

NEW BOOKS AND PUBLICATIONS.

ENGLISH AND AMERICAN RAILROADS COMPARED. By Edward Bates Dorsey, C.E. New York: John Wiley & Sons. 1887. Pp. 142.

This book contains an essay for which the Norman gold medal was awarded by the American Society of Civil Engineers. The least we can say of it is that the medal was most worthily bestowed. The work is an exhaustive review of financial and other data of English and American railroads, a summary statement of the good and bad points of both, and a general comparison of results. As regards work done by given amount of rolling stock, locomotives, etc., the comparison is largely in favor of the American system. Yet the author condemns the weak points of American practice without hesitation. Especially does he speak of the lack of the block system. This is to his mind, and very properly, a sine qua non of good railroad work. The narrowness of the English cars is quite striking. Owing to the construction of their stone station platforms, bridges, etc., the car bodies cannot be widened. Hence the Pullman cars are much narrower than with us. The story of an American engineer receiving 2,000 guineas for two hours and a half testimony before a parliamentary committee has, to the patriotic practitioner, a very pleasant sound. We commend the book to all interested in the railroads of the world.

ELEMENTS OF MODERN CHEMISTRY. By Adolphe Wurtz. Third American edition. Translated and edited by Wm. H. Greene, M.D. 132 illustrations. Philadelphia: J. B. Lippincott Co. 1887. Pp. 770.

This admirable little work is well worthy of its distinguished author. It gives in clear and intelligible order the modern views of chemistry, representing about such a work as the well known Fownes' Chemistry. It is, according to the author, designed as a text book, but few chemists are not at frequent intervals indebted to such manuals as a quick and ready reference in the course of their work. Mendelejeff's law and the other recent chemical discoveries or theories find a place in it. The division and arrangement is the regulation one, beginning with hydrogen and going on through the elements, metalloids, and metals, to organic chemistry. This is fully treated, and forms a most valuable part of the work. The illustrations are, to a great extent, the familiar ones, but they form quite an essential portion of the book.

WITHIN AND WITHOUT. Chicago: J. Thompson Gill, Manager C. & B. Publishing Co. 1887. Pp. 318.

This is a novel supposed to touch upon philosophy, legal ethics, and religion. It is in four parts, and seems to be very brightly written. We are not prepared to give an elaborate opinion on the author's views, which we find summarized in the introductory pages.

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) C. S.—The fine standard rules, callipers, and scales of steel for machinists' use have their divisions cut in a dividing engine, the cutter being similar to a diamond lathe tool. It is only the cheap squares and scales that are stamped. A few scales and tape measures are printed and bit with acid. These are readily recognized on inspection.

(2) P. G.—For metallic putty joints for flanges: To equal parts of white lead and dry oxide of iron (Prince's metallic paint) add their bulk of fine cast iron borings (sifted); mix and knead with the hands, adding boiled linseed oil sufficient to make the mass a stiff putty. Lay this under the flange about three-sixteenths inch thick, draw the flange down with the bolts, hammering the flange all around to bring it to a solid bearing. Rust joints are only made in socket joints, or in places where the borings can be driven with a calking tool.

(3) A. W. M. asks the best method of protecting a 1 inch steam pipe laid underground. A. A wooden box 4 inches in diameter inside for 1 inch pipe, coated with tar or asphalt, with notched cleats every 12 feet to retain the pipe in the center of the box. Fill in around the pipe loosely with mineral wool or pulverized charcoal, and cover without nailing, to facilitate repairs if ever found necessary. Lay tar paper over the joints of cover.

(4) P. J. F. asks: How is the resinous and foreign matter precipitated in alcoholic solution of Jamaica ginger, retaining the strong aroma of the ginger? A. By shaking the fluid extract with 1/2 its weight of magnesium carbonate and filtering. 2. How is soluble essence of lemon prepared, so that when diluted with water and sirup it retains the strong aroma of lemons without the essence or oil floating on the surface of the water and sirup? A. Take fresh lemon peel, which, after removing the white, pulpy portion and grinding, is macerated with dilute alcohol.

(5) J. M. H.—For restoring the broken teeth of a gear for the purpose of a pattern, we think there is nothing cheaper or easier worked to the re-

quired form than plaster of Paris. Drill a few small holes in the broken surface of the tooth, drive in some wooden pegs, and build up the tooth with plaster. After setting it can be readily shaved to shape, which if not obtained at the first effort, more plaster can be added and the surplus shaved off to make the tooth perfect. When finished, varnish with shellac as with other patterns.

(6) J. W. P. asks about the process of annealing cast iron, and whether it can be done on a small scale to advantage. A. Castings of moderate to very small size, that are hard, can be readily annealed by packing in a cast iron box or a blacklead crucible, with burnt core sand or old moulding sand mixed with a little pulverized charcoal. Heat to a full red in a forge fire or furnace if convenient. Retain the red heat for an hour or two, according to hardness of castings; then allow to cool slowly by covering the fire and allowing it to die out. A few trials will suggest the proper time for keeping up the heat.

(7) A. T. W.—The elevation of the outer rail does not compensate for the difference in length of the outer and inner rail on a curve. Generally, in a free run around a curve, the inner wheel slips because the centrifugal force throws the flange of the outer wheel hard against the outer rail, producing additional friction and pressure upon the outer rail. This may be reversed when, by slow speed, the engine has a live pull on the train when rounding a curve; then the wheels are pulled hard against the inner rail, and the centrifugal force is not equivalent to the draught of the engine.

(8) T. E. C. asks: 1. Is there any way to remove the nickel from brass articles that were imperfectly plated? A. The only way is to refinish. Acids will roughen the surface. 2. How to "snell" brass. A. Do not know the term. 3. How many minerals are known to science, and which is the most valuable? A. Several thousand. The diamond is most valuable. If you mean metals, there are 54 elements counted as metallic, though scientists do not all agree as to several of them.

(9) O. T. asks: What is there that will keep a liquid made of egg and acid phosphate without changing the taste? A. Add a small quantity of salicylic acid.

(10) J. R. W. desires a good receipt to clear the voice and remove temporary hoarseness caused from speaking and singing. A. Take of beeswax two drachms, copaiba three drachms, powder of licorice root four drachms; melt the copaiba balsam with the wax in a new earthen pipkin; when melted, remove them from the fire, and mix in the powder; make the pills of three grains each. Two of these pills to be taken occasionally three or four times a day.

(11) W. L. R. asks: 1. What is the greatest perpendicular height that water can be raised with a suction pump? A. About 28 feet is all that can ordinarily be depended upon, 33 feet being about the ultimate limit. 2. How many cubic inches are there in one gallon, and is the American gallon or imperial gallon used for measuring capacity of tanks? A. A standard gallon U. S. = 231 cubic inches, and is equivalent to the old English wine gallon. The imperial gallon is not recognized in the United States. It is 277.274 cubic inches.

(12) J. W. S. asks about how many tons of coal the Cunard steamer Umbria consumes per day. A. About 350 tons.

(13) G. W. L. asks: 1. Is there any paint for buoys, so that they can be seen when dark? A. You can try luminous paint. 2. What can I apply to a rope to keep it from rotting? A. Dissolve 1 pound zinc sulphate in 40 gallons of water and then add 1 pound of sal soda. After these ingredients are dissolved, add 2 ounces of tartaric acid. Soak the rope in this solution for 24 hours, and then dry without wringing.

(14) H. P. asks whether a steam horse power is equal to three actual horse power. A. The actual working power of a horse varies ver much. Experiments give from 1/2 to 3/4 of the assigned horse power of 33,000 pounds raised 1 foot per minute as the usual work of horses. Steam engines are counted according to the theoretical horse power, and frequently exceed their rating even on this basis.

(15) W. M. S. asks: 1. How is steam carried between the cars for steam heating? A. By rubber hose, with a coupling made for steam pressure. 2. Does it freeze between the cars? A. No; it would, if not disconnected when not in use.

(16) W. E. G. asks if there is any process by which china and pottery of any description can be cut or sawed without breaking or chipping. A. The process of cutting china and pottery is the same as for glass, which you will find in SCIENTIFIC AMERICAN SUPPLEMENT, No. 318. Use a thin wheel of copper, as illustrated, for sawing.

(17) C. G. B. writes: I have gained many valuable suggestions from your paper, and I thought you might be interested in the way you can make a nice-looking hall lamp out of a tin can, such as you will find in any grocery store; they are used to put up all kinds of spices in, and are made very nice, and just the right size, 12x7. Where the cover comes off, make a band of tin about 2 inches wide. Cut out nicks. Any tinsmith will make you a door in one side for 50 cents, and then cut out each side and put in glass plates such as are used for butter plates or sauce plates. I had a friend who painted mine in imitation of stained glass, and the effect is very beautiful when the light is placed inside. Then I took a round awl or any sharp-pointed instrument, and punched little holes all round in a fancy design, and hung glass pendants on the bottom, and then bronzed the can, and you would not know but what I paid \$12 for my lamp, and all this lamp cost was one dollar and fifty cents and a few hours' work evenings.

(18) W. H. D. asks how to emboss on silk with gold or silver leaf with a warm stamp without staining silk. A. Dust the surface of the silk with finely pulverized gamboge, through a sieve made by stretching the finest cambric over a short tube of paste-

board or tin. Heat the stamp and take up the gold or silver foil and press upon the surface. The silk should lie upon a hard cushion. Afterward dust off the loose powder and leaf with a piece of cotton wool.

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 18, 1887,

AND EACH BEARING THAT DATE.

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

Table listing inventions with names and patent numbers. Includes items like Aerial vessel, Air supply regulator, Animal trap, Animal trap, J. W. Jones, Animal trap, J. S. McKay, Anodyne, S. W. Kincaid, Anti-induction device, J. Curran, Arm pit shields, making, S. Rauh, Atomizer, F. J. Mitchell, Axle box, L. Larsen, Axle nut, C. E. Bertels, Bag, See Mail bag, Bar, See Grate bar, Barrel, E. Putnam, Barrel making machine, F. Andrew, Basins, overflow and stopper for, A. Beffrey, Bed, folding, R. B. Ayres, Bed, spring, G. H. King, Bedstead, J. M. Klein, Bedstead, folding, G. Hunzinger, Bee feeder, M. E. Hastings, Bell wringer, steam, G. B. Snow, Belt shifter, W. H. Price, Jr., Belt shifter, J. Walker, Bicycle, T. W. Feeley, Binder, load, P. Sabourin, Block, See Brake block, Boat knee, D. True, Bob, mechanical, F. M. Gray, Bobbin, A. A. Davis, Boiler, See Water tube boiler, Boiler furnace, I. Howe, Boilers, compound for cleaning, J. Mast, Book, indexed, F. Rosewater, Book, painter's sample, J. H. Parker, Boot, felt, F. M. Fargo, Boots or shoes, insole for, Adams & Barrell, Boots or shoes, lasting, A. F. Smith, Bosom, supplemental, R. Butterworth, Bottles, alarm tag for druggists', E. K. Barker, Box, See Axle box, File box, Fuel box, Match box, Miner's combination box, Brake, See Car brake, Locomotive brake, Brake block, M. Potter, Brush, fountain, C. H. Osborne, Building and bridge construction, P. H. Jackson, Burner, See Lamp burner, Bustle, C. M. Durnill, Bustle, A. L. Rich, Bustle, M. W. Tooker, Button, C. L. Nutting, Button, G. A. Wade, Button attaching machine, I. J. Saunders, Button, safety, T. Regensteiner, Cables, splicing, J. Collins, Cables, joint for lead covered, R. S. Waring, Calendering machines, sheet steaming attachment for, Bond, Jr., & Dakin, Can, See Shipping can, Car brake, L. P. Lawrence, Car brake and starter, C. Forbes, Car brake, automatic, J. S. Sterrett, Car, cable railway, H. W. McNeill, Car coupling, G. Greenwood, Car coupling, L. D. Murphy, Car coupling, S. J. O'Neil, Car coupling, J. Potter et al., Car coupling, R. Steel, Car indicator, railway, J. F. Hughes, Car starter, C. E. Bromwell, Cars, pipe coupling for railway, P. Dufresne, Cars, vacuum brake for railway, L. P. Lawrence, Cargo discharging apparatus, A. Betteley, Carpet stretcher, C. E. Jones, Carpets, producing improved color effects in three-ply ingrain, J. L. Folsom, Carpets, producing improved color effects in two-ply ingrain, J. L. Folsom, Cart, dump, F. H. Evans, Cart, dump, T. J. Flanigan, Cement, apparatus for producing, W. Sonnet, Chain, J. M. Marlin, Chains, testing, W. D. Ewart, Chopper, See Cotton chopper, Chuck, J. Johnston, Clamp, See Rail joint clamp, Rock drill clamp, Rubber dam clamp, Clock, electrical alarm, S. P. Meads, Clutch, friction, J. Macdonald, Coal dump, Jackson & Lytton, Coin bucket, E. R. Whitney, Collars, making apparel, J. H. Young, Combination lock, T. B. Zeller, Commode, baby traveling, W. Morris, Concentrator, hydraulic, F. W. Robinson, Conveyor, spiral, H. Birkholz, Conveyor, spiral, W. C. Marr, Cork fastener, C. Von der Linden, Corset, M. Adler, Cotton chopper, harrow, and cultivator, combined, J. H. Robinson, Coupling, See Car coupling, Hose coupling, Thill coupling, Cracker arranging machine, McClurg & McMaster, Cradle, A. H. Ordway

Table listing inventions with names and patent numbers. Includes items like Cremator or apparatus for burning refuse, J. Hewes, Cultivator, harrow, and seeder, combined, D. Walls, Cultivator, sulky, Rice & Cook, Cultivators, harrow attachment for, O. D. Neisler, Cut-off and strainer, rain water, F. A. Miller, Cutter, See Stalk cutter, Damper, stovepipe, W. G. Mauk, Dental lathe, R. S. Redman, Dish for table use, Sanders & Stamats, Dolls, method of and means for stuffing, W. Flechter, Door check, S. J. Vance, Door securer, O. M. Whitman, Dough raising apparatus, H. H. Parkhill, Dredger, A. K. Stone, Dredging machine, hydraulic, B. C. Howell, Drier, See Fruit drier, Drill, See Ratchet drill, Drilling machine, A. L. Stanford, Dust collector, C. E. Merrill, Dust pan, J. D. McDougal, Electric call or signal apparatus, G. W. Foster, Electric circuit connection, Heffner & Phillips, Electric machines and motors, brush shifter for dynamo, E. H. Amet, Electric meter, R. N. Dyer, Electric wires, conductor for, J. Grant, Electric conductors, means for preventing induction on, S. C. Drew, Electrical indicator, M. Waddell, Electro-magnetic brake apparatus, G. T. Woods, Elevator bucket, J. Chivill, Engine, See Gas engine, Rotary engine, Eraser, slate, J. A. Kienardt, Evaporator, See Fruit evaporator, Excavator, hydraulic, R. H. Elliott, Fence, J. P. Cool, Fertilizer distributor, S. H. Everett, Fertilizer, tank waste, P. B. Rose, File box, A. W. Burr, File, paper, C. A. Campbell, Files, manufacturing double cut, W. M. McDougal, Firearm, breech-loading, Lewis & Lamport, Firearm, revolving, J. M. Marlin, Fire escape, O. H. Holdridge, Fire extinguisher for railway cars, automatic, J. M. Tiernan, Fishing device, automatic, C. McCabe, Flour bolt, H. J. Gilbert, Fodder press, G. H. Clemmer, Forceps, electric, Brannan & Stone, Forging machine, C. Syverson, Foundry apparatus, J. M. Hays, Fowls' throats, instrument for removing worms from, N. Metz, Frame, See Umbrella frame, Wagon frame, Fruit drier, A. J. Hatch, Fruit evaporator, W. S. Plummer, Fruit jar, Heston & Akers, Fuel box, S. G. Smith, Fur or skin drying oven, A. Alstadt, Furnace, See Boiler furnace, Hydrocarbon furnace, Smoke consuming furnace, Furniture leg, W. I. Bunker, Game trap, T. Alexander, Gas engine, Schmid & Beckfeld, Gas in the atmosphere, apparatus for measuring the carbonic acid, A. Wolpert, Gas mains, pipe joint for, Norton & Briggs, Gas mains, pipe joint for, W. H. Richards, Gas plant, Wellman & Goetz, Generator, See Steam generator, Glove or shoe fastener, Fitzpatrick & Jardine, Glue cutting machine, D. Jarves (r), Grate, L. T. Burnham, Grate bar, W. E. Kelly, Grindstones, treadle for, J. H. Simonson, Gun and alarm, burglar, Hancock & Johnson, Gun, breech-loading, W. Gardner, Guns, mounting for quick-firing, R. T. Brankston, Gunstock, A. T. Hibbard, Halter, W. & J. L. Gethmann, Hame and ring therefor, T. S. Alexander, Hame fastener, B. M. Johnson, Hame fastener, T. & F. Staniland, Hame fastener, S. J. Wilson, Hand rest, H. W. Bearce, Hanger, See Picture frame hanger, Harrow, L. W. Stevens, Harrow, spring toothed, L. W. Stevens, Harvester, grain binding, L. Miller, Hay loading machine, M. H. Arnold et al., Head rest, E. T. Brown, Heel stiffeners, machine for forming, E. Andrews, Hinge, telescopic bag stay, C. Reinisch, Hog ring, A. Decker, Hoisting apparatus, dumping mechanism for, W. H. Ewing, Holder, See Horseshoe holder, Photographic plate holder, Sash holder, Shade or globe holder, Tag holder, Telephone holder, Tool holder, Trace holder, Hook, See Picture hook, Snap hook, Horseshoe, A. W. Robertson, Horseshoe holder, J. G. G. Schonthal, Hose coupling, R. F. Gerald, Hub attaching device, A. F. C. Garbin (r), Hydrocarbon furnace, O. D. Orvis, Incrustation, preventing, W. B. Moore, Indicator, See Car indicator, Electrical indicator, Musical transposition indicator, Station indicator, Ingot mould, S. R. Wilson, Ingot for the manufacture of compound metallic tubes, T. S. Very, Inkstand cap, J. A. Stege, Jack, See Wagon jack, Jar, See Fruit jar, Joint, See Railway joint, Key, G. B. Cowles, Keys and key blanks, making, G. B. Cowles, Knit fabric and knitting the same, widened tubular, W. Esty, Knit fabric, widened tubular, W. Esty, Knitting machine, W. Esty, Knitting machines, yarn carrier for, W. Esty, Lamp burner, S. W. Lambertson, Lamp gallery, H. A. Walker, Lamp, oil, A. M. Silber, Lamps, socket and key for incandescent, J. J. Fisher, Lantern, J. W. Murphy, Lantern tops, catch for hinged, F. Kaczeroski, Lasting machine, M. Brock, Latch and lock, combined, E. Hamburger, Latch, refrigerator, W. D. Swart, Life in buried persons, device for indicating, C. Redl, Life preserver, C. B. Morgan