to North American Geology, 1732-1891, Darton; 130 and 135 (1896), Bibliography and Index of North American Geology, Paleontology, Petrology and Mineralogy for 1892, 1893 and 1894, Weeks; 136 (1896), The Ancient Volcanic Rocks of South Mountain, Pennsylvania, Bascom; 137 (1896), The Geology of Fort Riley Military Reservation and Vicinity, Kansas, Hay; 138 (1896), Artesian Well Prospects in the Atlantic Coastal Plain Region, Darton; 139 (1896), Geology of the Castle Mountain Mining District, Montana, Weed and Pirsson; 140 (1896), Report of the Progress of the Division of Hydrography for the Calendar Year 1895, Newell; 141 (1896), The Eocene Deposits of the Middle Atlantic Slope in Delaware, Maryland and Virginia, Clark; 142 (1896), A Brief Contribution to the Geology and Paleontology of Northwest Louisiana, Vaughn; 143 (1896), Bibliography of Clays and the Ceramic Arts, Branner; 144 (1896), The Moraines of the Missouri Coteau and their Attendant Deposits, Todd; 145 (1896), The Potomac Formation in Virginia, Fontaine; 146 (1896), Bibliography and Index of North American Geology, Paleontology, Petrology and Mineralogy for 1895, Weeks; 147 (1896), Earthquakes in California in 1895, Perrine; 148 (1897), Analyses of Rocks and Analytical Methods United States Geological Survey, 1880-1896, Clarke and Hillebrand; 87 (1897), A Synopsis of American Fossil Brachiopoda, including Bibliography and Synonymy, Schuchert.

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.

Marine Iron Works. Chicago. Catalogue free. "U. S." Metal Polish. Indianapolis. Samples free. Yankee Notions. Waterbury Button Co., Waterbury, Ct. Handle & Spoke Mch. Ober Lathe Co., Chagrin Falls, O. Improved Bicycle Machinery of every description. The Garvin Machine Co., Spring and Varick Sts., N. Y. Concrete Houses - cheaper than brick, superior to stone. "Ransome," 757 Monadnock Block, Chicago.

We want handy things to make for bicycles on contract or royalty. Place & Terry, 247 Centre St., New York. The Norwich Line - New York to Worcester, Lowell, Gardner, Winchendon and Keene, N. H. From Pier 40, North River, 5:30 P. M., week days only.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

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. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. 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.

(7220) W. E. L. asks: Will you inform me how many 16 candle power 50 volt lamps the small alternating dynamo will light, and what amount of power it will require to run it? A. The alternating current dynamo referred to is designed for 110 volt lamps, and will light up 3 of 16 candle power or one of 50 candle power at this voltage. The machine should maintain two 50 volts 16 candle power lamps in series without difficulty, and require about 1/2 horse power to drive it.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

OCTOBER 5, 1897.

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing inventions with names and dates. Includes: Acid, manufacturing nitric, J. V. Skoglund; Advertising or display rack, transformable, E. Jutz; Air or steam compressor, S. S. Miles; Alarm, See Burglar alarm, Fire alarm; Amalgamator, J. P. Schmitz; Annunciator, F. P. Stevens; Antirattler, shaft support, and safety strap, combined, S. A. Bailey; Apron fastener, rain, A. F. Brandenburg; Auger, packing, J. Koelner; Axle and axle box, M. D. Mack; Bale band tightener, J. L. Duval; Bank, savings, A. R. Clarke; Barrel machine, R. Nawrath; Battery, See High tension battery; Bearing, roller, J. B. Baker; Beating out machine, G. B. Gates; Bed crib attachment, H. I. Holderness; Bell chiming apparatus, electric, N. McMenamin; Belt stretcher, Kern & Lynch; Bib, H. P. Lehnart; Bicycle, C. Eickemeyer; Bicycle, W. Quinn; Bicycle fork truing and straightening gage, R. Johnston; Bicycle frame, T. Tolson; Bicycle holder, C. E. & M. R. Jewell; Bicycle lock, B. H. Walker; Bicycle mud guard, H. L. Hall; Bicycle rear forks, yoke for, H. McDonald; Bicycle saddle, B. S. Seaman; Bicycle seat or saddle, A. J. Downer; Billiard and pool table leveler, G. W. Nicholson; Bin, See Flour bin; Binder, paper, A. W. Rasmussen; Blowing engine, E. Reynolds; Boiler connection, hot water, G. W. Graves; Boiler for steam or hot water heating, W. M. Mackay; Book collating machine, T. C. D. xter; Boot or shoe shanks, etc., machine for making leather board, J. Hyslop; Bottle, L. Burnett; Bottle, R. S. Dickerson; Bottle, non-refillable, Banta & Marble; Bottle, non-refillable, E. Junker; Bottle stopper, S. Crocker; Box, See Dice box, Junction box, Miter box, Paper box; Box, S. T. Russell; Boxes, apparatus for scoring, cutting, and printing cardboard, D. S. Clark; Braiding machine, electromagnetic, A. C. Shuttleworth; Brake, See Pneumatic and electric controlled brake, Safety brake; Bran packer, J. Koelner; Brickkiln, H. R. Vaughan; Burglar alarm, L. M. Pratt; Burner, See Gas burner; Buttonhole stitching machine, J. Q. A. Hough-ton; Calculator, mechanical, R. Dunlop; Calendar, perpetual, F. S. Hodgdon.

Advertisements.

ORDINARY RATES.

Inside Page, each insertion, - 75 cents a line. Back Page, each insertion, - \$1.00 a line. For some classes of Advertisements, Special and Higher rates are required.

The above are charges per agate line - about eight words per line. This notice shows the width of the line, and is set in agate type. Engravings may be advertised at the same rate per agate line, by measurement, as the letter press. Advertisements must be received at Publication Office as early as Thursday morning to appear in the following week's issue.

Star Screw... cutting Lathes Automatic Cross feed 9 and 11-inch Swing. New and Original Features. Send for Catalogue B. Seneca Falls Mfg. Company, 695 Water St., Seneca Falls, N.Y.

ROTARY PUMPS AND ENGINES: Their Origin and Development. - An important series of papers giving a historical resume of the rotary pump and engine from 1588 and illustrated with clear drawings showing the construction of various forms of pumps and engines. 38 illustrations. Contained in SUPPLEMENTS 1109, 1110, 1111. Price 10 cents each. For sale by Munn & Co. and all newsdealers.

POWER & FOOT LATHES. SHAPERS PLANERS DRILLS. MACHINES & HOPE CUTTERS TOOLS AND SUPPLIES. CATALOGUE FREE. SEBASTIAN LATHE CO. 120 CULBERT ST. CINCINNATI, O.

HAVE THE LATEST IMPROVEMENTS.

No machine shop can be thoroughly up-to-date unless it has the most modern perfected tools. For instance, the

ASHLEY PATENT NIPPLE HOLDERS hold nipples for cutting either right or left hand threads. They hold the sleeve from turning and take the strain off both the sleeve and shank thread. Made of best quality cast steel, carefully fitted. Long or short nipples cut with equal facility. The Ashley Holders are of light weight and compact form. WALWORTH MFG. CO., 20 Oliver St., Boston, Mass.

SAVE 1/2 YOUR FUEL. By using our (stove pipe) RADIATOR. With its 120 Cross Tubes, ONE stove or furnace does the work of TWO. Drop postal for proofs from prominent men. TO INTRODUCE OUR RADIATOR, the first order from each neighborhood filled at WHOLESALE price, and secured an agency. Write at once. ROCHESTER RADIATOR COMPANY, 82 Furnace St., ROCHESTER, N. Y.

DOUBLE STEEL SQUARE. 2 1/2 inch for toolmakers. As shown, \$2.00. With either bevel or narrow blade, 2.30. Complete, 2.60. 98 page catalogue of Fine Tools, free. The L. S. STARRETT CO. Box 13, ATHOL, MASS., U. S. A.

Tools For All Trades

You can't even think of a Tool that isn't mentioned in our 1897 Tool Catalogue. Every Metal Worker, every person interested in Machinery or Machinery supplies, needs it in his business. It contains 700 pages, 6 1/2 x 7 1/2 inches, and is a complete Tool Encyclopedia. Handsomely bound in cloth, express paid on receipt of \$1.00. Money paid for book will be refunded with first order amounting to \$10.00 or over. MONTGOMERY & CO. MAKERS and JOBBERS IN FINE TOOLS, 105 Fulton Street, New York City.

Patent Carrying Track OVERHEAD TRAMWAY for Mills, Foundries, Machine Shops, or for Merchandise. Send for Book. The Coburn Trolley Track Mfg. Co., HOLYOKE, MASS.

LATHES FOR GUNSMITHS, TOOL MAKERS, EXPERIMENTAL AND REPAIR WORK, ETC. Send for Illus. Catalog. W. F. & Jno. Barnes Co. 1899 Ruby Street, ROCKFORD, ILL.

ROCK DRILLS AIR COMPRESSORS SIMPLEST, MOST EFFICIENT and DURABLE. RAND DRILL CO. Send for Catalogue. 100 Broadway, New York.

Queen's Patent "Triple Plate" Toepler-Holtz Electrical Machine. Can be used at all times of year and in all kinds of weather. Prices range from \$25 to \$50. Circular on application. We carry a complete line of Electrical and Physical Instruments and Apparatus. QUEEN & CO., Inc. 1011 Chestnut St. Philadelphia, Pa.

Table listing various mechanical and electrical items with prices. Includes: Calipers, C. P. Fay; Can, See Sheet metal can; Can or jar holder, adjustable, E. Brown; Cap, expandible, Watson & Luycck; Car coupling, J. Jarrett et al.; Car fender, A. H. Geitz; Car frame, W. E. Coffin; Car switch operating mechanism, J. Lamontagne; Carpet stretcher, T. B. Chubb; Carriage, folding baby, C. D. Chandler; Case, See Pencil scribbling case; Cash register, C. McNabb; Chain bucket elevator, C. Schlick eyesen; Chair fan attachment, rocking, F. H. Masterson; Chopper, See Cotton chopper; Meat chopper; Chuck, tool, I. Barker; Churn and butter worker, combined, H. J. Anderson; Churn propeller, J. P. Bolding; Chute, coal, G. W. Turner; Chute, wagon, W. Rodenhansen; Cigar bunch making machine, S. A. Shepard; Cigar tip cutter, T. H. Ross; Cigarette pressing and cutting machine, E. Georgiu; Circuit, automatic test, L. G. Howard; Claw bar, J. Lindgren; Clay, etc., apparatus for moulding, H. Sturm; Cleaner, See Window cleaner; Clock, electric, C. Gullberg; Clothes line, H. C. Eakin; Clothes line holder, portable, E. Noil; Clothes wringer, Fortney & Stevens; Clothes wringer, Reeves & Lentz; Clutch, W. H. Lafaele; Coal beds, method of and apparatus for stripping; Mason & Hoover; Coal or rock drill, G. H. Bittenbender; Cook for toilet basins or bath tubs, water, W. F. Washburn; Coffee roasting apparatus, B. Tupholme; Commutator for dynamo electric machines, J. J. Wood; Concentrator, H. L. Eiton; Condenser or similar apparatus, self cooling, L. R. Alberger; Conveyor chute valve, C. Piez; Cotton chopper and cultivator, B. L. Hargrove; Cotton press, F. L. Dyer; Cotton press, M. Swenson; Coupling, See Car coupling; Hose coupling; Hydrant coupling; Indmill coupling; Crate, folding, M. Ek; Crate, folding, L. Palmer; Cultivator, G. McDougall; Cup, See Oil cup; Curling iron, Sear, S. D. Murphy; Curling iron heating support, E. Bowman; Curling iron holder, A. K. McKone; Currycomb, L. O. Day; Currycomb and brush, combined, M. V. Griffey; Current generator, alternating, C. S. Bradley; Current motor, alternating, C. S. Bradley; Curtain, See Drapery & Motor; Cutter, See Cigar tip cutter; Grooving cutter; Cutter head, R. Harris; Cutter head, rosette, R. Harris; Cylinder lock, W. F. Troast; Damper mechanism, time, W. F. Kellogg; Dental chair, F. Torney; Dice box, O. E. Dubois; Dish attachment, carving, S. Sherman; Disinfecting and deodorizing purposes, apparatus for, A. G. Hunter; Dressing apparatus, J. Gallegos; Durdanizer, W. H. B. Louden; Draught regulator, automatic, C. E. Alden; Drawer equalizer, furniture, C. E. Howard; Drill, See Coal or rock drill; Pneumatic drill; Drinking fountain for poultry, etc., F. A. Williams; Dye, recd, J. V. Hill; Egg, medicated nest, N. S. Clark; Electric currents, method of and apparatus for multiple rate metering for, E. Oxley; Electric generator, magneto, J. A. Williams; Electric machine, dynamo, M. E. Thompson; Electric machine, indirect regulation of dynamo, G. S. Dunn; Electric motor, alternating current, O. B. Shallenberger; Electric motor, alternating current, W. Stanley; Elevator, See W. A. Drew; Electric wiring, outlet box for, W. Soons; Electrical exchange, A. B. Strewgar et al.; Elevator, See Chain bucket elevator; Water elevator; Elevator lock, M. J. Daly; Elevator safety device, R. O. Grand; Engine, See Blowing engine; Road engine; Rotary engine; Rotary steam engine; Engine igniting means, explosive, V. G. Apple; Engineer's or surveyor's instrument, C. L. Berger; Excavator, F. O. Kilgore; Eyeglasses, G. Bausch; Eye protector, E. R. Wylie; Fabrics, joining edges of previously waxed, W. H. Simonson; Fan, H. B. Collins; Faucet, E. Bourne; Feed water heater and purifier, C. B. Rogers; Fence, portable, J. R. Morris; Fence wire, R. T. Van Valkenburg; Fence wire tightener, F. M. Osure; Fence, woven wire, Purdy & Carson; Fender, See Car fender; Fire fender; Filter, J. Davis; Filter, M. E. Jones; Filter, water, S. C. Parsons; Filtering surfaces, method of and means for cleaning, J. Mohring; Fire alarm, automatic, Robinson & Smith; Firearm lock mechanism, H. Pieper; Fire extinguisher, automatic, F. J. Gschwind; Fire fender, H. Wilson; Fish line reel, W. Shakespeare, Jr.; Flour bin and spice receptacle, M. F. Brown; Flour dressing machine, G. T. Smith; Flushing device, W. Scott; Forging machine, metal, F. G. Myers; Fountain, See Dri king fountain; Ink fountain; Fruit gatherer, I. C. Drake; Fruit or wine press, J. E. Guenther; Furniture, framing for articles of, J. C. Horn; Gage, H. R. Brown; Galvanizing machine, E. B. Cook; Gas burner, J. A. Kloebe; Gas burner, incandescent, M. Eisner; Gas lighting apparatus, electric, A. L. Bogart; Gas main stopper, F. Goodman; Gate, R. H. Berkness; Gate, J. L. Bicke staff; Generator, See Current generator; Magneto electric generator; Glove fastening device, W. B. Page; Glycerine from spent soap lye, process of and apparatus for recovering, H. J. E. Hennebutte; Governor, engine, Konley & Macomber; Governor for steam engines, dynamometric, A. L. F. Bayle; Grain binder, L. Miller; Grain separator, A. M. McCune; Grain separator, centrifugal, F. F. Landis (re-issue); Grinding or other machines, micrometer feed for, C. H. Norton; Grooving cutter, Thackeray & Ferguson; Gun, recoil operat, G. A. Farrall; Gun safety device, bolt, L. L. Hepburn; Hanger, See Door hanger; Picture hanger; Pipe hanger; Harness, J. Mealey; Harness back band, G. M. Kirwin; Harvesting grain, G. A. Farrall; Heat detector, H. Ruetschli; Heater, See Curling iron heater; Feed water heater; Heater, J. A. Breen; Heel nailing machine, H. W. Winter; High tension battery, R. Ashley; Hinge, spring, L. R. Pomeroy; Hollow ware, machine for making, J. A. Densmore; Hook, See Trace hook; Horseshoe, J. D. Hall; Horseshoe, cutligned, J. B. Gravis; Horseshoe, nailless, E. D. Shaifer; Horseshoe, rubber tread, J. Korbien; Hose coupling, A. W. Billman; Hose coupling, S. W. Lucas; Hydrant coupling, J. Naud, Fils; Indicator, See Speed and direction indicator; Indicator for carriages, etc., J. A. Kunkel; Inhaler, B. McGregor; Ink fountain, marking, F. E. Frost; Insulator, electric wire, W. Roberts; Invalids, adjustable support for, W. Harbaugh; Iron, See Bed iron; Ironing board, G. A. Horn; Jack, See Lifting jack.

(Continued on page 254)