

tial oils can best be used to give an agreeable odor to flour paste? A. Oil of cloves. 3. Please give a recipe for a good mucilage, one that will keep? A. Gum arabic solution perfumed with oil of cloves. 4. When I make a gum out of dextrine, it is of a brown color. How can I make it white without disturbing its keeping qualities? A. Use pure dextrine. Filtering through bone black will tend to improve it.

(2809) M. M. asks: 1. What is the E. M. F. of a plunging bichromate battery with 2 carbon and 1 zinc plates 4x6 inches each? A. Very nearly 2 volts. 2. How many amperes of current will it give? A. On a short circuit of 0 resistance the battery would yield a current of from 4 to 8 amperes. 3. What is the voltage of the simple electric motor described in SUPPLEMENT, No. 641? A. It requires a current having from 8 to 12 volts E. M. F. 4. What is its current capacity and what part of a horse power will it develop with the battery mentioned? A. It requires a current of 6 to 8 amperes and will develop about 1/4 horse power under favorable conditions.

(2810) W. G. asks: Can you tell me 1. How I can clarify bleached shellac varnish, for use on drawings? A. Long settling might answer. 2. Also if there is anything better for the purpose than the above varnish? A. Try Canada balsam or dammar varnish thinned with turpentine, or if you wish an alcoholic solution, use gum sandarac varnish.

(2811) C. A. W. asks: 1. What would you dissolve phosphorus in, so you could apply it with a brush on a wall to have it luminesce at night? A. Olive oil. Balmain's luminous paint is better. See SUPPLEMENT, Nos. 229, 249, 497. 2. What is the fastest printing press in the United States, and how many impressions will it take, and how many completed papers will it print a minute? A. The Hoe perfecting press; it will print and fold 500 eight page papers a minute, the size of the page being about 17 by 22 inches. 3. What pay does the average machinist get, and is that a good trade for a young man to learn? A. It would be hard to strike an average that would be worth anything; the wages vary from \$2 to \$5 a day. It is a good trade, but requires intelligence and hard work to get to the top. 4. How do you temper drills, so they will bore the hardest steel known? A. Heat to dull redness and plunge into a strong solution of zinc chloride. This hardening is only superficial and will have to be repeated after the drill is ground.

(2812) H. L. J. asks: Will you please inform me how to prepare canvas for oil painting? A. Nail the canvas on the stretcher, then give it a coat of thin glue size. Allow this to dry, then apply paint of the desired tint with a palette knife. The paint should have about the consistency of that sold in artist's tubes.

(2813) H. J. D. asks how to make white stain for the bottoms of shoes. A. Leather is bleached with a solution of oxalic acid. It is apt to injure the leather.

(2814) G. R. asks what the chemical ingredients are in the smoke emitted from soft coal. A. Principally carbon and vapor of water, with possibly minute quantities of hydrocarbons.

(2815) McF. & Co. ask: Why cannot water be made by gravity to run through a square coil of pipe, such as is sometimes used in the heaters when laid in a horizontal position? By pouring water in at the top it will not run out at the lower end. We think we know the air prevents it, but why does it? We certainly know the water is heavier than the air, and think that three inches or four inches of head should force both the air and water down and up through the returns of pipe and down out through bottom outlet, but it won't. We have tried it. A. A coil, either square or circular, with a number of turns, when laid on its side, forms a series of siphons, in which, if there is but one turn, water will flow through when the ends terminate on a level with the top and bottom of the coil. When there are two turns, the head where the water is poured in must be twice as high as the diameter of the coil, with three turns, three times the height and so on. The coil becomes a series of siphons, each siphon after the first re-enforcing the preceding siphon by its own hydrostatic pressure. Thus the first coil or siphon overflows and the water drops to the bottom of the second, and seals the air in the down leg and forcing the water up the next leg, the air remaining in the down leg, and so on through a series, each upward leg of water adding its quota of hydrostatic pressure to be overcome by adding to the height of the water inlet.

(2816) T. P. A. writes: Suppose the + wire of an incandescent circuit is grounded, the - wire being perfectly insulated, does any current go to ground? If not, what is the object of ground detectors? A. If one wire is grounded and the other is perfectly insulated, there would be no circuit, and as a consequence the current would not flow. Perfect insulation, however, is impossible. With the best there will be a small leakage, but this is negligible. The object of a ground detector is to determine when both branches of the circuit are grounded to such an extent as to interfere with the working of the circuit. 2. I have been told I could get a shock by grounding, say + wire, the - being perfectly insulated. I say no. What do you say? A. Generally enough of the current will find its way to the ground by leakage to give a serious shock. In the case of some arc light circuits, a ground connection through the body has proved fatal.

(2817) G. R. asks: Between what ages can a boy serve as a "page" in the national House of Representatives? What is the salary paid, and do they get pay monthly, whether House is in session or not, and about how many pages are required in that House? A. The House of Representatives has thirty-two pages, who get \$75 per month during the session, nothing when House is not session. A boy is eligible at 12 years of age and can remain as long as he has a good political backing up to 24 years of age.

(2818) F. F. V. asks: If 25 open gas jets are burning to the best advantage in a room 18 by 18 feet, and the same amount of gas is burnt in an improved gas stove, in a room the same size, will the temperature register the same in both rooms, and if so, why? And if not, why? A. There will be but little

difference in the total amount of heat. The gas jets would overheat the top of the room, while the gas stove would equalize the heat by heating the air near the floor, and would also produce a general circulation and equalization of the heated air throughout the room. The thermometer, if hung high, would indicate in favor of the gas lights.

(2819) J. R. asks: How are plans for exterminating Australian rabbits entered for the prize with the New South Wales government? A. Address Hon. F. Abigail, Sec. for Mines, Sydney, New South Wales.

(2820) J. A. W. asks: 1. Can you furnish me with a book containing the recipes for making gold, silver and nickel solutions? A. We supply Watt's "Electro-Deposition of Metals," \$3.50 by mail. Also see SUPPLEMENT, No. 310, for a very good article on the subject. 2. Can you furnish me with a recipe for coating brass that will wear well and withstand the action of hot potash and cyanide of potassium? A. This is almost an impossibility. You might cover with an India rubber tube, or even deposit India rubber on it by deposition. This would have then to be vulcanized, preferably by treatment with chloride of sulphur dissolved in naphtha, followed by heating toward the boiling point of water.

(2821) H. H. writes: Can you give me a receipt for an ink (waterproof) that will do just as well for drawings as the so-called India ink? A. We recommend you to rub up India ink in a solution of shellac in borax water. If it were not for its corroding qualities, an ammoniacal solution of shellac would give an absolutely waterproof vehicle for India ink.

(2822) C. L. H. asks: I am a stamp collector wishing to know how to make adhesive paper to hinge stamps in an album. A. Nothing is really better than solution of gum arabic just perfumed with oil of cloves. Postage stamp mucilage has often been published, as follows:

Table with 2 columns: Ingredient and Quantity. Dextrine 2 parts, Acetic acid 1 part, Water 5 parts, Alcohol 1 part.

(2823) J. V. D. writes: I have a quantity of cider that has taken up a taste from a cistern coated with tar. Is there any way by which the taste can be removed or neutralized? A. Try placing a bag of bone black in a sample of the cider. Success is doubtful.

(2824) A. B. asks how to cement polished glass to cast iron (planned smooth). I have tried Major's cement; it sticks good, but in taking it off with hot water, small pieces of glass break off and spoil it. I wish to know if there are other cements that will hold as tight as Major's, but can be removed without injury to the glass, and how to do it. It must be a liquid cement. A. Soak fine white glue or gelatine in water over night. Pour off the surplus water and add molasses equal to about 25 per cent of the bulk of glue. Heat gently and stir until the mixture is formed. You can vary the proportion of molasses to suit. Glycerine may be used instead of molasses.

(2825) A. W. B. asks: 1. What causes the singing noise that is heard on telegraph poles? A. The noise is due to the vibration of the telegraph wires, produced by the movement of the air. 2. Has alcohol ever been frozen? If so, at what temperature? A. Alcohol has been rendered viscid by low temperature, but never solidified. 3. Can the simple electric motor be arranged to produce the electric light, and how? A. Yes. By using a cast iron field magnet and winding the magnet and armature with No. 20 wire. 4. What is the best work on physics? A. It would be difficult to say which is best. For the advanced scholar, Daniell, Ganot, or Deschanel can be recommended, while "Experimental Science" is suited to all interested in physics. 5. Are the paper conductors in the simple Holtz machine placed on the same side of the apertured disk, and next to the revolving disk, when they are in position? A. They are both on the side of the disk remote from the revolving plate.

(2826) M. A. H. writes: What number complies with the following proposition: That if 5-7 of its 2 1/2 be multiplied by 9-12 of 5-10 of its 2 1/2 and then add 454354239999-5227344295 to the product, and then extract the 6 1/2 of the result, then divide by 20 and add 13 to the quotient, the final result is equal to 30? A. The easiest way is to commence at the bottom and work upward as far as possible. Thus 30-13=17=the quotient last named. Multiply this by 20, giving 340, which by the statement is the 5th root of the sum of the long number given (454354239999-5227344295) and of a certain other number. Then 340^5=454354240000. From this the given number must be subtracted, giving 0-4772655705. By the conditions 5-7x 9-12x 5-10x 2 1/2=0-4772655705. The first member of the equation reduces to 225-840x^2 and the whole equation reduces to x^2=1-78177813. Solving, preferably by logarithms, we find x=2.

NEW BOOKS AND PUBLICATIONS.

ELECTRICITY IN DAILY LIFE. Illustrated. New York: Charles Scribner's Sons. 1890. Pp. xv, 288. Price \$3.

The articles on electricity which have appeared in Scribner's Monthly Magazine during the past year are here collected into book form, producing a volume similar in its way to American Railways, produced by the same firm in the same way. The reputation of the authors of this work and the choice of topics are the best guarantee of its excellence. The illustrations are of the quality familiar to the readers of the magazine, and are also very numerous and pertinent to the subjects treated. It forms about as good a popular presentation of the subject as has yet been put before the public.

The Illustrated American.—This beautiful weekly publication, which is now issued in an improved form, so as to bind into conveniently sized volumes for the library, continues to be of as fine quality as ever. The issue for the week ending January 31 has, as opening article, the Geo. I. Seney collection of paintings, with an excellent portrait of Mr. Seney. Many of the pictures of the celebrated collection are reproduced, and

marginal cuts give the portraits of the famous artists whose works are displayed. The reproductions are admirable, giving all the softness and general effect of the original works. The great collection of Mr. Seney, which has a wide reputation for its excellence, is soon to be disposed of at auction in this city, and the Illustrated American gives the record of its masterpieces. Another article in this number describes and illustrates "Sioux Women at Home" as seen at the Pine Ridge Agency. The everyday life of the agency Indian is well shown, with graphic pictures of the semi-civilized product reproduced from photos taken on the spot. Another article is devoted to the U. S. S. Philadelphia, and, with numerous illustrations, gives an excellent idea of the great flagship of the North Atlantic Squadron. Music, literature, history, and last, not least, "Women," receive their meed of attention in this issue.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

January 27, 1891,

AND EACH BEARING THAT DATE.

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

Table of inventions with columns for inventor name and patent number. Includes entries like 'Adding machine, R. Corbin', 'Adjustable chair, C. H. Knight', etc.

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LIST OF Books on Electricity.

Alternate Current Machinery. By Gilbert Kapp, Assoc. M.I.C.E. Reprinted from the Minutes of Proceedings of the Inst. of Civil Engineers, London, 1889. .50

Alternate Current Transformer in Theory and Practice. Vol. I. The Induction of Electric Currents. 500 pages, fully illustrated and with copious index. By J. Fleming, Esq., London, 1889. \$3.00

This book treats both practically and theoretically the subject of Electric Current Induction and the Alternating Current Transformer. .50

Arithmetic of Electricity. By T. O'Connor Sloane, A.M., E.M., Ph.D. This work gives Electric Calculations in such a simple manner that it can be used by any one having a knowledge of Arithmetic. It treats of calculations for wiring, resistance in general, arrangement of batteries for different work, and is supplemented by the most practical series of tables ever published. It is absolutely indispensable to the practical electrician, as well as to the amateur. Fully illustrated, 1891. \$1.00

Art of Electrolytic Separation of Metals. By G. Gore. Theoretical and practical. Fully illustrated. 8vo, cloth. London, 1880. \$3.50

Dynamo. How to make a Dynamo. A Practical Treatise for Amateurs. Containing numerous illustrations, and detailed instructions for constructing a small dynamo to produce the electric light. By Alfred Crofts, 12mo, cloth. London, Second edition, 1888. .50

Edison and his Inventions. Including the many incidents, anecdotes, and interesting particulars connected with the early and later life of the great inventor. Also full explanations of the newly perfected phonograph, telephone, tasmeter, electric light, and all his principal discoveries, with copious illustrations. Edited by J. B. McClure, M.A. Chicago, 1889. \$1.00

Electric Batteries. Elementary Treatise on. From the French of Alfred Niandet, translated by L. M. Fishback. Fifth edition. N. Y., 1888. \$2.50

Electric Lighting. The Elements of Electric Lighting, including Electric Generation, Measurement, Storage, and Distribution. By Philip Atkinson, A.M., Ph.D., author of "Elements of Static Electricity." Contents: Electricity a Mode of Molecular Motion; Alternate Current Dynamos; Direct Current Dynamos; Electric Taps; Uses of Electric Measurement; The Arc Lamp; The Incandescent Lamp; The Storage Battery; Electric Distribution, etc. Fourth edition. 260 pages, 104 illustrations. 1889. \$1.50

This is a very complete work, and should be in the hands of all who have to do with electric lighting apparatus of any kind whatever. .50

Electricity. In Theory and Practice, or, the Elements of Electrical Engineering. By Lieut. Briley A. Blake, U. S. N. 258 pages, and many illustrations. 1888. \$2.50

Electricity. The A B C of. An elementary manual giving in simple language a general outline of the science. 108 pages, with 36 illustrations. Wm. H. Meadowcroft. 12mo, cloth, 1889. .50

Electricity in our Homes and Workshops. A practical Treatise on Auxiliary Electrical Apparatus. With numerous illustrations. Sydney F. Walker. 12mo, cloth. London, 1889. \$1.50

The author aims to explain in simple terms the ordinary every day work of some of the forms of electrical apparatus that are in use by outsiders, and not under the supervision of electrical engineers. He appreciates that a connecting link is wanting between the electricity of the schools and the electrical engineering of practical life.

Electrical Instrument Making for Amateurs. By S. R. Botton. A practical hand-book. Cloth, 175 pages, 59 illustrations. .50

Electric Rules and Tables for the use of Electricians and Engineers. Revised and enlarged. 438 pages, 32mo. Roan. Sixth edition, 1888. \$2.50

Electricity and Magnetism. Elementary Lessons in Electricity and Magnetism. By Sylvanus P. Thompson. 171 illustrations and 442 pages. 1889. \$1.25

Electrical Dictionary. A Dictionary of Electrical Words, Terms, and Phrases. By Edwin J. Houston, A.M., Electrical of the International Electrical Exhibition. 640 pages and 386 illustrations. 1889. \$2.50

The author aims to explain in simple terms the ordinary word, term, or phrase, and a brief statement of the science involved in the definition, and to insert when possible, a cut of the apparatus described or employed in connection with the word, term, or phrase defined.

Electro-Motors, How Made and How Used. By S. R. Botton. A Handbook for Amateurs and Practical Men. Illustrated. This book was originally prepared as a letter in reply to queries addressed to the Author on the construction of electro-motors, on their many modifications, and on their mode of workings. 12mo, cloth. London, 1880. \$1.20

Electro-Deposition. A Practical Treatise on the Electrolysis of Gold, Silver, Copper, Nickel, and other Metals and Alloys, with descriptions of Voltaic Batteries, Magneto and Dynamo Electric Machines, Thermopiles, and the Materials and Processes used in every department of the Art, and several chapters on Electro-metallurgy. By Alexander Watt, author of "Electro-metallurgy," "The Art of Soap Making," etc., etc. With numerous illustrations. Third edition, revised, corrected, and enlarged. London, 1889. \$3.50

Electricity for Engineers. By Charles Desmond. A Clear and Comprehensive Treatise on the Principles, Construction and Operation of Dynamos, Motors, Lamps, Indicators, and Measuring Instruments, also a Full Explanation of the Electrical Terms used in the work. Illustrated by nearly 100 Engravings, in 1 Volume. 12mo, 255 pages. Price. \$1.50

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Electric Light Installations and the Management of Apparatus. A Practical Handbook by Sir David Salomons, Bart., M.A., Assoc. Inst. C. E. member of Council of the Society of Telegraph Engineers and Electricians, member of the American Institute of Electrical Engineers. Fifth edition, revised and enlarged. With 99 illustrations. 348 pages. 12mo, cloth. \$1.50

Incandescent Wiring Handbook. With 35 illustrations, and 10 tables, by F. B. Pratt, Lieut. Royal Prussian Artillery, and author of "Dynamo Tenders' Handbook," "Bell Hangers' Handbook," 1889. \$1.00

Practical Electrical Measurement. (65 illustrations.) By J. Swinburne. London and N. Y., 1888. \$1.75

Practical Electric Bell Fitting. A Treatise on the Fitting-Up and Maintenance of Electric Bells, and all the necessary apparatus. By F. C. Allsop. With nearly 150 illustrations. 1889. \$1.25

Practical Electricity. A Laboratory and Lecture Course for First Year Students of Electrical Engineering based on the Practical Definitions of the Electrical Units. By W. E. Ayton, F.R.S. Nearly 500 pages, and 180 illustrations. Third edition. 1888. \$3.50

Practical Electrical Notes and Definitions.—For the use of Engineering Students and Practical men. By W. Perren Maycock, A.M. Inst. E. E. Second edition, revised and enlarged. 286 pages, with illustrations. 32mo, roan. \$1.75

Practical Electrician.—A Universal Hand-book on every-day electrical matters, including connections, and resistance coils, dynamo-electric machines, fire risks, measuring, microphones, motors, phonographs, photophones, storage and telephones. Being the Electrical portion of the "Third Series of Workshop Receipts." 135 pages, 12mo, cloth. 1890. .75

Telephone.—The Electric Telephone. By George B. Prescott. Second edition, revised and enlarged. 612 illustrations. 790 pages. 1890. \$6.00

The Electrical Engineer's Pocket Book. Modern Rules, Formulae, Tables, and Data. By H. R. Kempe. 32mo, leather. London, 1880. \$1.75

The Electric Railway. 250 pages, with illustrations. F. H. Whipple. 8vo, paper. 1888. \$1.00

The Telephone. By Wm. H. Preece and Julius Maier, Ph.D. 30 chapters, 290 illustrations, and 452 pages. 1888. \$4.00

Voltic Accumulator. The Voltaic Accumulator, an elementary treatise. By Emile Rehnier. Translated from the French by J. A. Body. 1889. \$3.00

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Medicine for inhalation, G. W. Mowry. 18,912

Metals, compounds for cleaning and polishing, W. J. Ladd. 18,905

Mineral water, J. Moran. 18,901

Nursery products, including trees, plants, scions, and fruits, H. Jones. 18,911

Poison for vermin, Haskin & Todd. 18,910

Po.ter, fuses, caps, and other articles for blasting purposes, New York Powder Company. 18,913

Remedy for liver and kidney diseases, Harter Medical Co. 18,903

Tableware, technically known as flat ware, W. H. Lyon. 18,906

Tin and terpe plates, Gummy, Spering & Co. 18,902

Whips, A. C. Barnes & Co. 18,897, 18,898

A Printed copy of the specification and drawing of any patent in the foregoing list or any patent in print issued since 1863, will be furnished from this office for 25 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York.

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