

portion percolates through various layers of filtering material and strainers, reaching the bottom thoroughly cleansed of all impurities.

HOT WATER HEATER.—Micheal E. Herbert, St. Joseph, Mo. In this heater, all the walls of the fire box constitute a water space, the grate also consisting of water tubes, and a series of drop tubes being arranged in the path of the discharge of the products of combustion, affording a great amount of surface for the absorption of heat.

LAMP CHIMNEY COVER PLATE.—James H. Hunt, Massillon, Ohio. This is a plate of non-combustible material, preferably mica, with a central aperture of less diameter than the lamp chimney, and fitting over its top, another plate sliding in guides being adapted to increase or diminish the draught.

CHIMNEY RACK.—Nehemiah H. Brown, Norwich, N. Y. This is a show rack for supporting the chimneys so they will be well displayed to view and readily accessible. It consists of a rotating cone having pins set at an angle in its side, a base and shaft supporting the cone.

RACK FOR HATS, ETC.—Howard U. Ackerman, North Indianapolis, Ind. This device has a wall board with enlarged openings for the passage of pins and their lugs, and the rack comprises a series of brackets each formed with hooks and connected by rods to each other to form a shelf.

SASH-CORD FASTENER.—Margaret J. Huffman, Ashland, Pa. This device consists of a box or casing to be secured in the upper ends of the stiles of each window sash, the box having an open outer side, a slot in its outer edge at the top, and pins, a hinged cover, and a double latch. When it is desired to remove the sash from the window, it is pulled out of its guideways, the lid of the box is swung, and the cord readily removed from the casing, so that the sash is disconnected, and can be moved away as may be desired.

CASH RECORDER AND DRAWER.—Lloyd M. Mills, Grand Rapids, Mich. This is a machine arranged to print on a tape a record of all sales made, and also print on a tape a detachable ticket indicating the individual sale. The device has a suitable casing in the bottom of which slides a money drawer, the locking bolt of which is connected with a lever. By the use of ten keys the operator can record any sale from one cent to a hundred dollars, the recording tape remaining inside the locked casing, and a corresponding coupon for each sale being cut off by a spring-pressed knife.

BOOK OR COPY HOLDER.—Barney Gardiner, Chippewa Falls, Wis. This is a simple device to support copy or a book at a distance above a table, in such position as may be desired. The device is capable of quick and convenient manipulation, and when not in use may be folded to occupy but a small space.

AUTOMATIC ADVERTISING DEVICE.—Theodore B. Hafertep, Chicago, Ill. An exhibitor for use in public conveyances is provided by this invention. It consists of an endless band supported to move longitudinally on a bracket frame projecting from the side or roof inside the vehicle, the band carrying advertisements in series, and motion being communicated to it from the car axle, so that when the car is moved in either direction all the advertisements on the band will be brought into view.

DISINFECTING APPARATUS.—Emil and Salomon Tausig, New York City. The graduated discharge of a disinfecting fluid in places needing such treatment is the object of this invention. The device is simple and inexpensive, and can be automatically actuated to allow the escape of the fluid, which is retained from discharge by hermetically sealing the containing vessel above the fluid that will flow from below when the partly established vacuum produced by such sealing is broken, and air admitted to equalize pressure of the atmosphere above the fluid and at the point of discharge.

ELECTRO-THERAPEUTIC PROCESS AND APPARATUS.—Joshua M. Wardell, Cadillac, Mich. This invention provides a process and an implement to facilitate injecting a fluid into the vaginal canal, and then applying an electrical current to and disseminating it through the fluid.

Designs.

SPOON.—J. S. Rathbone, Mystic, Conn. The handle of this spoon has a configuration and ornamentation representative of the golden rod, and inclosing a bust-like figure of Washington, while the bowl is ornamented by a shield.

Another design for a spoon by the same inventor also utilizes the golden rod in a similar manner, but the handle has on the front a different bust-like figure and on the back a shield, while in the bowl is a representation of an eagle.

SCARF PIN.—John G. Brokaw, Somerville, N. J. The head of this pin is an oval ring having ornamental appendages, a disk representing an eye, another disk showing a heart, and intermediately a representation of clasped hands, while a laterally curved bar is arranged on one side of the oval ring.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

THE CALIFORNIA VINE DISEASE. A preliminary report of investigations. By Newton B. Pierce. Washington: Government Printing Office. 1892. Pp. 222.

This monograph is an excellent exemplification of the solid work done by the Department of Agriculture of Washington. It is excellently printed and illustrated, some colored prints being especially worthy of notice. It has a very long index, and, if it may be accepted as a pledge of the work to be done by that department in the future, it will have the tendency to make all farmers wish well for the last of the federal departments.

ENERGY AND VISION. By S. P. Langley. National Academy of Sciences. Vol. V. First memoir. Pp. 18; 4 plates.

In commencing his paper the author says: "While it is quite a familiar fact that the luminosity of any spectral ray increases proportionately to the heat in this ray, and indeed is but another manifestation of the same energy, I have recently had occasion to notice that there is on the part of some physicists a failure to recognize how totally different optical effects may be produced by one and the same amount of energy, according to the wavelength in which this energy is exhibited. I have undertaken, therefore, during the last few months, an experimental reinvestigation of this subject with such a statement especially in view." The experiments are very interesting to those who are fond of advanced physics and reflect great credit upon this eminent scientist.

NATURE STORIES FOR YOUNG READERS. Boston: D. C. Heath & Co. An instructive little book for young people. Price 30 cents.

LE REGIME DES EAUX A LILLE. Etude sur l'Hygiene et l'Assainement des Villes. By Ange Descamps. Publication of the Société Industrielle du Nord de la France. 8vo. Pp. 140. Maps and plans.

This report is chiefly interesting to civil engineers, and we might remark to the engineers of Lille, for the work is of purely local interest. The Lillois are evidently extremely well pleased with their water supply, their sewers—and themselves.

SCIENTIFIC AMERICAN BUILDING EDITION.

DECEMBER NUMBER.—(No. 86.)

TABLE OF CONTENTS.

- 1. Elegant plate in colors, showing a very attractive dwelling at Warberth Park, Pa., erected at a cost of \$4,150 complete. Floor plans and two perspective elevations. John Robinson, architect, Germantown, Pa.
2. Plate in colors showing a residence at Springfield, Mass. Perspective views and floor plans. Cost \$12,000 complete. Mr. Guy Kirkham, architect, Springfield, Mass. An excellent design.
3. A colonial residence at Newton Highlands, Mass. Perspective view and floor plans. J. W. Beak, architect, Boston. A picturesque design.
4. A pretty cottage erected at Bridgeport, Conn., at a cost of \$1,600. Floor plans, perspective, etc. A. M. Jenke, architect, Bridgeport, Conn.
5. A dwelling house erected at Warberth Park, Pa., at a cost of \$4,478 complete. Mr. C. W. Macfarlane, architect, same place. A model design. Floor plans and perspective.
6. A "Queen Anne" cottage erected at St. David's, Pa., at a cost of \$5,500 complete. A unique design. Perspective elevation and floor plans. F. L. & W. L. Price, architects, Philadelphia.
7. A residence in the "Colonial" style of architecture, erected at St. David's, Pa. Perspective view and floor plans. Cost complete \$5,800. F. L. & W. L. Price, Philadelphia, architects.
8. A residence on Golden Hill, at Bridgeport, Conn. Perspective elevation and floor plans. D. R. Brown, architect, New Haven, Conn. An excellent design.
9. A residence recently erected at Springfield, Mass. Floor plans and perspective elevation. Cost \$2,490 complete. Mr. A. B. Root, architect, same place. A pleasing design.
10. Picture of Aldworth, Sussex, the home of Lord Tennyson. Portrait of Lord Tennyson.
11. Sketch for a cottage at Saucelito, Cal.
12. Design for a thirty-story building.
13. Sketch of residence of Mr. Howard Bell, Atlanta, Ga.
14. Miscellaneous contents: Some of the merits.—Water tight cellars.—Read this with care.—Improve your property.—How to catch contracts.—The education of customers.—Erection of additional buildings.—Concave sounding boards.—A high railway bridge.—A complete steel house front, illustrated.—An improved woodworking machine.—Finely carved woodwork, illustrated.—Steam and hot water radiators, illustrated.—Plaster of Paris.—Disinfection by means of sulphur.—A novel newspaper building.—Fine steel ceiling in an art gallery.

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The Engineering Record, the recognized authority on municipal and building engineering, has recently been enlarged by the addition of a department in which notable industrial plants are regularly described and illustrated, the steam and power plants being a conspicuous feature. Recent publications include the great Ivorydale plant of Messrs. Proctor & Gamble, described in 23 columns and illustrated by 57 drawings. The steam plant at Ivorydale is separately treated in 13 columns and 31 drawings. The new foundry of Henry R. Worthington, at Elizabethport, N. J., 16 columns, 26 illustrations. National Mooter Company's foundry and brass finishing shop, Brooklyn, 13 columns, 29 illustrations. Niagara Power Plant (now in process of publication), 6 columns, 6 illustrations. Steam power plant of the Dwight Manufacturing Co., Chicopee, Mass., 9 columns, 7 illustrations. Machinery Hall steam power plant, 8 columns, 6 illustrations. Published Saturdays. 2 cents a copy. The Engineering Record, 277 Pearl St., New York.

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Notes & Queries

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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.

(4617) R. L. B. asks: Who was the inventor of the friction match? A. It is said M. Deroene made a friction match with a phosphorus tip in 1816. An impetus was given to the match industry by the Dobreiner lamp, and in 1827 the first really practical friction matches were made by Mr. John Walker, a druggist of Stockton-on-Tees. They were known as "Congreves" and consisted of wooden splints or sticks of cardboard coated with sulphur and tipped with a mixture of antimony sulphide, potassium chlorate and gum. Each box contained 84 and they were retailed at a shilling. With each box there was supplied a folded piece of glass paper, the folds of which were to be tightly pressed together when the match was drawn through them.

(4618) R. F.—To become a first class electrician or electrical engineer, you will need, first of all, a good mathematical education. If you have not a good education, you can of course secure it by studying the ordinary school books. If you are well up in mathematics, the rest is simple and plain. By studying electrical books you can acquire a knowledge of elec-

tricity. Latin, while it is desirable, is not absolutely necessary to an electrical engineer. We would suggest the following books for your use: "Experimental Science," Ayrton's "Practical Electricity," Thompson's "Dynamo Electric Machinery," Kempe's "Hand Book of Electrical Testing," Lockwood's "Electrical Measurements," Sloane's "Electrical Arithmetic."

(4619) R. M. F.—German silver has 13 times the resistance of copper. It requires of No. 16 copper wire 234 1/4 feet for the resistance of 1 ohm. As stated above, it will require only 1-13 of this amount of German silver of the same size for 1 ohm. With this as a basis, if you know the resistance of your lamp, you can make the necessary calculations.

(4620) W. P. C.—You can make your moulds of wood or metal. If you intend to use them a great deal, it would, perhaps, be well to make them of hard bronze. Your clay cylinder should first be dried in the open air, then heated slowly to a red heat and kept at that heat for several hours. It requires experience to judge when the work is done. We would suggest the purchase of a work on pottery.

(4621) O. J.—There is very little action in the battery referred to when the circuit is open. Carbon pieces can be granulated, and pulverized and moulded together after being mixed with a little flour and molasses and then baked. See "Experimental Science," for information on moulding carbons. For points on nickel and silver plating consult SUPPLEMENT, No. 310.

(4622) T. J. R.—If most of the lines of force pass to the armature as indicated by your sketch, it serves to render the core more magnetic and thereby increases the efficiency of the machine. It is not definitely settled that it is advantageous in all machines to provide teeth as suggested.

(4623) W. Z. writes: We have a private telegraph line of 12 instruments, each wound to 20 ohms resistance. Could we run the line with a dynamo? Will it be less expensive than batteries, considering that we construct the dynamo ourselves, and also have free use of water power to run it? A. You can operate your telegraph line by means of a dynamo, but we think a battery would be preferable for a small installation, as it is always ready for use.

(4624) J. F.—The only suggestion we can make in regard to your belt is to wet it evenly all over, stretch it until it is straight, and allow it to dry, afterward filling the leather with some of the dressings used for that purpose. We think, however, it will be better for you to write to the manufacturers of the belt. They may have more simple treatment.

(4625) C. L. S.—If you have placed the poles of your dynamo on an iron base, you cannot expect it to work as a dynamo, and it would not be a success as a motor. Place the machine of a wooden or a brass base, and you will find it will behave quite differently.

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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 December 13, 1892, AND EACH BEARING THAT DATE.

[Seenot at end of list about copies of these patents.]

Table listing inventions and their patent numbers, including: Account keeping device, W. W. Maxwell; Adhesives, production of, L. Kern; Aging and purifying liquors, apparatus for, A. L. Wood; Alarm, See Burglar alarm, Fire alarm; Animal trap, J. E. Brownell; Armature, electric machine, B. G. Lamme; Armature for electro-magnetic machines, R. Lundell; Atomizer, C. M. Blackman; Autographic register, W. H. Glennon; Automatic regulator, Houghton & White; Automatic switch, N. Newman; Axes, manufacture of, C. W. Hubbard, Jr.; Balance, L. Da Rozir; Baling slivers, machine for, W. M. Pawling; Band cutter and feeder, W. P. Burke; Banjos or violins, tail piece for, H. C. Middlebrooke; Barrel head machine, F. H. Kane; Bath tub seat, G. A. Keene; Battery, See Galvanic battery; Bed spring, J. B. Russell; Beer cooler, W. Gibson; Beer filling apparatus, H. Stockheim; Belt, electric, O. Kjosstad; Belt holder, W. F. Cleveland; Belting, O'Connell & Medcraft; Bench dog or clamp, G. B. Norman; Bicycle saddle, J. A. Stenberg; Bit, See Bridge bit, Dado or moulding bit; Blacking kit, boot, H. Pistorius; Blank feeding device, W. W. Miner; Block, See Snatch block; Blower, centrifugal, M. R. Ruble; Bobbin used in spinning and twisting frames, J. H. Wilson; Boiler, See Steam boiler, Tubular boiler; Boiler, T. L. & T. J. Sturtevant; Boilers, downdraught furnace for steam, J. F. Wangler; Bolting reel, Bour G. L. Jarrett; Bottle stopper lock, F. Jordan; Bottle washer, S. R. King; Bottle washer and rinser, O. Eick; Box, See Fruit box, Paper box; Box machine, J. Neef; Box machine, C. W. Roberts; Bracket, See Sign bracket; Brake, See Car brake, Roller brake; Brick, drying, C. J. Dion; Brick machine, S. P. Babcock; Brick press, G. H. Babcock; Bridge, L. Barnes; Bridge bit, W. J. Harnden; Bundle carrier and band cutter, A. Booth; Burglar alarm, W. W. Climenon; Burner, See Gas burner, Lamp burner, Oil burner.