

The Holly Manufacturing Co., of Lockport, N. Y., will send their pamphlet, describing water works machinery, and containing reports of tests, on application.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 and 421 East 8th Street, New York.

Cushman's Chucks can be found in stock in all large cities. Send for catalogue. Cushman Chuck Co., Hartford, Conn.

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

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N.Y. See illus. adv., p. 23.

Graphite Lubricating Co., Jersey City, N. J. Graphite bushings and bearings, requiring no grease or oil.

Quints' patent automatic steam engine governor. Correspondence solicited from manufacturers of throttle governor engines. Leonard & McCoy, 118 Liberty Street, New York.

Catarrh Cured.

A clergyman, after years of suffering from that loathsome disease, catarrh, and vainly trying every known remedy, at last found a prescription which completely cured and saved him from death. Any sufferer from this dreadful disease sending a self-addressed stamped envelope to Prof. J. A. Lawrence, 212 East 9th St., New York, will receive the recipe free of charge.

Talcott's Wilson and combination belt hooks. Providence, R. I.

Lathes for cutting irregular forms a specialty. See ad. p. 349.

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Hodges' universal angle union makes pipe connection at any angle. Rollstone Machine Co., Fitchburg, Mass.

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

NEW BOOKS AND PUBLICATIONS.

LIFE OF WASHINGTON. By Virginia F. Townsend. Published by Worthington & Co., N. Y. Illustrated. 12mo. Cloth, \$1.25.

As a perusal of this work will show, this is a woman's way of looking at the great national hero; and although the ground traversed has been trodden before, it possesses interest from its actual familiarity, and tells a story of which one never tires. The work contains a series of pictures which take hold of the fancy and give a pretty vivid picture of the great man and his surroundings. The type is bright and clear and the illustrations well selected, rendering the work an appropriate one to be put in the hands of the young, for whom it was principally written.

EASY LESSONS IN THE DIFFERENTIAL CALCULUS. By Richard A. Proctor. London: Longmans & Green. 1887. Pp. vi, 114.

This little work is reprinted from the columns of Knowledge, the well known scientific journal, which is edited by Mr. Proctor, who also contributes a great part of the matter that appears in its columns. The book purports to give a thoroughly practical view of the subject. The work, small as it is, contains, according to the author's statement in the preface, rather more of the differential calculus than he was obliged to take up in studying for a degree at Oxford University. The general idea is to give the more practically useful applications of the science, such as determination of maxima and minima, quadrature of areas, and the like. The work is of pocket size, and in giving a more popular cast to the subject should be serviceable in removing some of the dread which people are apt to entertain for calculus.

FIRST STEPS IN GEOMETRY. By Richard A. Proctor. London and New York: Longmans, Green & Co. 1887. Pp. viii, 179.

This work attacks the solution of geometrical problems, such as questions in maxima and minima, rather than the study of propositions. It is not very extensive, as is evident from the limited number of its pages, but it, like the calculus of the same author, forms a pleasing pocket manual and complement to the ordinary course in geometry. For those who find their mathematics growing rusty, this work may be recommended as adapted to refresh the mathematical knowledge so often laboriously acquired and quickly forgotten.

A SHORT HISTORY OF ARCHITECTURE. By Arthur Lyman Tuckerman. With illustrations by the author. Charles Scribner's Sons.

As its title indicates, this is an elementary work giving in a clear, incisive, interesting way, a brief account of the origin and growth of the various styles of architecture. As it passes over the entire province of architecture, it gives the reader little more than a glance at the various topics touched upon, but the glance is comprehensive and instructive, and although we do not, of course, look for anything absolutely new, we have facts put before us in such a way as to leave an impression that will render these facts available for reference and future use. The author has endeavored to bring out the distinctive features of the various types and to emphasize their more prominent characteristics. Pages 168, price \$1.50.

A MANUAL OF ANALYTICAL CHEMISTRY, QUALITATIVE AND QUANTITATIVE, INORGANIC AND ORGANIC. By John Muter, M.A., Ph.D., etc. Philadelphia: P. Blakiston, Son & Co. 1887.

This work is calculated for the English Technical School requirements. It is largely in the form of schemes of analysis, not being a treatise on the subject in the sense of Fresenius' or Rose's works. It is a very useful laboratory companion, though for purposes of instruction, where the student is to be made a chemist and not a mere analyst, it should be supplemented by a more extensive work. In books of this class the danger is that a student may acquire the idea that every precipitate is absolutely insoluble, and that every analysis must go by the scheme like clockwork. Chemistry in its full scope is better studied by the defects of analytical processes than by their too successful application to simple analyses.

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.

(1) F. H.—Marble is finished by grinding the surface with fine sand under a slab of stone, which may be a piece of marble or sandstone, to a true surface. Then the surface is smoothed with ground pumice stone under a rubber of leather or felt, and afterward polished with oxide of tin and water with a rubber of felt. The rubber is fastened to a block of wood.

(2) F. S. A.—No satellites or planets move in circles, to our knowledge. There is a possibility of comets moving in parabolas or hyperbolas; but the probability is that all orbits to which our sun is a common center are elliptic. The influence of the planets upon comets may often be such as to change their orbits apparently to hyperbolas, as also to change the direction of the axis of their future orbits. We have yet to find that any cometic orbits are interstellar.

(3) J. B. C.—Lead does not run smooth in casting with any kind of mould, nor do we know of any elastic substance that will not be destroyed by the heat of melted lead. If you can alloy the lead with tin or with tin and bismuth, it will run smooth at much lower temperature than the melting point of lead. Old typemake a smooth-running metal, which can be cast in plaster of Paris moulds.

(4) W. C. D. asks how solar prints are made. A. Specially prepared silvered paper is placed in a large extension camera, upon which the enlarged image is received. After an exposure of 15 minutes to sunlight, the paper is removed in a holder and to a dark room, where the picture is developed by means of special preparations. This slow method is now largely superseded by the employment of bromide paper, which is much more rapid and can be used with artificial light. In a dark room the paper may be pinned to a wall, and the enlarged image of a negative in an apparatus like a magic lantern be thrown upon it for about two or three minutes. It is then removed and developed in a solution of iron and oxalate of potash called ferrous oxalate, fixed in hyposulphite soda solution, washed, and dried. In all cases it is essential that a glass negative, somewhat thin, be secured from the paper photograph. Better still, use the original negative when possible.

(5) W. O. says: Will you kindly oblige one who, although a helpless invalid for fifteen years, is still much interested in your paper, by giving him the best information at your disposal? 1. What is the composition and process of manufacture of the best artificial stone sidewalk you know of? A. To make a cement walk, level the ground and pack the earth well; then spread upon it a stiff mortar three inches thick, of sharp sand four parts, best cement one part. Cover this while fresh with another coating of mortar made of best Portland cement one part, clean, sharp sand 2 parts. 2. Is there a reliable artificial building stone? If so, what is it composed of? A. Good artificial stone is made of best Portland cement one part, clean, sharp sand two parts, mixed stiff, shaped in boxes to give the desired form of blocks.

(6) J. J. C. asks the best coating or covering to prevent water pipes from freezing. A. Heavy hair felt and mineral wool covering, boxed, or boxing and filling with sawdust, hay, or straw, are all suitable for preventing freezing. The size of the box should be made suitable to the intensity of exposure; 1/2 inch or 3/4 inch water pipe should have from 3 to 5 inches of space all around filled with packing where exposed to cold winds.

(7) J. T. D. writes: When lead is plated with copper and used to make a steam joint, will the copper protect the lead from the steam? A. Lead does not make a good steam joint under any condition; it is too plastic. The copper cover will protect the lead from the action of the steam, and in this combination may make a joint that will answer for some purposes, but not as good as a corrugated pure copper gasket.

(8) T. N. C. asks why the Christian era commences four years after the birth of Christ. A. Our present era was fixed by Dionysius Exiguus in 525 A.D., and the latest edition of the Encyclopedia Britannica is authority for the statement that "we cannot demonstrate the exact year of the nativity, but critics of all schools are verging more and more to the acceptance of 4 B.C. as the probable year of Christ's birth."

(9) W. N. asks how to dress the skins of birds so that they can be pieced together and made into a small robe or mat. A. Thoroughly impregnate the fibrous part with a mixture composed of 4 parts alum and 1 part alum and saltpeter. Arsenic powder is also sometimes used in similar work as a protection from insects and vermin, but the danger of employing such a poison is evident. For directions about skinning and stuffing birds, see Spens' Workshop Receipts, first series, which we mail for \$2.00.

(10) E. H.—The first French steam railway was the Paris and St. Germain line, 11 miles long, opened in 1827.

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

November 15, 1887,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions and their patent numbers, including items like Air compressors, Alarm, Alloy, Bag holder, Bailer, Baking tin, Baling press, Battery, Bed cover holder, Bed, Bedstead, Bell, Bell, electric, Bell, signal, Belt, Blind stop, Blind window, Board, Boat detaching mechanism, Boiler, Boiler flue attachment, Bolt, Boot, Bottle stopper, Bottle washing machine, Box, Bran duster, Brick machine, Bridge gate, Bridle check piece, Brush, Buckle, Bung making machine, Burner, Bustle, Bustle, M. B. Hammond, Button, Buttonhole piece, Button or stud, Button, spring cuff, Button tuft or ornament, Buttons, etc., Cable grip, Calendar, Can cover clamp, Can opener, Cane, Canning machine, Canvas stretcher, Car coupling, Car coupling, P. Campbell, Car coupling, J. Timms, Car coupling, T. Welch, Car heater, Car heating apparatus, Car mover, Car, railway, Car signal, Car starter, Car wheel, Car wheel rims, Card list, Carding machine, Carriage top irons, Carriage top irons, machine for filling, Carriage top irons, machine for sawing, Carriages, gear iron for, Carrier, Cash and parcel carrier, Casting ingots, Chair, Check register, Churn, Cigarette machine, Clamp, Clock, Clock synchronizing apparatus, Closet, Cloth finishing machine, Coke in ovens, Combing fibrous substances, Compressor cross head, Convertible chair, Conveyer, Cooler, Cord or twine, machine for making, Cot, Cotton compressor, Cotton, etc., machine for opening and cleaning, Coupling, Coupling, Traver & Weeks, Coupling for hose, steam pipe, etc., Cuff fastener, Culinary boiler, Cultivator, Cultivator, duster, and digger, Cutter, Decorticating machine, Dental engine, Dental engine, W. B. Mann, Double-acting bolt, Door hanger, Door lock, Door spring, Drain pipe, Dress form, Dress shield and making the same, Drill, Dust collector, Earthenware, manufacturing, Electric cable, Electric machine and electro-motor, dynamo, Electric machines, automatic regulator for dynamo, Electro motor, Electro motor, E. Thomson, Electric wires in underground conduits, sectional draw rod for placing, Electro motor and dynamo electric machine, Electrode for forming clots in varicose veins, Elevator, Elevator, H. F. Wallmann, Engine, Extension table, Extension table, T. Skinner, Eyeglasses, Farm gate, Feed water apparatus, Feed water purifier, Feed water purifier, S. H. Mosher, Fence, Jay & Coate, Fence lock and stretcher, wire, Fence rail, A. M. Brock, Fence wire spooling device, Fifth wheel blocks, making, File, paper, W. H. H. Claugue, Filter, Filter for cisterns, M. Rice, Firearm, magazine, C. J. Ehbets, Firearm, magazine, W. Mason, Fire kindler, Clough & Flynn, Fish trap, Flour mill, roller, N. Cornelius, Frame, Furniture base or support, Gaiter, Galvanic battery, C. Gassner, Jr., Game, ball, A. M. Freeman, Gas main, Gas, process of and apparatus for manufacturing, Gas supply, pressure gauge attachment for automatically controlling, Gate, Glass by means of compressed air, apparatus for blowing, Glass globes, manufacturing, Glove or mitten, Grain binders, cord tyer for, Grain cleaning and separating mill, Grain drying apparatus, Grapple adjuster, Grinding and polishing material, Grinding or pulverizing mill, Grindstone frame, Guard, Gun or firearm, repeating, Handle, Harrow and seeder, combined, Harrow, disk, Harvester, self-raking attachment for, Harvesters, twine holder alarm for, Hat bodies, machine for manufacturing, Head rest, Heater, Heater, D. F. McHenry, Heel nailing machine, Hides, machine for unhairing, Hinge, Hoisting and conveying machine, Hoistways, door for, Holder, Hoop expander, Hook, C. Robin, Hopple, Horseshoe attachment device, Horseshoe machine, Hydraulic engine, Indicator, Injector for furnaces, air, Insecticide, Ironing tablet, Jack, Jar, Jar cover fastening, Joint, Journal box, self-oiling, Key, Lacing hooks, machine for setting, Lamp, Lamp burner, H. Gillette, Lamp burner, E. B. Requa, Lamp, gas, R. M. Dixon, Lamp, hanging, E. Fisher, Lamp, trimmer, J. L. Morris, Lamp shade, G. E. Brehmer, Lamp, signal, R. J. Armour, Lamp standard, W. Patzer, Lamp, standard, W. A. Penfield, Lantern, tubular, F. Dietz, Latch, gate, G. W. Charleville, Leather, machine for splitting scraps of, Light, Lightning rods, interlocking coupling for, Lithographic process, etc., Lock, Lock, door, Lock, door, Fence lock, Trunk lock, Lock, W. H. Taylor, Loom for weaving looped or terry fabrics, Loom, hand, C. N. Newcomb, Looms, harness board for Jacquard, Looms, positive shuttle motion for, Magnetic separator, Mail bag fastener, Mail bag fastener, G. L. Walton, Mail box indicator, Mail box indicator, J. P. Tirrell, Dental engine, W. B. Mann, Double-acting bolt, H. Clemons, Door hanger, H. Fleming, Door lock, E. Yeiser, Door spring, W. Gillilan, Drain pipe, T. W. Larrabee, Dress form, J. D. Richardson, Dress shield and making the same, G. A. Close, Drill, See Rail drill, Dust collector, O. M. Morse, Earthenware, manufacturing, M. S. Higbie, Electric cable, A. E. Dolbear, Electric machine and electro-motor, dynamo, W. Main, Electric machines, automatic regulator for dynamo, C. D. Jenney, Electro motor, E. Thomson, Electric wires in underground conduits, sectional draw rod for placing, W. H. Hart, Electro motor and dynamo electric machine, W. Main, Electrode for forming clots in varicose veins, J. R. Hamilton, Elevator, V. Gelineau, Elevator, H. F. Wallmann, Engine, See Dental engine, Hydraulic engine, Steam engine, Vibrating engine, Extension table, G. Hebebrand, Extension table, T. Skinner, Eyeglasses, C. H. Farley, Farm gate, O. A. 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Mann, Gate, See Bridge gate, Farm gate, Glass by means of compressed air, apparatus for blowing, R. E. Donovan et al., Glass globes, manufacturing, R. G. A. Witt, Glove or mitten, R. D. Burr, Grain binders, cord tyer for, W. Butterfield, Grain cleaning and separating mill, M. Grollmund, Grain drying apparatus, P. Jepson, Grapple adjuster, E. A. Reed, Grinding and polishing material, C. M. Lindsey, Grinding or pulverizing mill, A. Morlock, Grindstone frame, W. Thornburgh, Guard, See Railway cattle guard, Gun or firearm, repeating, J. W. Mullins, Handle, J. E. Gaitley, Hanger, See Door hanger, Shaft hanger, Shafting hanger, Harrow and seeder, combined, C. Svendsen, Harrow, disk, M. G. Elliott, Harvester, self-raking attachment for, M. Dew, Harvesters, twine holder alarm for, J. Davaine, Hat bodies, machine for manufacturing, T. Shirley, Head rest, M. J. Koenig, Heater, See Car heater, Heater, D. F. McHenry, Heel nailing machine, J. F. McMullett, Hides, machine for unhairing, J. W. Vaughn, Hinge, P. Forg, Hoisting and conveying machine, W. Thornburgh, Hoistways, door for, W. K. Crofford, Holder, See Bag holder, Bed cover holder, Paper holder, Photographer's plate holder, Surgical instrument holder, Shade holder, Hoop expander, C. H. Shepard, Hook, C. Robin, Hopple, J. A. W. Burris, Horseshoe attachment device, J. Ott, Horseshoe machine, J. A. Burden, Hydraulic engine, C. R. Whittier, Indicator, See Mail box indicator, Weather warning indicator, Injector for furnaces, air, W. S. Hutchinson, Insecticide, A. Fullwiler, Ironing tablet, C. Zimmerling, Jack, See Wagon jack, Jar, See Battery jar, Jar cover fastening, F. H. Palmer, Joint, See Railway rail joint, Journal box, self-oiling, M. Garland, Key, See Telegraph key, Lacing hooks, machine for setting, J. H. Reed, Lamp, B. J. M. Menge, Lamp burner, H. Gillette, Lamp burner, E. B. Requa, Lamp, gas, R. M. Dixon, Lamp, hanging, E. Fisher, Lamp, trimmer, J. L. Morris, Lamp shade, G. E. Brehmer, Lamp, signal, R. J. 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