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Notes & Queries

MINIS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer. Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) G. E. asks: Can I cast a zinc plate 8 x 8 in., 1/8 in. thick, in a plaster of Paris mould? How can sputtering of the metal, when poured in the mould, be prevented, and how can I get a smooth casting? Could a small furnace, say 4 in. inside diameter, 8 in. high, be made of fire brick, to produce sufficient heat for smelting small quantities of brass, lead, copper, or even iron, to be heated with small hard coal and a blast from bellows? A. You may possibly make a zinc casting in a plaster mould smooth by oiling the mould with linseed oil. A better way is to cast in moulding sand, such as brass foundries use. You may melt a few ounces of brass or copper in a small crucible in a furnace of the size you mention.

(2) C. E. B. writes: 1. I want to know the best way to make a small steam engine, one rating from one-half to one horse power? A. The inverted vertical engine is as good as any. For plans, dimensions, etc., consult the works on steam engineering. 2. Is the inclosed rough sketch for connecting the piston to the crank on a good and mechanical principle, and will it do its work as easily as the common slide (pillow) block connection? A. It cannot be used as sketched; there must be a guide on the outer end of rod. The "yoke," as it is called, will have more friction than a crank pin box, and unless the yoke and connections are very stiff, will have a tendency to spring when in operation. A connecting rod is preferable. 3. What is the cause of the vibration of the armature on a telegraph instrument when it is connected by a wire to the base of the key? Is there any appliance which I can put on the instrument to obtain any power? A. An intermittent contact of the wire with the base. A small motor might be made to work on a similar principle, but there are better ways of obtaining power from electricity.

(3) J. C., Jr., asks: 1. Where is the castor oil bean most extensively raised? A. The castor bean is largely grown in Illinois, Missouri, and California, where it is made into oil. Large oil works in Jersey City, N. J., are purchasers of the beans from all parts. The bean is, as we understand, largely cultivated in Texas. If the large seed is used which is best suited to Southern soil, a hundred bushels to the acre may be produced. 2. By what means is it gathered—hand or machinery? A. Hand picking is usual. 3. How many gallons of oil does it yield per acre? A. We do not know the yield of oil per bushel or acre. 4. Does it take expensive machinery to extract the oil? A. It requires a mill and a press. The price is suited to the quantity of work to be done. Four hundred dollars to eight hundred dollars would probably set up a small oil works.

(4) A. W. H.—Most of the so-called bear's grease is prepared as follows: Take of washed hog's lard (dry) 1/4 lb. avoid rancidity; melt it by the heat of a water bath, add of balsam of Peru 2 drachms; flowers of benzoin and palm oil (bright), of each, 1 drachm; stir vigorously for a few minutes to promote solution. Then remove the pan from the bath, and after repose for a short time, pour off the clear portion from the sediment, and stir the liquid mass until it begins to cool. 2. For article on imitator coral see Parkesine, Celluloid, page 3617, SCIENTIFIC AMERICAN SUPPLEMENT, No. 227.

(5) J. F. A.—Your question is so indefinite that we cannot give you any satisfactory answer. The values of the different grades cannot be determined from cost of the trees, but from the differences in quality of the different gums, these being quite arbitrary.

(6) G. A. H.—For removing printer's ink from paper use a solution of chlorinated soda, called by some chemists Larabeges solution. Use as directed on label.

(7) A. and E. ask for directions for tempering coiled springs the best way, so as to get the most power out of a given size of spring? A. The tempering

of coiled springs requires much judgment, based upon experience with the particular kind of spring that you wish to temper. A coiled spring does not give us the faintest idea of its form, size, length, thickness, kind of steel, or whether it is a clock spring or car spring, all of which must be considered in the method of treatment. As a general rule, springs that are slender and liable to lose shape in a common fire, should be heated in an oven or muffle, and hardened in water or oil. The temper should be drawn in boiling linseed oil. Springs that have stiffness, like car springs, may be heated in a covered forge fire to good advantage, and hardened in lard oil. The temper can be drawn by burning off.

(8) W. C. J. asks: 1. What are the physical causes of yawning? A. Yawning is supposed to arise from a reflex action of the nerves, caused by weariness, and is kindred to many other kinds of involuntary motions, that are probably derived from the nerve centers. 2. What is the chemical reason that bicarbonate of soda relieves a burn? A. We presume that it is by neutralizing the acid products of decomposition arising from the burn. 3. What is the distinction between a fruit and a vegetable? A. There is no absolute distinction between fruit and vegetable, fruit being that part of the vegetable kingdom found growing upon stalks or trees, and containing the seeds and sometimes being the seed itself. Whereas all organic nature not animal is said to be vegetable. In common parlance our soil grown products for culinary use are called vegetables, and some that are really fruit are also called vegetables. The terms overlap so much by customary nomenclature that distinctions become difficult. 4. Can you instance an artesian well where the water is perfectly soft? A. We know of no artesian wells that produce water as soft as rain water.

(9) G. R. P. asks: 1. Is it advantageous to shellac the plates of a Holtz electrical machine? A. Yes. It prevents the accumulation of moisture. 2. Why are two carbons used in the Grenet potassium bichromate battery? A. The quantity of current is somewhat increased by the additional carbon plate. 3. How may I distinguish gutta-percha articles, as buttons, from those made of horn, vulcanite, etc.? A. By the odor developed by heat or friction.

(10) H. M. D. writes: 1. Should I have a return wire on a telephone line three hundred feet long? A. You may use either a return wire or a ground connection. 2. Can I have as many turns as I wish on the line? A. Yes. 3. Can I use two gravity batteries (one at each end) to work two bells, and what size wire should I use? A. Yes. Use No. 12 iron wire or No. 16 copper wire.

(11) W. S. G. writes: I am desirous of becoming an electrician. What books would be the best for me to study on the subject to learn it thoroughly? A. Begin with Ganot's "Physics," then study Gordon's "Electricity and Magnetism," Prescott's "Electricity and the Electric Telegraph," "Electric Batteries," by Naudet, "Electric Illumination," by James Dredge. As you continue your study, other works will suggest themselves.

(12) W. W. R. asks: Will you please explain the phenomenon of electrical currents as employed in telegraphic circuits—whether by the application of ground wires at the termini a direct current is formed, or that the circuit is completed by the attaching of ground wires, which communicates the electricity generated in the batteries to a general body of fluid which is supposed to permeate the earth? A. It has been demonstrated by the experiments of Wheatstone, Caselli, and others, that the earth is a great reservoir of electricity, and that currents flowing to the earth are dissipated.

(13) R. W. R. asks: Will you please inform me how to make the induction coil, as described in SUPPLEMENT, No. 160, vol. vii., Jan. 25, 1879, so that I can regulate the current to give strong or weak shocks? A. Make the bundle of iron wires forming the core of the coil movable, so that it may be pushed into or withdrawn from the coil.

(14) W. P. B. writes: Referring to SUPPLEMENT, No. 159, Jan. 18, 1879, in article on batteries, it is stated that in the porous cup of the "Marie Davy" quicksilver battery, protosulphate of mercury should be used in the form of a paste. I would like to know: 1. What substance is used with the mercury to form the paste, and in what proportions, respectively? A. Water. 2. Is protosulphate of mercury the same as the sulphate of mercury sold by dealers in chemicals? No. 3. Will such a battery be suitable for silver plating in a small way? A. It can be used in that way, but a Bunsen or Daniell is better.

(15) J. A. B. asks: What would take the scale off polished cast iron, the scale being caused by continuous heat for several hours? A. Use, by volume, one part sulphuric acid, one part nitric acid, two parts water, applied warm—either the acid or cast iron. Better, by far, remove the scale by simple polishing or abrading substances.

(16) G. W. D. sends us the following remedy for stopping the singing in bass violin strings caused by shrinkage of the gut. Release the string somewhat and place some olive oil on a woolen cloth, rub it up and down the length of the string; the oil will penetrate through the wire spaces and onto the gut, and will in a short time cause the gut to swell to its original size, and thus stop the singing.

(17) W. J. asks: Would you please inform me through your paper what would be the best form of battery for making copper electrolytes of any desired thickness? I wish a constant battery, which would require no attention for a couple of months. A. Daniell's or the gravity battery would probably answer your purpose. 2. Also if you could give directions for making nickel electrolytes of any desired thickness? A. We know of no method of making nickel electrolytes. You can make copper electrolytes and afterward nickel them.

(18) A. W. H. writes: in your SCIENTIFIC AMERICAN SUPPLEMENT, you published a description of a small electric light to work with a 3 cell bichromate battery. We would like to know if a 5 cell gravity battery would do, or if a gravity battery would do at all?

A. No. It would require a large number of gravity cells to do the same work. 2. Can you send us prices of the gas carbons and could they be sent by mail? A. Carbon plates are not very expensive. The price depends upon the size. Any of our dealers in electrical supplies can furnish them by mail. See our advertising columns.

(19) F. W. D. asks for a good varnish to apply to designs printed in fine gold bronze on thin leather, something which will protect the bronze without coloring the leather and will dry quickly? A. Pale shellac, 5 oz.; borax, 1 oz.; water, 1 pint; digest at nearly the boiling point, until dissolved, then strain. Equal to the more costly spirit varnish for many purposes; it is an excellent vehicle for water colors, inks, etc.; when dry it is waterproof.

INDEX OF INVENTIONS For which Letters Patent of the United States were Granted January 8, 1884, 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: Abdominal supporter, H. A. Traver; Accordion, E. Schreyer; Acid, concentrating sulphuric, M. A. Walsh; Alarm, See Bilge water alarm; Aluminum, obtaining, F. J. Seymour; Animal power, L. C. Strong; Astronomical apparatus, J. Davis; Axle journals, bearing for car, G. W. Stewart; Bag, See Mail bag; Balance wheels, crank adjustment for, J. B. Thurston; Bale band tightener, R. L. Willis; Baling presses, etc., screw driving mechanism for, P. Slattery; Bandage, suspensory, L. P. Griffin; Barrel hooping machine, Duff & Allan; Battery, See Secondary battery; Storage battery; Bier or coffin stool, J. N. Knox; Bilge water alarm, G. W. Gilmore; Billiard cue tip, Easthope & Schneider; Basting rack, method of and tool for, J. L. L. Knox; Blind slats, device for wiring, G. W. Soule; Board, See Cigar maker's board; Sleeve board; Boats from celluloid, etc., manufacture of, Pitman & Alaire; Boot, W. Irvin; Boot, Wood & Bond; Boot or shoe, G. C. Buch; Boot or shoe stitching jack, J. F. Ames; Boot strap, C. B. Lamb; Boots and shoes, exhibiting, C. L. Higgins; Boots and shoes, manufacture of, E. L. Sprague; Bottle and stopper, J. Story; Bottle stopper, glass, J. Story; Box, See File box; Paper box; Bracelet safety appliance, E. Jones; Brake, See Car brake; Wagon brake; Breastpin, D. F. Adams; Bricks, tiles, etc., manufacture of, A. Dimpfl; Bridle, M. M. Hitt; Broom machine, Hoyt & Storck; Buckle, I. Hartmann; Buckle guard, harness, F. G. Harrison; Buckle, trace, D. Schoenthaler; Buffing and polishing devices, manufacture of, L. Levett; Buffing wheel, H. E. Fowler; Burial windlass, J. P. McDonald; Button hole, F. Beiermeister, Jr.; Button hole, stitching machine, D. W. G. Humphrey; Button setting apparatus, S. L. Pratt; Buttons, attaching, W. H. Wood; Calculator, percentage, S. J. Tucker; Can, See Packing can; Can filling machine, J. Stevens; Can opener, H. Bentham; Canning device, fruit, F. Deplanty; Car brake, S. Fairman; Car brake, fluid pressure, R. J. Wilson; Car coupling, J. C. Bryan; Car coupling, C. Devlin; Car coupling, P. Madsen; Car dumper, T. S. Stewart; Car, railway passenger, E. P. Osgood; Car, railway passenger, W. H. Paige; Car starter and brake, G. M. Hatnaway; Car wheel, G. W. Miltimore; Car wheel, H. G. Taylor; Carbureting apparatus, air, W. F. Burrows; Carpet stretcher, N. A. Veline; Carriage spring, B. P. Morrison; Carrier, See Hay carrier; Cart, road, J. W. Breed; Cart, road, H. Hortop; Cartridgering, extractor, J. Murphy; Case, See Egg case; Show case; Caster, furniture, G. D. Clark; Checkrower wires, machine for forming, G. B. Durkee; Cigar cutter, Gratz & Hagedorn; Cigar maker's board, A. Thulheimer; Cigar wrappers, machine for cutting, J. R. Williams; Clamp, See Rope clamp; Cleaner, See Coal cleaner; Clocks, device for removing mainsprings from, D. Switzer; Coal cleaner, W. H. Shepherd; Coal drilling machine, J. M. & J. W. Davies; Cook, stop and waste, H. Taylor et al.; Compressor for compressing bran, etc., into packages, G. A. Chapman; Cooler, See Water cooler; Cooler for uniting oils in the manufacture of lard, etc., S. H. Cochran; Cotton elevator and cleaner, seed, W. T. Taylor; Coupling, See Car coupling; Pipe coupling; Rod coupling; Shaft friction coupling; Thill coupling; Crutch, W. E. D. Ludlow; Cultivator, N. Coleman; Cultivator, F. L. Hilsabeck; Curtain fixtures, spring roller for, J. B. Finch; Cutter, See Cigar cutter; Cuttingout garments, machine for, S. Rich; Dental engine hand piece, A. W. Browne; Die shaping, Chamberlain & Martin; Dieshaping apparatus, Chamberlain & Martin; Ditching machine, tile, Hoehn & Hilburn; Draft regulator, W. F. Grassler; Drill, See Grain drill; Rock drill; Drop lights, friction clutch for, Travis & Freaney; Earth, gravel, etc., apparatus for transporting and dumping, Q. A. Flisk; Egg case, folding, J. D. De Berry; Elastic fabric, G. C. Moore; Electric circuit closer, C. J. Van Depoele; Electric conductor circuit, underground, E. T. Starr; Electric machine regulator, dynamo, C. J. Van Depoele; Electric machine regulator, dynamo or magneto, F. Bain; Electric motor, L. W. Stockwell; Electric motors, current regulator for, C. J. Van Depoele; Electric safety cut out, C. J. Van Depoele; Electric conductor, underground, Greives & Beoo; Electrical indicator and alarm, W. H. Baker; Elevator, See Cotton elevator; Hay elevator; Water elevator; Elevator, Beroud & Walsh; Elevators, safety automatic stop attachment for, O. Brugger; Engine, See Steam engine; Engine, S. N. Silver; Envelope machine, H. A. Mann Jr.; Evaporator, A. Kayser; Extractor, See Cartridge ring extractor; Eyelet stitching machine, C. J. A. Sjoberg; Fan, blast or exhaust, Capell & Macbean; Faucet, self-closing, S. & S. L. Barker; Faucet socket, Kincaid & Chaudler; Feed water heater, W. Rollar; Fente wires, machine for stretching and removing, J. N. Killough; Ferrules machine for making coiled wire, J. Crowfoot; File box, E. W. Byrn; File, letter or bill, O. C. Mackenzie; Filter, J. Toland; Fire escape, C. Kehr; Fire escape, Moore & Marcus; Fire escape, D. C. Pierce; Fire escape, permanent, T. Clarke; Fire escape, portable, T. Clarke; Fire escape protector and supporter, H. Fairbanks; Flanging machine, R. C. Nugent; Floor jack, T. L. Wilber; Flour packing machine, A. C. Hartzoke; Flue and pipe welder and fitter, Fleck & Herring; Folding table, N. H. Long; Fruit picker, G. A. Smith; Furnace, See Hydrocarbon furnace; Furnace mouth, T. O'Brien; Furnaces, pig carrier for blast, F. W. Gordon; Gage, See Plow gage; Saw mill gage; Steam gage; Gas, apparatus for manufacturing, J. L. Stewart; Gate, W. J. Hamilton; Gate, Williams & Preston; Gold and silver from their ores, by combined electrolytic and amalgamating processes, process of and apparatus for obtaining, M. Body; Grain binder, E. M. Deane; Grain breaker and grinding mill, J. M. Speer, Jr.; Grain drill, H. P. Tenant; Grinding machine, J. B. H. Leonard; Grinding machine, J. H. Reed; Grinding mill roller, G. Van Name; Guard, See Buckle guard; Harness, G. Thompson; Harrow, rotary, J. H. Hoof; Harrow, spring tooth, E. C. Comstock; Harvester and husker, corn, J. W. Terman; Hat hanging attachment, W. H. Barry; Hat ironing machine, N. B. Hooper; Hat lining, C. Raymond, 2d; Hat lining and cover, J. H. Canning; Hatchway, self-opening and closing, D. Humphreys; Hay carrier, P. A. Meyers; Hay elevator, P. Werum; Hay stacker, J. Coombs; Heater, See Feed water heater; Heating apparatus, steam, F. Tudor; Heel burnishing and miling machine, P. J. Lapham; Heel plate, E. Hoxie; Hides and skins, tawing, A. Schultz; Hobby horse, J. R. Wharry; Hoe, weeding, I. Gates; Holder, See Knife holder; Lead and crayon holder; Paper holder; Paper bag holder; Pen holder; Sash holder; Tool holder; Horse detacher, N. R. Shealy; House, See Sheep house; Hydrocarbon furnace, R. B. Avery; Ice cream freezer, V. Clad; Ice making and refrigerating apparatus, Reynolds & Allen; Indicator, See Electrical indicator; Latitude indicator; Inkstand, T. B. Knowles; Insulating connection for electric light fixtures, C. H. Hinds; Insulating material, electrical, J. Greives; Interlocking apparatus, hydraulic and electric, O. Gassett; Jack, See Boot or shoe stitching jack; Floor jack; Joiner's marking gage, E. Hester; Knife holder and package, G. F. Felch; Knob attachment, W. H. Gonne; Knob, door, J. K. Clark; Lacing hooks, method of and machine for making, S. N. Smith; Lamp, electric, C. J. Van Depoele; Lamp, electric arc, C. J. Van Depoele; Lamp, self-extinguishing, Scott & Manwaring; Lamps, safety cut out for series of electric, C. J. Van Depoele; Lard and oil tank, H. Rall; Latch, W. Sallade; Lathe attachment, watch maker's, O. F. Main; Lathe, tubular cutter, L. S. Hayes; Latitude indicator, P. Boyhan; Lead and crayon holder, W. L. Butterfield; Leather splitting machine, F. S. Strong; Lifter, See Transom lifter; Lock, See Permutation lock; Lock, Andrews & Sparks; Lock, P. P. Clark; Lock, A. B. Todd; Locomotive lubricator, C. B. & C. H. Hodges; Loom shuttles, tension regulating device for, G. Baldwin;