

Business and Personal.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.

Woven wire brushes.—The Belknap Motor Co., of Portland, Me. are the patentees and manufacturers of the best woven wire commutator brush on the market.

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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 This is for our information and not for publication.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.

(6375) T. D. L. asks: Can a permanent magnet be made equally as strong as that of an electro-magnet by any desired strength? A. No; an electro-magnet may be much stronger.

(6376) E. C. S. writes: In a recent discussion as to the velocity of falling bodies, I made the general statement that all bodies fell with equal velocity, recognizing, of course, the apparent exceptions, such as feathers, etc. Will you kindly throw some light on the matter, as one of our local scientists maintains that a heavy body will fall with greater velocity than a lighter one. The Encyclopedia Britannica, under the head of gravitation, states that bodies fall to the earth with equal velocity, irrespective of material of which they are composed. Upon this and the fact that there is a rule giving the velocity of falling bodies 161 feet for the first second, etc. I base my opinion. A. The law of falling bodies applies to bodies falling in vacuo. In the air a heavy body, ceteris paribus, falls faster than a light one. The Encyclopedia Britannica statement applies to a vacuum. The air offers very high and generally underestimated resistance to falling objects.

(6377) H. A. says: Can you give a good recipe for renewing the ribbons of typewriters with red, cord or with copying ink of different colors? A. Take vaseline (petroleum) of high boiling point, melt it on a water bath or slow fire, and incorporate by constant stirring as much lamp black or powdered drop black as it will take up without becoming granular. If the vaseline remains in excess, the print is liable to have a greasy outline; if the color is in excess, the print will not be clear. Remove the mixture from the fire, and while it is cooling mix equal parts of petroleum, benzine, and rectified oil of turpentine, in which dissolve the fatty ink, introduced in small portions by constant agitation. The volatile solvents should be in such quantity that the fluid ink is of the consistency of fresh oil paint. One secret of success lies in the proper application of the ink to the ribbon. Wind the ribbon on a piece of cardboard, spread on a table several layers of newspaper, then unwind the ribbon in such lengths as may be most convenient, and lay it flat on the paper. Apply the ink, after agitation, by means of a soft brush, and rub it well into the interstices of the ribbon with a tooth brush. Hardly any ink should remain visible on the surface. For colored inks use Prussian blue, red lead, etc., and especially the aniline colors.

Aniline black. 1/2 oz. Pure alcohol. .15 Concentrated glycerine. .15 Dissolve the aniline black in the alcohol, and add the glycerine. Ink as before. The aniline inks containing glycerine are copying inks.

(6378) The F. R. Co. asks: 1. Is it possible to charge an electro-magnet with the secondary current from an induction coil? If so, please name the

best form of construction. A. Not to advantage. It requires a very long coil and involves loss of efficiency. 2. Your description of the magneto bell requires the L shaped piece which holds the armature to be a permanent magnet. Why is this necessary? A. To polarize the electro-magnet.

(6379) P. asks: 1. What advantages are claimed for metal as a developer? Could you give me a receipt for a developer containing it, and directions for use? One with which I can have most control over the plate, and which will keep when mixed for use, as I often want to develop one or two plates at a time. A. Metal is very energetic in its action, has remarkable staying qualities, keeps clear, does not stain the film in the shadows, and is easy to work. The following is a good formula:

Metal. . . . . 5 grains. Sodium sulphite crystals C. P. . . . . 25 Water. . . . . 1 oz.

Dissolve metal first, then sodium sulphite. If kept in a tightly corked bottle, the solution will remain colorless for two or three months. This is a stock solution. To develop a 4x5 plate, take 1 1/4 ounces of the above, add 3/4 ounce water and pour over the plate; if fully timed, the picture will gradually appear and rapidly gain density and detail. If the time has been short, add to the solution a few drops, four or five at first, of a carbonate of potash solution, prepared by dissolving one ounce of potash in three ounces of water. Keep adding a little at a time until the development proceeds rapidly enough to suit. The used developer should be kept in another tightly corked bottle. Eight 4x5 plates can be developed with these 2 ounces of developer. At end of that time development will be very slow and the developer will have a peculiar pungent odor when the nostrils are placed near it. This signifies that it is ready to be thrown away. 2. An easy way of regaining gold from waste toning solution. A. Gold may be recovered from waste toning solutions by adding a solution containing 32 grains of proto-sulphate of iron to every gallon of waste. The gold will be precipitated to the bottom. The clear liquid should be drawn off by a siphon and the residue poured upon a filtering paper and washed by pouring over it boiling water until the wash water no longer produces a precipitate with a solution of barium chloride. The gold is now redissolved with aqua regia and the solution slowly evaporated to dryness over a sand bath. The yellow crystalline salt may then be dissolved in water to make up a fresh toning bath, or put in an airtight bottle. 3. What can I use to finish off the woodwork of a camera (tripod)? A. Fill the grain of the wood with a filler of appropriate color, and when dry give the tripod a flowing coat of shellac varnish.

(6380) C. K. H. asks: 1. What is considered the best material to put between the flooring to deaden sound? If felt or paper will do, what kind is the best? The floor is of a hall over a store and is to be sound proof, at the least expense. As parties are figuring on putting in an electric lighting system in the building, a plant of from 100 to 150 incandescent lights, and running same with a gasoline engine, will you give an idea of which is the best engine and dynamo for the purpose and the cost of same? It will require from 10 to 15 horse power we are informed. A. A double floor with mortar between is probably the best sound insulator. For the address of engine and dynamo builders we refer you to our advertising columns. 2. Do you think it practicable to install an electric lighting plant for stores or hall and run same successfully with a gasoline engine? A. Gasoline engines have been successfully used for electric lighting; we believe they have proved to be economical.

(6381) J. H. L. asks: 1. How shall I wind the fan motor described in SUPPLEMENT, No. 767, so as to be suitable for a 100 volt circuit? A. We advise you not to try the motor on a current of such potential. You might wind with No. 36 wire and start with a rheostat. 2. Where can I get instructions for making a voltmeter? A. See our SUPPLEMENT, Nos. 558, 552, and 353, for descriptions of voltmeters. 3. Where can I get instructions for making a small fan motor of the alternating induction type? A. For alternating current motors, see our SUPPLEMENT, Nos. 601, 653, 692, 717, and 944. These describe different motors, but do not give full working details.

(6382) E. P. B. asks: 1. Is it feasible to make a storage battery for electric light work of one lead plate for a positive pole and a single zinc stick for a negative pole? A. This is hardly feasible. 2. State the amperes needed to charge 144 square inches (all told) of positive plate? A. 5 amperes. 3. What is the discharge for the above surface? A. 5 to 6 amperes. 4. Is asbestos a perfect insulator? A. Nothing is a perfect insulator; dry asbestos is almost a perfect one.

(6383) W. A. H. asks how to wind an induction coil, for use on a Hunning's transmitter. Crowfoot gravity batteries, three in number, to be used. I wish to know size and quantity of wire to be used on both primary and secondary. Which will give best results on Hunning's transmitters—open circuit or gravity cells? A. Wind primary to 36 ohm with No. 24 wire, secondary to 80 ohms with No. 36 wire. Use open circuit batteries; the Crowfoots will tend to local action by deposition of copper on the zinc.

(6384) A. N. X. asks: To persons using the same living rooms with a victim of consumption, and where cuspidors are used indiscriminately, is there any danger from contagion? A. There is no doubt that the practice is dangerous. Use individual cuspidors and place disinfectants, such as zinc sulphate, in them. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 782, 824, 959, and 973, for articles on consumption, its cure, prevention, etc.

(6385) S. J. R. asks: 1. How can I make a good but inexpensive microphone? A. See our SUPPLEMENT, No. 163. 2. I have two Samson batteries on a burglar alarm system. Before retiring last night I tested the alarm and it worked all right. About an hour after I heard a noise resembling an explosion, and opening the closet, in which I keep the batteries, I found that one of them had burst all to pieces, and the fluid was thrown all over everything. A. Possibly the glass battery jar was badly annealed. This or some accident throwing it down are the only causes assignable.

(6386) W. H. B. asks how to proportion a primary spark coil to get the best results with the least

amount of material, to best adapt it to a battery of known amperage and voltage. A. The calculation cannot be made except approximately. The voltage to be developed must be known. Then the size of core and turns of wire must be based on the ratio of 10<sup>9</sup> lines of force cut per second for one volt produced. The great trouble is in the leakage coefficient for the lines of force.

(6387) F. X. W. asks: In regard to eight light dynamo in SUPPLEMENT, No. 600, what alterations, if any, are necessary in winding, to change said dynamo into motor, and what horse power would it develop if used as a motor? A. Wind in shunt. The size of wire depends on the voltage. It would give about one-half horse power.

(6388) F. W. G. asks how many volumes a mixture of gas and air—10 to 1 (at ordinary pressure) makes on explosion. A. It depends on the composition of the gas; from 6 to 10 times the original volume, but instantly going back to about the original volume.

(6389) C. R. B. asks: How much rainfall a fall of 12 inches of snow would represent, and if the snowfall of a year is counted in making up the report of the annual rainfall? A. If light snow, it would give a little over an inch of water. To get accurate results, the snow must be melted so as to give a determination for every snowfall. The value of the snow in water counts as rainfall.

(6390) P. E. A. asks: Can a person see the stars in broad daylight by descending into a deep well which is in darkness and looking up to the sky? How many feet down would a person have to descend? A. Stars can readily be seen in the day time from the bottom of deep wells and mines. A hundred or more feet down is sufficient. Stars of the 3d and 4th magnitude are about as small as thus can be seen.

(6391) W. D. asks: What is the process of cleaning sea shells to make them look bright and clean? A. Dark-colored organic matter on the outer surface is first removed by making a thick mixture of one part bleaching powder to two parts of water and soaking the shell therein. On removing wash and scrub it. Thick incrustations of lime must be picked off with a sharp-edged hammer or some similar tool, and then the shell must be dipped in boiling dilute hydrochloric acid. Valuable shells may have the face or pearly portion covered with shellac varnish, which may be removed with alcohol after the acid bath. For strong, heavy shells use 1 acid to 3 of water; for delicate shells use 1 part acid to 10 of water. Dip the shell for a second only, wash and examine; if not enough, give it a second dip. Hold it in wooden forceps or attach it to a stick in any way to serve as its handle. The important point is not to let the acid stay long on the shell. For local spots it may be applied with a brush.

TO INVENTORS.

An experience of nearly 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 in 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

January 22, 1895,

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 Adjustable table, Air brake, Alloy for soldering, Armature bars for dynamo-electric machines, Apparatus for bending, Armature coils, Armature for assembling laminas, Atomizer, Automatic stoking furnace, Background support, Bailers for oil, Barrel roller, Barrels, Kegs, etc., Battery, Beans, Bearing for screw hoists, Beater, Bed rest, Berth, Bicycle dynamo, Bicycle rim and tire, Blast furnace, Blind fastener, Blind stop, Boiler, Boiler feeder, Bolt cutter, Book, self-recording, Bowling ball, Bowling pin, Box, Box trimming machine, Bracket clamp, Brake, Brakes, Breast supporter, Brick cutting machine, Brooches, jewelry, etc., Brush holder, Buckle, Bullet proof shields, Bung, barrel, Button setting machine, Button spring, Cabinet for holding money, Cable grip, Calcining machine, Calendar, Call generator, Can, Cans, Car brake, Car coupling, Car coupling, A. Anderson, Car coupling, R. F. Ludlow, Car fender, W. L. Fees, Car fender, Reynolds & Center, Car fender, street, J. J. Kennedy, Car fender, street, B. C. Breed, Cars, constructed on railway, B. F. Allen, Cardboard cutting or scoring tool, Salkzorn & Nicola, Carpet sweeper stand, A. D. Linn, Carriage, lime, M. Settle, Cash register, R. P. Thompson, Cash register and indicator, T. Carney, Chair, See Convertible chair, Chill, J. Mathews, Cigar casing, N. Schwab, Cistern, H. P. Scheffer, Cistern mould, I. W. Simpson, Clamp, See Bracket clamp, Moulding flask clamp, Clip, See Whiffletree clip, Clock striking mechanism, O. G. Ahlstrom, Closet seat and foot rest, F. G. High, Cloth holding and display reel, A. M. Guyton, Church, electrically operated, T. H. Macdonald, Cock, gauge, J. H. Grubb et al., Coffee pot, W. W. Newcomb, Coin displayer, T. Carney, Collar and pad, combined inflatable horse, H. G. G. Stichel, Collar, horse, H. G. Stichel, Jr., Combination lock, J. Bois, Commutator brush, M. R. Hirsch, Converter, A. W. Billings, Convertible chair, D. C. Breed, Copper netter, Nicholls & James, Cotton press, C. Banister, Cotton press, Banister & Hollingsworth, Coupling, See Car coupling, Repair coupling, Thill coupling, Curves, device for producing cycloidal, Wainwright & Morrison, Cushion holder, L. J. Smith, Cutter, See Feed cutter, Pipe cutter, Cutter bar, J. A. Kmsley, Dental bridge work, E. G. Smith, Dish cleaner, B. Yancey, Dishy apparatus electrical, J. L. Ketcher, Door spring, J. Keene, Doors, etc., device for preventing sagging of screen, W. H. & W. J. Clark, Drill frame, portable, J. C. Jones, Drill shoe, grain, N. M. Wig, Drills, supporting clamp for extension, G. A. Traffer, Electric machine regulator, dynamo, L. Bell, Electric meter, E. Thomson, Electric safety device, C. T. Penton et al., Electrical conductor, E. D. Lewis, Engine, See Gas engine, Steam cylinder engine, Steam engine, vapor engine, Fan attachment, R. Taggart, Fan, motor, electric, J. L. Ketcher, Feed cutter, L. F. Berneide, Felt letter, W. Campbell, Felting machine, R. Heaton, Fence lock, B. F. Nelson, Fence stay, wire, H. Buck, Fence wire tightener, H. W. Norton, Fender, See Car fender, Filing machine, J. Riddell, Film holder, Barrett & Edgerton, Filter, R. J. Balch, Fire extinguishers, valve for automatic, F. Gray, Fishing net closing and hauling-in apparatus, H. Hommerberg, Flashlight device, T. H. Macdonald, Flushing valve for animals, W. Scott, Fumigator for plants, trees, etc., Hendrix & Houghton, Furnace, See Automatic stoking furnace, Blast furnace, Creation furnace, Furnace air heating and regulating device, C. Boyer, Galvanic battery, C. B. Schoenmehl, Garbage cremation furnace, I. A. Knapp, Garbage treating apparatus, F. J. Machalski, Gas, apparatus for manufacturing water, A. G. Glasgow, Gas engine, Cawley & Haines, Gas engine, P. P. Miller, Gem setting, E. Schill, Generator, See Steam generator, Giz mill, G. & H. Bauche, Glove, F. H. Hunnicke, Gold or silver from ores, extracting, J. C. Montgomerie, Gold separator, R. Blanchard, Gold upon composition roads, machine for fusing, C. R. Smith, Governor, centrifugal high speed, F. W. Sacke, Grain binder butter, J. E. Mustard, Grain storage building, metallic, E. O. Fallis, Graphophone, disk, J. E. Wassenich, Grinding or crushing machine, J. Prince, Guns, cocking mechanism for breakdown, F. W. White, Jr., Harness, C. A. Rahn, Harvester, corn, W. T. Harris, Hay carrier, P. A. Myers, Heat or gases of combustion, apparatus for utilizing, H. Lefler, Heater, See Hot water heater, Steam or hot water heater, Hoisting and conveying apparatus, H. B. Tefft, Hook, See Meat or other hook, Ring hook, Horseshoe calk sharpener, E. C. Lainson, Hot water boiler, M. Furlong, Hot water boiler, H. K. Tallmace, Ice cream freezer, Ottino & Rafle, Ice making apparatus, W. L. Church, Ice manufacturing apparatus, J. P. & C. E. Stromberg, Indicator, See Lamp filling indicator, Insect destroyer, Merrill & Morley, Insect trap stand, W. L. Peeler, Insulators, screw press for forming, S. Kribbs, Iron, See Sad iron, Kiln, See Porcelain kiln, Knitting machine, circular, C. E. Kelley, Knitting machine, feeding attachment, J. D. Hemphill, Ladder and parts therefor, metallic, F. Johnson, Ladder or stairway, P. A. Myers, Lamp filling indicator, J. C. Miller, Lamp, incandescent, M. H. Brannin, Lath, Lath, metal, Z. Coos, Lathing, metallic, T. L. Banks, Levelling device, J. Daugh, Lock, See Combination lock, Fence lock, Saxe lock, Seal lock, Lock, C. A. Erie, Lock, G. T. Hetzel, Lock, J. E. Mitchell, Locomotive boiler, J. T. Connelly, Loop set, A. G. Schmidt, Lounge for railway carriages, portable, Glaser & Lubricator, H. Sims, Mail box, electric alarm, E. C. T. Belding, Measure register, grain, J. A. McFayden, Measuring apparatus, E. Von Lanke, Meat or other hook, E. Krause, Mechanical action, A. T. Housen, Metal cutting machine, shape, L. S. Proufs, Meter, See Electric meter, Mill, See Gig mill, Mine trap door, H. Keyes, Mining tool, F. Farley, Mirror, See Casket mirror, Wanner, Jr., Mould, See Cistern mould, Moulding flask clamp, Van Court & Madeira, Motion, intermittent grip device for transmitting, J. J. O'Neill, Motor, See Fan motor, Mouse trap, H. Obermeyer, Multicylinder engine, L. C. Warren, Musical chart, R. H. Ingraham, Nut lock, Davis & Bowers, Ore concentrator, J. J. Cranmer, Ores or other substances, means for concentrating, L. H. Gordan & Gordan, Packing and storing vessel, A. Burson, Packing box, G. E. Grimm, Packing box or crate, J. S. & C. W. Reid, Padlock, feathering, C. A. Long, Padlock, master key, J. Roche (r), Panels, construction of curved and veneered, H. Widdcomb, Paper making machine, R. W. Moncrieff, Pen, drawing, V. Berdelle, Photographic print washer, J. W. C. Floyd, Piano, See Casket piano, Piano, See Casket piano, Pile fabric, ornamenting selvedge of, P. A. Menckers, Pipe cutter, W. W. Tucker, Pivoted can, L. O. Brown, Plane, bench, Traut & Schade, Plane, combining, corn and potato, Gilbert & Cheate, Pneumatic transfer tube system, F. W. Jones, Porcelain kiln, E. M. C. Gondeuin, Pot, See Coffee pot, Prescription stand, R. S. Vitt, Press, See Casket press, Casket press, Pressure regulator, fluid, C. L. Bastian,