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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 This is for our information and not for publication.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. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. 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.

(7689) J. W. B. asks for the composition of the materials used in making the electro-polishing cloth; it is a cloth filled with something, and is used to polish all kinds of metal, silverware and glass. Also the composition of the magical sponge used for the same purpose. A. Dissolve in 20 ounces of water 4 ounces of soap and gradually add 2 ounces of pumice stone or finely powdered emery. Work this well into coarse cloth with the aid of a sponge. For silverware and glass use jeweler's rouge instead of pumice stone and emery. We are unable to give you any information regarding polishing sponges.

(7690) L. E. T. asks: Why is lightning always visible around the horizon, never being seen directly overhead? A. In answering this question, we should, in the first place, express a doubt of the statement that lightning is never seen directly overhead. It is true that people very rarely look directly overhead; but if they did, we think they would sometimes see the lightning flash across the zenith from one part of a cloud to another part. By far the greater number of lightning flashes are from one cloud to another, and but few from the cloud to the earth. Now to answer the question: It is a fact that most of the lightning flashes are toward the horizon. This is due in general to the fact that the earth around us seems to be a plane and the sky seems to be a dome. A storm cloud moves over the surface of the earth at the same distance above it, disregarding inequalities. When first seen, it is perhaps twenty miles away from the observer in a straight line. It is then seen on the horizon. When the cloud has moved twenty miles, it is directly overhead. It has seemed to rise from the horizon to the zenith, but its actual motion has been along the earth's surface. Its apparent rising is optical, only, and not real. The lightning which plays over the face of the cloud during this time shares the same optical change, and many of the flashes seem to go toward the ground. This appearance of downward motion of the lightning is also an illusion. The passage of a lightning flash is instantaneous, and we in our minds assign a direction to it. It is possible to train one's self to see the flash go up from the earth to the cloud. Prof. Snell, of Amherst, used to say to his students that he always saw the lightning flash up from the earth to the cloud. Another effect of projecting the motion of the cloud, which is nearly horizontal, against the concave dome of the sky is to cause the apparent velocity of the storm to increase very rapidly as it comes near us. The cloud seems to rise very slowly at first and to move much more rapidly as it comes over our heads. A gathering storm may increase its velocity of progression, but a thunderstorm which may travel several hundred miles before it uses up its force, is visible above any one horizon for a small portion of its course. Its actual motion, therefore, is quite uniform. Its acceleration is due to the fact that it is much nearer to the observer when it is nearly, or quite, over his head.

(7691) W. S. L. writes: 1. Have read your description of the Jeanty battery. 1. What voltage will each cell give and what amperage on short circuit? How many cells will be required to charge storage battery? A. We have no knowledge of the Jeanty cell beyond what is contained in the SUPPLEMENT, No. 1225, translated from the French journal Cosmos. It is however a gravity cell, and will give an E. M. F. of a little over one volt. Its amperes will vary with the total area of the zinc and copper plates used and the distance between them. This cell can be used for any purpose for

which the gravity cell can be used. In charging storage cells, five of these cells will be required for each two storage cells. We do not know whether these cells have been introduced into the United States or not. 2. How many cells of storage battery and what size for one, two, and three ten candle power lamps? A. Ten candle power lamps are made for a great many different voltages. To light any lamp by a storage battery, take half as many cells as the voltage of the lamp. The size of the cell determines the ampere hours it will give, that is, the length of time it will light the lamps. Without knowing what current the lamps use, we cannot tell the number of cells required.

(7692) F. A. W. writes: I would like to ask a few questions in regard to the primary battery Jeanty that you illustrate in issue of June 24, 1899. What is the E. M. F. of battery? Are they made in different sizes? If so, what is the size and weight of cells of different capacity? I am looking for a primary that I can operate a lamp for a stereopticon outfit. Can this cell be used successfully to charge storage battery? A. See answer to last query. You will require about fifty of these cells to light an arc lamp for a stereopticon. It is of course possible to use a battery for a stereopticon, but it is an expensive mode of getting light, both in labor and materials. Where the current for incandescent lighting cannot be had, there is no better light for a stereopticon than the calcium light. Many prefer it for its softness, even when the electric light can be had.

(7693) C. B. M. writes: In experimenting with electric detonators for blasting, etc., I wish to procure some data regarding same, such as resistance of platinum wire, heat generated, amount of current required, etc. A. The construction of an exploder with which to set gunpowder on fire is not difficult. Take two pieces of rather coarse copper wire, No. 14 or 16 will answer, and join the ends with a piece of rather fine platinum wire, No. 28 or 28 will answer. The platinum and copper wires should be joined by twisting rather than by soldering, and not more than a quarter of an inch of free platinum wire is needed between the copper wires. The other ends of the copper wires are to be joined to the battery. The platinum wire is buried in the powder to be ignited. When the circuit is closed, the electric current heats the platinum wire to redness, and this sets the powder on fire. A couple of cells of dry battery should be sufficient. The resistance of platinum, is nearly 5 1/2 times that of copper, size for size.

(7694) W. F. D. asks: 1. Is there any known substance (or substances) through which electricity cannot pass? If so, please name them? A. Any insulator fulfills the requirement of this question. There are many of these. Those in common use are glass, mica, porcelain, slate, India rubber, gutta percha, vulcanized fiber, paraffine, paraffine oil, and various other oils, both of animal and vegetable origin. These are all high insulators. 2. What is the most economical method of producing it for experimental purposes? A. There is no single substance of the character referred to. Each of the substances we have named above has its own process of manufacture. 3. What is the latest theory concerning the above? A. A substance which offers high a resistance to the passage of an electric current that practically no electricity can pass through it, is called a non-conductor, and may be used for insulation.

(7695) W. P. C. asks: What length of spark must an induction coil give to successfully operate an X-ray tube? A. Coils giving a spark of an inch or even less in length have been used to produce X-ray pictures. This is due to the fact that the effect of the rays upon the plate is cumulative, and by prolonging the exposure a picture can be made with a small tube and small coil. A small coil will not operate a large tube to advantage. For successful work in penetrating the thicker portions of the body, a coil giving a spark of even fourteen inches is used.

(7696) J. T. M. asks: Will you oblige me by giving me the address of some house which can furnish all necessary material for making the electric motor which is described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 641? How can this machine be made to produce an electric light, if at all? A. The machine described in SUPPLEMENT, No. 641, was designed for a motor. If power is applied to it and it is turned at full speed, it may produce current as a dynamo, and it may not. Many little machines will not excite their own fields. You can use a battery to excite the field. It then will generate a current and will probably light a miniature lamp. For dealers in materials see our advertising columns.

(7697) G. B. O. asks: Will two equal waves of light or sound, coming from opposite directions and meeting each other, cause darkness, or stillness, respectively? A. If two waves of any sort meet each other in opposite phases, as, for instance, the crest of one falling into the trough of the other, these waves will destroy each other. This is called the interference of waves. It may be observed in water, and produced in sound, light, and electric waves. See any text book of physics.

(7698) M. R. M. asks: The way to find the magnifying power of a telescope, field and opera glass, and, so doing, your kindness will be thoroughly appreciated. A. For the magnifying power of telescopes, divide the focal length of the object glass in inches by the focal length of the eye piece in inches, if a single lens. With Huygenian, Ramsden, or terrestrial eye pieces, the method of obtaining the magnifying power is illustrated, with the forms and combination of the lenses, with the rules, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 399, 10 cents mailed. The magnifying power of an opera glass is best obtained by comparison of one of the pairs of glasses by direct vision of the other eye on a well defined object.

(7699) G. M. asks: Will you kindly inform me whether the armature can be wrapped with eleven coils instead of twelve in the simple electric motor described in SUPPLEMENT, 641? A. You need not re-wind your armature because you have room for but eleven coils instead of twelve as designed. Make a commutator with eleven bars, the same as the number of coils, and proceed in other respects according to the directions in SUPPLEMENT, No. 641.

TO INVENTORS. An experience of fifty 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, 631 Broadway, New York.

INDEX OF INVENTIONS For which Letters Patent of the United States were Issued for the Week Ending JULY 11, 1899, AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing inventions with patent numbers and names of inventors. Includes items like Accumulators, Acids of aliphatic cresotesters, Addressing machine, Agricultural implement, Air coupling hanger, Alarm, Amalgamator, Anesthetic, local, G. Pertsch, Anesthetics, device for administering, R. E. Mercer, Annular trap, J. Morgan, Bag, See Feed bag, Baling press, P. K. Dederick, Barrel closure, F. Kohn, Battery, See Galvanic battery, Primary battery, Secondary battery, Bear trap, R. S. Lawson, Bed bottom, J. E. Sommers, Belt, C. C. Weeks, Belt, knitted driving, M. Koch, Bench, See Wash bench, Bicycle, M. Pedersen, Bicycle, H. H. Leach, Bicycle cushion attachment, W. B. Spencer, Bicycle gear, J. N. Newsum, Bicycle handle bar, F. Schrader, Bicycle saddle, W. C. Gates, Bicycle support, B. Phelan, Bicycle, etc., frame for, J. A. McKee, Binding machine, shifting device for self, W. B. Brown, Biscuits, manufacturing, W. T. Carr, Boiler, See Range boiler, Book, account, J. Prudenfeld, Book, machine, W. W. Johnson, Bottle, non-refillable, F. W. King, Box, See Folding box, Folding or collapsible box, Hat box, Packing box, Box, J. H. Greenstreet, Brake, See Car brake, Sleigh brake, Bread, machine, W. W. Johnson, Bread, preserving, H. A. Sevigne, Brick, W. M. Hazel, Brick sanding and forming machine, Converse & Underwood, Broom, push, J. Knecht, Buckle, harness, E. Manes, Bung, G. F. Bokel, Buoy, C. B. Wetterbergh, Burner, See Gas burner, Hydrocarbon burner, Cabinet, bill or envelop, F. Schilz, Cable roads, automatic grip for, J. Heenan, Cane, hand, producing, W. S. Horry, Cane carrier and feeder, D. H. Walsh, Cane knife, H. Disston, Cap, I. Pachner, Capsuling food extracts, C. R. Valentine, Car brake, L. Logan, Car brake, Rodgers, C. H. Cunningham, Car coupling, J. E. Cunningham, Car frame, F. E. Canda, Car wheel, F. E. Canda, Cars, electric lighting apparatus for, C. A. Gould, Cars, electric lighting apparatus for, J. L. Creveling, Carburizer, W. Stetson, Card flat end clip, Mills & Hutton, Card lock rod, D. E. Hunter, Card punching machine punch selector, M. W. Lee, Case for sacrocaudal articles, J. J. Eugster, Casket head rest, T. W. Coughlin, Casket pedestal, J. Ort, Casting metallic wheels, apparatus for, C. Bush, Ceiling and side wall plate, metal, G. H. Ennis, Chain, Camel and Tailandier, Chair and cane, combined, Kutz & Kelchner, Chopper, See Cotton or beet chopper, Chronometer escapement, A. V. Chardon, Cigar bunch roller machine, R. M. Russell, Cigar vending apparatus, C. Fisher, Circuit breaker, automatic, C. M. Clark, Clamp, W. H. Sheeley, Cleaner, See Carpet cleaner, Flue cleaner, Stovepipe cleaner, Window cleaner, Clock, program, E. H. Schild, Clothes line prop, W. F. Briggs, Clothes wringer, G. Paddock, Coal handling apparatus, W. H. Wall, Cock, compression, J. H. Calahan, Coffee pot, Goldsmith & Martyn, Coin delivery and cash register machine, E. J. Brand, Collodion nature, Heising & Pertsch, Column, wooden, Schwerd & Enrick, Compass and course corrector, J. M. Fields, Compressed air mechanism for vehicles, F. Schumacher, Computing device and weighing scale, combined, H. H. Stephens, Computing device, tax, W. F. Parker, Concentrating and amalgamating machine, Coulis & Dohlgreen, Conveyer slide block, J. M. Dodge, Cooking apparatus, electrical, J. B. Cary, Cores, making press, L. D. Craig, Copying press, F. J. Dyer, Corn knife, E. D. Woods, Corrugating machine, C. Traxler, Cotton elevator, C. McIntosh, Cotton or beet chopper, G. W. Rice, Coupling, See Car coupling, Hose coupling, Spring coupling, Stovepipe coupling, Thill coupling, Crane, overhead traveling, T. R. & W. H. Morgan, Crate, folding, Taylor & Moore, Cream separator, centrifugal, E. G. N. Salenius, Cucumber picker, W. W. Robinson, Culinary utensil, Longfield & Kline, Cultivar, D. S. Blue, Cultivator, M. & A. Sattley, Cultivator, corn, E. Nordstrom, Cultivator draught connection, wheeled, E. Children, Cupboard and dumbwaiter, combined cellar, G. W. Mentzer, Curling iron, hair, B. Gray, Currents in conduits, pipes, etc., means for regulating, B. H. Goll, Cutter, See Paper cutter, Shade cutter, Vegetable cutter, Cutter bar, M. Viskoehil, Cutter head, C. F. Overmyer, Cutting stick and retaining device therefor, A. Houghton, Cycle, chainless, A. W. Delane, Cycle driving mechanism, Lane & Doney, Cycle, motor car, or other frames, etc., junction of, Kirk & Jeffs, Dental dam attachment, M. O. Nelson, Dental plunger, Case & Shaw, Dentist's or jeweler's drawer and tray, T. C. Howcroft, Derrick, C. W. Kearns,

Table listing inventions with patent numbers and names of inventors. Includes items like Derrick, E. F. Terry, Desk attachment, W. R. Rathvon, Die, See Embossing die, Die press, W. E. Hewit, Digger, See Potato digger, Display, cabinet, ribbon or braid, W. H. Wyman, Door, cabinet, Harkness, Door fastener, O. E. Wold, Door hanger, sliding, A. Doolan, Doors in partially open positions, device for securing, S. K. Humphrey, Douche mat, M. M. Hawley, Draught attachment, J. M. Carter, Drill, See Rock drill, Drill, Farrington & Copeland, Drilling, boring, or shaping machine, W. Fletcher, Dye and making same, blue black, C. O. Muller, Dye, black, Friebs & Kaltwasser, Dye, bluish black, Friebs & Kaltwasser, Dye, brown azo, P. Julius, Eggs, device for beating, C. Julier, Electric conductors, manufacture of, S. O. Cowper-Coles, Electric current regulator, F. E. Ramsay, Electric current transformer, S. K. Humphrey, Electric currents at sea by the action of waves, device for producing, M. Gebre, Electric furnace, J. J. Faulkner, Electrode, battery, J. C. Howell, Elevator, See Cotton elevator, Elevator alarm electric, H. R. Bruhns, Embossing die for burnishing rolls, E. H. Wilkinson, Engine, See Gas engine, Rotary engine, Steam engine, Engine cut off, locomotive, M. Wilkes, Engine, light, gas, C. O. Parison, Eraser cleaning machine, J. L. Smith, Etching cylindrical surfaces, H. Lyon, Extractor, See Ingot extractor, Fabric, See Textile fabric, Fan attachment, W. R. Blevins, Fasteners, stud member for separable, G. E. Adams, Faucet, C. S. Frishmuth, Feed bag, E. Dawson, Feeding and weighing machine, P. C. Waring, Fence, wire, G. H. Chandler, Fence, wire, G. H. Chandler, Fencing machine, reeling mechanism, J. A. Jewell, Filter, W. M. Deutsch, Filter, water, Bliss & Richmond, Filtering beer, etc., apparatus for, C. Haefner, Fire escape, J. Maier, Fire escape, J. E. Young, Fire escape and truck ladder, J. F. Mack, Fire kindler, J. F. Murphy, Fireplace, C. B. Fay, Fishing reel, D. M. Charles, Jr., Flexible joint, A. Campbell, Flexible material, machine for making articles of, Shedlock & Hudson, Flexible material or articles formed therefrom, apparatus for setting or curling, Shedlock & Hudson, Fluid actuated motor for actuating fluid, T. O. Perry, Fly paper holder, J. W. Schriever, Folding box, R. A. Kneeland, Folding machine, N. Hayward, Folding or board grip, J. H. Chenoweth, Folding table, J. W. Hoshour, Formaldehyde solution, J. A. TriMat, Fruit grader, dipper, and spreader, F. M. Starrett, Furnace, See Electric furnace, Furnace, light, gas, C. O. Parison, Furnace spark arrester and draught producer, A. Brecht, Furnace wall cooling device, Gaines & Gustafson, Furnaces, air feeding apparatus for boiler, W. Kuen, Furnace, composition of matter for cleaning and polishing, O. P. Macklin, Galvanic battery, W. Rowbotham, Game, H. A. Davis, Game apparatus, Cosner & Mathews, Gas apparatus, acetylene, A. A. Strom, Gas burner, J. O. Gue, Gas burner, M. Strakosch, Gas engine, C. W. Bogart, Gas generator, acetylene, J. Harris et al., Gas holder, A. A. Strom, Gas main bag, G. W. Schultz, Generator, See Gas generator, Steam generator, Glass block, hollow, A. Lasch, Glass, metal joint for window, H. W. Rudolf, Glove fastener, A. F. & E. Hall, Governor, steam engine, Skinner, Grader, ditch, J. J. Helling, Graphophone recording styles, machine for making, T. H. MacDonald, Grinding machine, J. Gilson, Grindstone, G. W. Jones, Guns on board ship, means for use in working, quick firing, J. A. Normand et al., Hair fastener, A. L. Bates, Hair pin, D. W. Irvin, Hair trimming device, M. McCarter, Hammer, steam, J. F. Doolittle, Hand files, S. J. Odenusch, Harmonica, F. Strauss, Harness attachment, G. E. Pooler, Harness collar supporter, W. N. Houghtaling, Harrow, R. J. Chenoweth, Harrow, L. J. Schumacher, Hat box, pyramidal, M. L. Horning, Hat holding attachment for chairs, F. R. Ottenheimer, Hat making machine, P. C. Waring, Hat support for theater seats, E. J. Guenzel, Heat, See Heating chamber, Heater, Heel compressing machine, W. J. Young, Hoisting apparatus, T. Shipley, Hominy mill, J. Beall, Hook and eye, D. L. M. McIntyre, Hook and eye, B. W. Mcwiler, Hook and eye, J. W. Pistone, Horseshoe, W. E. Shaw, Hose coupling, J. Collette, Hose nozzle, M. H. Hart, Hot air heater, electrical, J. A. Elliott, Hub for wheels of velocipedes, etc., E. Germain, Hub, wheel, R. F. A. MacKinnon, Hydrocarbon burner, C. M. Gray, Hydrocarbon burner, J. A. Mason, Incandescent mantle and making same, F. Fritz, Incandescent mantles, apparatus for trimming, Welsch & Barrow, Indicator, Vandegriff & Webb, Ingot extractor, J. Kennedy, Injector, A. Fuller, Injector, E. J. Young, Ink well, S. H. Nixon, Inner sole, J. S. Darnell, Insulated rail support, King & Mead, Insulation of electric wires, J. A. Poche (re-issue), Jack, See Lifting jack, Jar cover or closure, W. S. 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Pierce, Lubricator choke valve feed, Weldon & Egger, Mail distributing boxes, partition for, Myers & Rinehart, Manure loader, automatic, W. Bell, Mask, base ball, B. T. Rogers, Mat, See Douche mat, Measure, C. L. Fulton, Measure, tape, B. H. Kirk, Measuring air currents, etc., apparatus for, H. Kuhne, Meat securing device, J. Patterson, Meat tree, J. J. Fitzgerald,

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