

NEW BOOKS AND PUBLICATIONS.

THE ELEMENTS OF ELECTRIC LIGHTING. Including electric generation, measurement, storage, and distribution. By Philip Atkinson, A. M., Ph.D. 260 pages, 12mo, 104 illustrations. Price \$1.50.

This work, although it has been condensed into a volume of less than 300 pages, covers very fully the field of electric lighting. It is intended as a popular handbook, and is free from unnecessary technicality and mathematical formulae. Beginning with the theory of the dynamo, it covers the ground of its development until the complicated form is reached as represented by the types used in our large plants. The subject of the electric lamp, both arc and incandescent, is treated in the same way, and the different systems, as represented by the Swan, Weston, Edison, Sawyer-Man lamps and others, are described and represented. A chapter is devoted to the subject of the secondary battery and its theory and practicability as a means of storing power is treated of. There is also a chapter on the method of distributing the electricity from a central station to the consumer or for use in lighting towns and cities. In this connection is discussed series and parallel installation, the electric regulator, the meter, and the different appliances that have become necessary with the introduction of the system of general illumination. The ground covered by this work is extensive, but the subject has been skillfully handled, and as a handbook for the practical mechanic, the beginner in electrical subjects, the student, or the general reader, it will be found of great value.

SWINE PLAGUE, WITH ESPECIAL REFERENCE TO THE PORCINE PESTS OF THE WORLD. An etiological, pathological, anatomical, prophylactic, and critical contribution to general pathology and state medicine. By Frank S. Billings. Lincoln, Neb.: Journal Company, State Printers. 1888. Pp. 414.

This monograph, issued by the University of Nebraska, is the second report from the patho-biological laboratory in charge of the distinguished author. The subject is treated very fully, but, from its nature, it does not lend itself to a review. The work may be noted, however, as attractively printed and bound and illustrated by a number of plates showing the appearance of the affected parts and of the micrococci characteristic of the diseases.

A TREATISE ON THE LAW OF BUILDING AND BUILDINGS: ESPECIALLY REFERRING TO BUILDING CONTRACTS, LEASES, EASEMENTS, AND LIENS. By A. Parlett Lloyd, of the Baltimore Bar. Boston: Houghton, Mifflin & Co. New York, 11 East Seventeenth Street. The Riverside Press, Cambridge. 1888. Pp. li, 618. Price 50 cents.

This work is strictly a law book, a manual of building law. It claims to be the first work upon its subject. Although it may seem rather designed for lawyers, it is one of those books that should be in the possession of all interested in building, as, owing to its extensive index, digests of decisions, and forms of agreement, it will be appreciated by such. It is distinctly American, and American decisions will be found liberally quoted. Mechanics' liens are very extensively treated, and chapters devoted to building contracts, building leases, etc., are given.

The Proceedings of the Michigan Engineering Society, at its ninth annual convention, in January last, constitute an octavo pamphlet of 144 pages, published by Messrs. Ihling Bros. & Everard, of Kalamazoo, and sold at 50 cents. Similar reports can be had of former conventions, since 1882, in which many valuable papers are preserved in permanent form for convenient reference.

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) E. F. B.—You will find the subject of japans treated in Spons' "Workshop Receipts," and in the "Painter's Encyclopedia." We can supply you with either for \$2.

(2) O. W. K. asks: 1. How many cubic feet of water gas is required to give the same heat as one pound of ordinary bituminous coal? A. About 15 cubic feet of gas. 2. Also how many cubic feet of air is required to effect the perfect combustion of a cubic foot of gas? A. From 7 to 12 cubic feet of air.

(3) H. A. E. asks: 1. Is common stove-pipe iron without the glaze on it just as good as Russia iron with the glaze on it for the magnet cores of simple electric motor? A. Almost as good. 2. How many carbons (each being one-half inch diameter by five inches long) will it take to get the same carbon element as you described, five by seven inches? A. Ten. 3. How many batteries will it take, each holding one

pint of electro-pion fluid, to drive the motor? A. About 20, arranged five in parallel. 4. Can the brush-holding disk be made out of wood just as well? A. It can be made of wood. Vulcanite would cost 25 to 50 cents.

(4) G. D. writes: I have an underground ice house with close board floor above. It has become so charged with carbonic acid gas, arising from the leaves with which the ice is covered, that we cannot go down with a lamp, which immediately dies out. I have tried throwing in quicklime, which does very little good. Can you tell me how to expel the gas, as it is very unsafe to go in? A. Slake the lime thoroughly with water before putting it in the ice house. Use the lime while still fresh. It is very dangerous to descend into a place that cannot support the combustion of a lamp.

(5) H. J. D. asks by what process oil and water can be mixed. A. By dissolving gum tragacanth or some similar substance in the water a mechanical mixture known as an emulsion can be produced. A caustic alkali such as soda will decompose the oil, and so effect a "destructive" mixture.

(6) E. P. asks if cigarettes are made with the hands like cigars or if made by machinery. A. They are made both ways. A good operator will make 1,200 per day by hand.

(7) H. W. S. asks: Could I run a dynamo with a one horse power water motor, and have it light a private house with incandescent lights to the extent of about 175 candle power? What dynamo should I use? A. A one horse power motor would not be sufficient for your purposes. Double that size would be preferable. Use the dynamo described in SUPPLEMENT, No. 600; wind three or four extra layers on the field and place it in shunt.

(8) H. D. asks what processes are used to refine lard, or where he can find information on this subject. A. The fat, as fresh as possible, is treated in a boiler with steam at 60 to 80 pounds for 6 or 8 hours. The separated lard is floated off by adding water to the boiler, or all is run off together and the lard separated when cold.

(9) F. W. B. asks: 1. Can the armature core be made—for the 8 light dynamo—of iron wire in the same manner as the drum armature given for the hand power machine and give as good results as the ring armature? A. Yes. 2. Why should the iron wire be varnished? A. To avoid metallic contact. The object of dividing a core is to avoid Foucault currents. If the parts were in contact, the core would be practically solid, and the dynamo would be of much lower efficiency.

(10) J. C. F.—Gas made from kerosene is entirely too heavy for ballooning purposes. Hydrogen may be made by acting on zinc or iron scrap with acid or by passing steam through a tube filled with white iron scrap. This is a very buoyant gas, but leaks out rapidly from the balloon.

(11) F. P. A. asks: Will you please tell me how to prepare and apply the black enamel used on bicycles? A. The best quality of japanning put on by oven process is employed. For description of same we refer you to "Workshop Receipts," vol. iii., which we can send you for \$2 by mail.

(12) J. J. C. asks: 1. Please give me the receipt for a good baking powder, and directions for making. A. Mix together perfectly dry 83 parts by weight of bicarbonate of soda and 188 parts of acid tartrate of potash (cream of tartar). 2. I have a pint bottle of Stephens' commercial ink which writes very lightly. What kind and what quantity of nut galls shall I use to darken it? A. We would not advise you to add anything to the ink. You would do better to buy a new bottle. 3. What must I mix bronze powder with so as to be able to use it as gold paint? A. Copal varnish. 4. I have an elegant four in hand scarf which has been soiled by wearing in hot weather; how can I make it fit to wear? A. Try sponging with ammonia and alcohol. It is doubtful if you can remove the stains.

(13) M. W. S. asks: How is absorbent cotton, used by surgeons, made? A. Take of the best quality of carded cotton batting any desired quantity, and boil it with a 5 per cent solution of caustic potassa or soda for one-half hour, or until the cotton is entirely saturated with the solution, and the alkali has saponified all oily matter. Then wash thoroughly, to remove all soap and nearly all alkali, press out the excess of water, and immerse in a 5 per cent solution of chlorinated lime for 15 or 20 minutes, again wash, first with a little water, then dip in water acidulated with hydrochloric acid, and thoroughly wash with water, press out the excess of water, and again boil for 15 or 20 minutes in a 5 per cent solution of caustic potassa or soda; now wash well, dipping in the acidulated water and washing thoroughly with pure water. Afterward press out and dry quickly. The amount of loss by this process is practically 10 per cent. A sample of 360 grains lost, on boiling with alkali and bleaching, 15 grains, or 4.17 per cent, and 270 grains of this bleaching sample lost, on again boiling with an alkali, 14 grains, or 5.18 per cent, a total loss of 9.35 per cent. When properly made, if dropped into water it should immediately become saturated and sink to the bottom.

(14) T. P. H. asks: 1. Why should the combined resistance of all the relays on a telegraph line equal the resistance of the line and battery? A. Any such rule is empirical. The correct method is to have the resistance of the entire external circuit line relays and all equal to the resistance of the battery. By applying Ohm's law it will be found that with this arrangement the maximum current is obtained with the minimum number of cups. But for economy of chemicals the resistance of the battery should be as low as possible. 2. What is the best elementary work on electricity and the telegraph? A. We recommend, and can supply by mail, Larden's "Electricity for Schools and Colleges," price \$1.75; also Thompson's "Elementary Electricity," price \$1.25; also "Electricity and the Electric Telegraph," by Prescott, in two volumes, price \$5.

(15) C. W. asks: 1. What acids will combine with asbestos? A. No acid will combine with it. 2. I wish to polish some steel plates, 2 1/2 x 3 x 1/8 of an inch thick, so that they are perfectly plane on one side. In what way can I do this the easiest? A. Plane them as true as possible, then grind them with emery in sets of three, rubbing first plate against second, and then third against first and second until finished, so as not to grind them in pairs. 3. Be kind enough to tell me what is the powder inclosed. I think it is a carbonate of something, and have not the apparatus to fully test it. A. The powder is a carbonate. Analysis will cost \$5. 4. Can you furnish me with a new book called the "Techno-Chemical Receipt Book"? A. We can send the "Techno-Chemical Receipt Book," by mail, for \$2.

(16) A. B. asks: Is there anything that will make the ink that is used with rubber stamps indelible when used to stamp linen? A. Probably printer's ink is the most available. Or try the following: 100 gr. hydrochlorate aniline, 60 gr. sodium chlorate, 3/4 oz. water, 1/4 gr. vanadate of ammonia. Collect and dry the precipitate and make into paste with gum arabic, water, and glycerine.

(17) J. L. B. asks for the best way to test acetic acid. A. Test acetic acid either by acidimetry with standard solution of alkali, or less perfectly by specific gravity. We refer you to Dussauce's "Treatise on Vinegar," price \$5.

(18) W. V. D. asks: What are the cross hairs in instruments for surveying and leveling made of, and how put in? A. Spider web or unspun silk fibers or fine platinum wire are used. They are cemented across a ring which is secured within the tube of the telescope.

(19) T. G. P. asks: What is the correct pronunciation of dynamo and dynamite? A. Dina'mo, di'namite, the first syllable pronounced in both cases short like "bit."

(20) F. S. asks: What process is the best to fill up the pores of Portland cement tiles or artificial stones? A. We can recommend no process that would be thoroughly satisfactory. Melted paraffine might be tried applied to the tiles while warm, or the tiles might be washed with or dipped in cement and water mixed to the consistency of cream.

(21) Acekay writes: I have a tortoise shell watch chain, from the links of which the polish is worn. How can it be conveniently repolished? Also what is the general process of finishing and polishing tortoise shell? A. Tortoise shell is finished by scraping. Then it is polished with pulverized charcoal and water on a woolen cloth perfectly free from grease. This is followed by water and washed chalk or whiting. The article being moistened with vinegar. Finally it is hand-rubbed with dry whiting or rotten stone. From above description you can tell how to treat your chain.

(22) W. F. S., Jr., asks: Can iron or steel be deposited on any of the other metals? Also, would it be possible to plate a worn bearing with iron or steel? A. Yes; see SCIENTIFIC AMERICAN, June 9, 1888, p. 359, and SUPPLEMENT, No. 605, which we can send by mail for 10 cents. It would be doubtful if it would be of practical use.

(23) A. A. S. asks: 1. In experimenting with carbon oil from petroleum would there be any danger of getting an explosion with acids and the oil. A. There is not much danger of an explosion, though it is a possibility. 2. Can you give the characteristics of Lima, Ohio, crude oil? A. In early wells the oil had a sp. gr. of 36° B., later it has reached 37° and 38° B., and in one instance (McCullough well) 41° B. It contains a large percentage of offensive sulphur compounds. It is claimed that it yields 65 per cent of completely deodorized illuminating oil. For analysis address David T. Day, Esq., United States Geological Survey, Washington, D. C. 3. What will precipitate lime from a solution? A. It depends on the form in which it is present. Oxalate of ammonia, a poison, is the universal precipitant. When the lime is in solution as bicarbonate, boiling will do it; when as sulphate, alcohol will answer.

(24) J. P. E. asks: Can beeswax be plated with nickel, and if so, how should I proceed? A. Coat it with plumbago, dust on fine iron powder, immerse in a sulphate of copper bath for a few minutes, and then plate with battery.

(25) C. S. P.—Exposure to the sun under glass is said to bleach ivory. For binoxide of hydrogen bleaching we refer you to SUPPLEMENT, No. 339, which we can send you by mail for ten cents.

(26) G. A. J. asks: 1. What is used to put a polish on brass, such as hanging lamps and the like? A. Shellac dissolved in alcohol. Great care and absolute cleanliness is needed in applying it. The metal after polishing with rotten stone and oil must be washed and dried and shellacked while hot. 2. What is good to remove fly specks from brass? I have tried soap and water, gasoline, kerosene, etc., but have not succeeded. A. Rub off with ground pumice, followed by rotten stone, and apply shellac as above. 3. Is there any lubricating oil void of acid? A. Yes. 4. Does an ounce of steam at 500° occupy more space than at 212°? A. Yes; about 50 per cent more volume.

(27) M. N. writes: Is it necessary to have the windows of a school room (heated by hot air, with ventilators around the sides near the floor) down at the top? It is very uncomfortable to have the windows down a foot or more, but our teacher insists on having them so. A. We favor ventilation, and believe that your teacher is right.

(28) C. C. G. asks for a recipe that will produce an innocent green color, with linseed oil. A. Use chrome green, a mixture of lead chromate and Prussian blue.

(29) T. J. asks: Can a molecule exist apart from gravity? A. Gravity is an inherent property of matter. If all matter were annihilated except one molecule, it would possess gravity, although nothing would exist for it to react upon. It would be an analogous case to the firing of a cannon in the midst of the desert of Sahara, where sound would be produced, though there would be no being to hear it.

(30) Old Reader asks how to clean out paint brushes that are hard with old paint. A. Soak the bristles only in washing soda and wash out with hot water. Soaking in turpentine may be sufficient, and if so, will be less trying to the brush.

(31) T. S. C. asks: What can I put in gum arabic to keep it from souring and at the same time keep it neutral? And also to prevent it from cracking when mixed with color, as I want to use it for coloring photos. I have tested most everything without effect. A. Glycerine or honey will prevent cracking. A very little oil of cloves will preserve it from turning sour.

(32) L. M. W. asks: I would like to learn how to take tin types. Could you give formulas for the sensitive developing and fixing baths, also how to repair and place the film on the plate? A. See the very complete formula published in "The Ferro-type, and How to Make It," which we can supply for 50 cents.

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

October 9 1888

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 Adding machine, Alarm, Alloy, Auger, Axle box lid, Bag holder, Bar, Barley flakes, Battery, Batting machine, Bed, Bicycle, Billiard cue, Binder, Bit gauge, Blast pipe, Block, Board, Bobbin winding machine, Boiler cleaner, Boot or shoe uppers, Bottle rinsing machine, Bottles, Box, Box or canister, Brake handle, Brake shoe, Brick machines, Brush, Brush heads, Buckets, Buildings, Bureau, Burglar alarm, Burner, Bustle, Butter worker, Button, Button setting tool, Cable grip, Can, Cane, Car buffer, Car coupling, Car heater, Car heater, Car, railway, Car, stock, Car ventilator, Car wheel and axle, Car wheels, Cars, heating and cooling railway, Carbon contact or commutator brush, Card, feeding, Carpet fastener, Carriage, baby, Carriage wrench, Casting hooks, Casting metal ingots, Centering gauge, Chairs, foot rest, Chimney cap, Chlorine, Chuck, self-oiling punch, Churn closure, Cigar bunching machine, Cigar seller, Clamp, Clock, alarm, Clothes pounder.