

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 This is for our information and not for publication.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.

(8125) C. D. M. writes: The sparking coil for my power boat is 9 inches long and wound with No. 12 wire. As it is supplied with two sets of small "Mesco" dry batteries of six each, and liable to "skip," I am of the opinion that I should either have more volume of current to saturate the coil or have the same wound with small wire to get the best results.

(8126) E. A. S. asks: 1. How high a frequency of explosion could reasonably be attained in a small gas engine, ignition to be by electric spark and the amount of gas small? A. There is a possibility of 1,200 explosions per minute in a 4-cycle engine giving 2,400 revolutions per minute.

(8127) J. M. F. asks: 1. Will you please answer me in your notes in the SCIENTIFIC AMERICAN if the motor Mr. Hopkins describes in the paper of December 8 and 15 can be run by a direct current of 110 volts? A. The little motor described in our issues of December 8 and 15 cannot be run by a current of 110 volts pressure.

(8128) F. F. asks: 1. Can you tell me how to join a transmitter and receiver on an extension bell so that every time the phone rang it would not be necessary to go to it, but be answered at the extension bell end? A. The extension bell, transmitter and receiver form a complete set in themselves. They should be set up at the place wanted and regularly connected to the line.

(8129) F. W. F. writes: I have a 110-volt alternating lighting circuit. I wish to use a motor that, in turn, will drive a dynamo of fifty 16-candle power lights, giving direct current of at least 110 volts. What horse power motor must I use? A. Six horse power in the motor should do the work, if the current is not to be carried to a distance.

(8130) O. H. B. asks: 1. Would wire No. 17, A. W. G., do for winding the field magnet of the motor illustrated on page 498 of "Experimental Science," the edition of 1890? A. Yes. 2. Why is not copper or steel used instead of platinum for the connection on a circuit breaker of an induction coil? A. Platinum neither melts nor oxidizes.

be better, say No. 24. Three hundred to four hundred feet will answer. 4. What is the principle on which a naphtha engine runs? A. The vapor of the naphtha, mixed with air, is exploded in the engine, and the pressure due to the explosion drives the engine.

(8131) R. C. F. asks: Will you kindly discuss, briefly, the time element in wireless telegraphy? By this may be meant how, if it be a form of sympathetic vibration, it is related, in the above particular, to the action of tuning forks or strings of the same pitch. Are we obliged on theory, as yet, to attach instantaneousness to it, as in the case of the action of gravitation? Is this same instantaneousness attachable also to the action of two magnets? Or are all these actions to be considered as motions through a medium, though not as yet measurable like that of light and electricity? A. The waves in wireless telegraphy are electro-magnetic waves, sent off from the wire of the transmitter and received upon the wire of the receiver.

(8132) C. T. J. asks: Will telegraph instruments of different ohms resistance work together without using relays? If not, why? Please explain fully. A. If there is any considerable difference in the resistance of the receivers they will not work well in series on the same line. The current which will magnetize one will not be sufficient to magnetize another with fewer turns on its coil. The best arrangement is to use a local circuit at each station, as is done on regular lines. Then each receiver answers to its own battery, while the relays wound to the same resistance work the line.

(8133) C. A. M. writes: I want a book on electricity, one that gives the tables, per foot, in pounds, of different sized wire; also resistance in ohms of different sized wire, per foot or pound. A. The data for wire are to be found in "Arithmetic of Electricity," by Sloane, price \$1, by mail.

(8134) T. E. P. asks: How much water per minute will run through 1,200 feet 5-8-inch horizontal pipe, under fifty feet head? A. Three gallons per minute.

(8135) M. L. L. asks: In order to settle a dispute, and due to the fact that the books of reference we have consulted do not contain the absolute facts, will you kindly advise whether the oxidizing of lead, tin and zinc produces more weight in oxide than the original metals weighed at the start? This, with the presumption that nothing else but heat is used for the purpose of making the oxides. We would also appreciate it very much if you can give us the exact increase, if any, that there is in weight by the making of oxides of these metals. A. Whatever weight of oxygen is used to convert the metal into an oxide is added to the weight of the metal when the whole is converted. Lead oxide is PbO. The combining weight of lead is 207; of oxygen, 16. Therefore, 207 ounces of lead will use 16 ounces of oxygen, and the lead oxide will weigh 223 ounces. Proceed in the same manner for all the other oxides. The combining weight of tin is 118, and of zinc is 65. The oxides of lead are PbO, Pb2O, and SnO2. Zinc oxide is ZnO.

(8136) W. E. D. asks: Have you any SUPPLEMENTS describing the construction of a small hand camera, about 5 inches x 6 inches? What would be the cost of materials for such a camera? A. SUPPLEMENTS 826 and 1021, price 10 cents each, describe cameras. SUPPLEMENT 625 describes the manner of making a bellows. The cost of material is very little, except for the lens, and the lens may cost all you care to put into it. As good a lens should be bought as can be afforded.

(8137) B. I. T. and others have heard the belt question argued for a quarter of a century—which side of a leather belt should run next the pulley, the grain or the flesh side. A. The grain side on the pulley is the most efficient, but appearance seems to have established the practice otherwise.

(8138) W. T. asks: Will you please let me know what material (I believe copper will not do) can be used in construction of an acetylene gas generator? Can rubber be used in joints of valves, etc? A. Tin will answer the purpose. Rubber or leather will answer for valves.

(8139) J. F. S. writes: In experimenting in the mixture of colored light produced by transmitting light through colored glass, I find that, using Helde's colored jubes, green + orange = yellow; green + violet = blue; orange + violet = red; but, using colored glass instead of jubes, the mixtures are like those of pigments. Why are not the results the same in both cases? A. The results are not the same because the lights used are not the same in the two experiments. To test the lights, we must pass them through a spectroscope. The eye cannot tell. Two lights which look the same to the eye are found to be very unlike when submitted to the analysis of a prism. Your experiments with the lights are by means of absorption. When one glass has taken all it can out of the light, you pass the rest through another glass. That absorbs

what it can of the remainder, and you call that a mixing of colors. It is not a mixing of colors at all. If you would mix colors, place them so that the light from each shall combine in the eye, and observe the result. See Rood's "Modern Chromatics," price \$2, by mail.

(8140) M. C. O'C. asks: Which is the best battery to use for medical purposes—dry cell or wet cell? Have you any book teaching a person how to use and apply it? A. A dry cell will work a medical cell as well as a wet cell. We can furnish you Bartholow's "Practical Treatise on Electricity in Its Application to Medicine," price \$2.50 by mail. We must say that it is not safe to use electricity except under the advice of a competent physician, if one can be had. Your case may be an exception.

(8141) A. B. W. asks: Will you inform me the best kind of paper to use for the field plates of the Toepler-Holtz and similar machines? I understand they are sometimes put on the glass with shellac varnish, but should suppose this would be non-conducting when dry. Would not glue be better, which naturally absorbs some moisture from the air, especially when it is damp? A. It does not matter much what is used to fasten the paper disks to the glass plates of the Holtz machines, except that it must be something which will not gather moisture, but remain perfectly dry. Every part of this machine must be dry. Shellac is very good for the purpose. The paper is a non-conductor, and is intended to be so. The strips of tinfoil under the paper serve to connect with the brushes so that the charge produced by the brushes is carried over to act inductively on the plate.

(8142) J. F. C. asks: Please tell me if the relay used on the ocean cable is the same as that used on the common telegraph? If its object is to strengthen the current, would it add more power (however little) to a strong current produced by a generator? If not, why not? Could anything do so? A. A relay does not add anything to the current flowing through it. It cannot strengthen it in any way. It is a circuit closer for a local circuit, and acts as a switch to cut in the local battery and work the instruments by that current and not by the current which works the relay. An arrangement for strengthening a current is used to make up lost volts in a line for lights and power, and is called a "booster." It is a separate generator at a voltage which replaces the loss to the line.

INDEX OF INVENTIONS For which Letters Patent of the United States were Issued for the Week Ending MARCH 12, 1901, AND EACH BEARING THAT DATE.

Table listing various inventions with their corresponding patent numbers, such as Air compressing or blowing machine, G. B. Petsche, 669,853; Albums, etc., support for, G. Schwab, 669,903; Alining and leveling device, J. V. Hulse, 669,526, 669,527; Amalgamating machine for extracting gold from sand in place, hydraulic, G. S. Bartholomew, 669,911; Amalgamator, gravity, J. Tobin, 669,671; Bag holder, N. E. Pierce, 669,660; Bailing press, A. L. Treese, 669,948; Basket, H. J. Sitterly, 669,768; Battery, See Primary battery; Bean hulls, means for removing, C. D. Fuller, 669,727; Beans, preparing, C. D. Fuller, 669,725; Bearing, shaft, T. Miller, 669,540; Bearing, thrust, F. P. Snow, 669,601; Bed pan, M. MacAdam, 669,756; Bicycle, C. L. Horack, 669,833; Bicycle, J. G. Moomy, 669,945; Bicycle gear driving mechanism, J. G. Moomy, 669,652; Bicycle gearing, C. Ganz, 669,879; Bicycle luggage carrier, W. J. Bray, 669,677; Bicycle seat, C. Bicker, 669,676; Bicycle support, E. Miller, 669,538; Binder, temporary, J. F. Cordes, 669,778; Board, See Shovelboard; Boiler cleaner, C. S. Garrigus, 669,746; Boiler furnace, E. J. Schmidt, 669,666; Boiler incrustations, composition for removing, G. Kobes, 669,930; Boilers, means for the prevention of incrustation in, J. Gottlob, 669,922; Bolt, See Door bolt; Bookbinder's type pallet, E. L. Frank, 669,629; Book, copy, G. L. Hodges, 669,525; Book holder, R. P. Hackworth, 669,522; Bookholder bracket, adjustable swivel swing, W. J. Walsh, 669,935; Boot or shoe calks, machine for setting, C. Johnston, 669,835; Bottling machine attachment, T. G. Penske, 669,917; Brake, See Car brake; Brake shaft coupling, M. Potter, 669,805; Brick mold, S. A. Winchester, 669,885; Bricks, etc., apparatus for use in the manufacture of, J. Hall, 669,830; Brooder, O. W. Randolph, 669,856; Brush making machine, F. J. Le Due, 669,754; Bucket support, J. Lowe, 669,533; Buff wheel attachment, J. H. Green, 669,833; Building construction, wooden, F. C. Penny, 669,591; Cabinet, bin, O. R. Smith, 669,736; Cabinet, kitchen, C. A. Post, 669,961; Cable clip, B. Hurd, 669,795; Calculating machine, H. Goldman, 669,969; Calendar, W. Leigh, 669,959; Calendar, A. A. Sparks, 669,811; Canada thistles, composition for killing, Eisch & Racinski, 669,725; Candy dropping machine, J. Smith, 669,769; Candy shaping and cutting apparatus, P. A. Sterne, 669,905; Canopy support, W. P. Biddle, 669,740; Car, box, G. I. King, 669,797; Car brake, I. H. Giles, 669,781; Car, convertible freight, O. B. Critchlow, 669,876; Car coupling, automatic, A. Heron, 669,747; Car, hopper bottom, G. I. King, 669,738; Car loading device, railway, W. P. Porter, 669,854; Cars, flush drop door for freight, L. T. Canfield, 669,722; Carpet sweeper, J. F. Hardy, 669,690; Cartridge shell wind factory, Place & Peters, Case, See Chart case; Casting apparatus, metal, J. B. F. Herreshoff, 669,696

Table listing various inventions with their corresponding patent numbers, such as Casting mold, steel, W. Brinton, 669,952; Celery digger, A. Bohlen, 669,893; Channel clearer, F. Christen, 669,820; Chart case and paper weight, combined, J. H. Carver, 669,682; Chlorates, making, J. Hargreaves, 669,637; Cigarettes, machine for making all tobacco, A. H. Randall, Jr., 669,548; Clock, program, C. L. Hayes, 669,581; Clothes pin, W. A. Simons, 669,863; Clutch, friction, C. O. Carlson, 669,051; Cock, gage, H. Harris, 669,880; Cock, stop and waste, S. J. Asbell, 669,817; Cock, stop and waste, D. E. Trahern, 669,815; Collapsible carrier, C. Grant, Jr., 669,829; Collar fastener, H. C. Loudermilch, 669,931; Controller, C. F. Lundberg, 669,755; Cooling vessel, F. W. Berk, 669,514; Copy holder, Farish & Dawes, 669,745; Corn header, Kafir, R. B. Franklin, 669,688; Corn husking machine husking trough, H. L. Ferris, 669,687; Corn sheller feeder, L. O. Whittemore, 669,718; Cotton gin feeder, C. W. Brown, 669,720; Crank mechanism, J. C. Moore, 669,542; Crate, folding, S. B. Gillette, 669,631; Crate, knockdown, J. Heagerty, 669,728; Crucible, C. R. Shine, 669,862; Cuff holder, R. J. Gunson, 669,636; Cup, See Shaving cup; Current wheel, E. Peterson, 669,852; Curtain or shade, window, S. B. Solomon, 669,967; Curtain pole, J. A. Beam, 669,776; Cutter, T. M. Simpson, 669,555; Cutting off tool, Birchard & Campbell, 669,874; Cycle inflators, clip for attaching, W. G. Hurst, 669,697; Despatch apparatus, tular, W. A. H. Bogardus, 669,886; Despatch systems, carrier for tubular, W. A. H. Bogardus, 669,890; Digger, See Celery digger; Display card supporting bracket, H. C. Cady, 669,680; Distillers' wash, treating, Sudre & Thierry, 669,812; Distilling apparatus, water, D. L. Rose, 669,966; Ditching machine, Merzstehner & Edson, 669,799; Door bolt, rack and pinion, H. G. Voight, 669,715; Door check, S. W. Poregrine, 669,762; Door equalizing device, Wernicke & Tobey, 669,907; Dovetailing machine, J. E. Erickson, 669,686; Draft rigging, G. S. Marshall, 669,843; Draft rigging, J. Timms, 669,713; Drawer, cash, J. Ohmen, 669,849; Drill guiding appliance, M. Potter, 669,764; Eye of naphtha series and making same, blue, R. Bohm, 669,894; Dynamo, Parsons & Stoney, 669,803; Dynamometer, J. B. Webb, 669,668; Educational appliance, S. Furdek, 669,878; Ejector, automatic fluopneumatic, H. S. Blackmore, 669,572; Electric appliances to the human body, device for adjusting, J. Charles, 669,619; Electric current rectifier, Gilbert & Wheeler, 669,940; Electric currents, system for generating and distributing, Gilbert & Wheeler, 669,942; Electric machine, dynamo, A. R. Bliss, 669,573; Electric machine, dynamo, D. M. Bliss, 669,574; Electric machine or electric motor, dynamo, N. C. Bassett, 669,613; Electric motor, C. Milde, 669,759; Electric motor casing, C. A. Beck, 669,577; Electric printing system, B. P. Panton, 669,590; Electric switch, Gilbert & Wheeler, 669,941; Electric switch, T. G. Meinema, 669,536; Electric switch, W. F. Richards, 669,706; Electrical connection binding post, A. Fischer, 669,517; Electrical controller, C. R. Reynolds, 669,595; Electrical device for converting alternating currents, A. Nodon, 669,802; Electrolytic apparatus, P. W. Knauf, 669,752; Elevator, See Inclined elevator; Elevator and conveyor, E. C. Berghofer, 669,571; Elevator door lock, A. M. Coyle, 669,622; Embroidery hoop, C. C. Edwards, 669,915; Enameling surfaces of refractory materials, apparatus for, C. H. Waterman, 669,567; End gate, wagon, H. Leon, 669,532; Endless adjustable screen, W. Collier, 669,508; Engine, W. R. Fleming, 669,518; Engine, E. Y. Moore, 669,588; Ewener, four horse, Parker & Beauregard, 669,851; Exercising and developing the fingers, apparatus for, J. Morat, 669,846; Fabric having metallic teeth or wires secured therein, A. L. Cudey, 669,509; Fan handle, J. H. Linesch, 669,648; Feed regulator for steam boilers, automatic water, C. A. Anderson, 669,611; Feed water heater, W. A. Gibson, 669,921; Feed water heater, E. Smith, 669,667; Fence machine, slat and wire, E. W. Channell, 669,953; Fence post, C. I. Huxley, 669,643; Fence post making machine, T. A. Beem, 669,705; File, L. C. McNeal, 669,671; File, bill, C. C. Boykin, 669,503; File, document, E. A. Shapp, 669,598; Firearm magazine, F. Portelka, 669,919; Firearm, magazine, F. Portelka, 669,918; Fire escape, G. Oslund, 669,656; Fire lighter, J. M. Leek, 669,531; Fireplaces, air heating and distributing apparatus for open, E. F. Crowthier, 669,912; Fireproof flooring, J. A. McNamee, 669,801; Fish, means for transportation of, H. B. Joyce, 669,751; Folding hanging rack, L. Tenney, 669,561; Food preparations and preserving same, P. G. Richter, 669,868; Food stuffs, apparatus for storing, cooling, and handling, J. J. Stauffer, 669,603; Fuel preparing and feeding apparatus, A. A. Day, 669,897; Furnaces, water cooled bosh for blast, A. Sablin, 669,859; Game, B. D. Bon, 669,826; Game, E. E. Leigh, 669,943; Game apparatus, J. G. Floyd, 669,826; Game, magnetic, J. R. Davis, 669,723; Game, quilt, G. H. Buttery, 669,617; Garbage furnace, F. Gorman, 669,632; Garment supporter, H. A. Guinzburg, 669,635; Gas apparatus, acetylene, W. W. Camp, 669,741; Gas engine, E. Thomson, 669,737; Gas enriching, R. L. Middleton, 669,650; Gas enriching apparatus, R. L. Middleton, 669,651; Gas furnace, E. P. Reichhelm, 669,765; Gas generator, acetylene, J. F. Ford, 669,938; Gas igniter, electric, O. von Morstein, 669,433; Gas separator for digesters, N. C. Hodgkins, 669,958; Gate, carrier, S. E. Staddon, 669,602; Gear, driving and reversing, C. R. Greuter, 669,924; Gear, speed, S. M. Wadsworth, 669,867; Glass blowing machine, H. W. Heardt, 669,524; Gold dry washing machine, L. D. Hubbard, 669,928; Gold saving machine, T. Bell, 669,873; Golf club, A. Simpson, 669,864; Governor, engine, G. Hepburn et al., 669,694; Grabot cleaner, R. Derdeyn, 669,821; Grain and fodder shocker, W. B. Tyler, 669,563; Graphophone sound box support, C. Burkhardt, 669,895; Grinder, Mayer & King, 669,932; Grinding and polishing device, E. Grauert, 669,923; Gun carriage traverse indicator, A. H. Emery, 669,898; Gun stock, adjustable, J. N. Zoeller, 669,871; Guns, apparatus for supplying ammunition to turret or barrette, Dawson & Horne, 669,699; Hame hook, D. Jackson, 669,639; Hammer, pneumatic, C. H. Shaw, 669,579; Harrow and roller, combined, L. D. Butler, 669,679; Harvester, peanut, G. W. Williams, 669,908; Hat fastener, G. E. Moore, 669,541; Heater, See Feed water heater; Hook, See Hame hook, Whiffletree hook; Hook and eye, E. P. Evans, 669,515; Hook and eye, R. W. Groves, 669,782; Hoop, See Embroidery hoop; Horseshoeing rack, C. G. McElroy, 669,847; Hose coupling, steam, J. F. McElroy, 669,960; Hose nozzle, J. H. Melavin, 669,845; Hosiery, manufacture of seamless, E. E. Kilbourn, 669,530; Hub and axle, motor vehicle, A. Krastin, 669,585; Hulling machine, C. S. Rider, 669,735

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