

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 This is for our information, and not for publication.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) L. H. writes: A man who has had considerable to do with steam engines and boilers, as fireman and engineer, asserts that it requires more water (more pumping at least) to run an engine when the atmosphere is charged with vapor and the barometer low than at other times. He states that the experience of other engineers and firemen of his acquaintance agrees with his own in this matter. Is it probably true, if so, how explained? A. It is probably not true. The barometric variations in the density of the atmosphere may make a very slight difference in the pressure gauge reading, and also in the action of the fire. Low barometer with saturated air also affects the draught and combustion.

(2) B. M. W.—The gas which escapes from the earth in the localities of natural gas wells is supposed to have been generated by the internal heat of the earth, and confined to the porous or cavernous lower strata of rocks by a later deposit and hardening of a close grained upper strata. There is a possibility of a slight depression of the earth's surface in the oil and gas region, unless the percolation of water should in a measure counteract it. The depth at which the gas cavities are tapped is equal to a water pressure from the surface of several hundred pounds to the square inch. The thickness of the solid crust of the earth is probably from 50 to 75 miles, although there is room for a variety of hypotheses on this point.

(3) W. L. R. desires (1) a recipe for making varnish black, such as used on iron work, like sewing machines. A. Such work is japanned, not varnished. See SUPPLEMENT, No. 316, on process. 2. What kind of acid is used for testing gold, how is it used, and how will it act? A. Test with nitric acid. It will have no effect on gold, but readily dissolves most other metals usually met with.

(4) J. N. C. desires the formula for making the "walnut hair dye." A. The simplest form is the expressed juice of the bark or shell of green walnuts. To preserve the juice, a little alcohol is commonly added to it with a few bruised cloves, and the whole digested together, with occasional agitation, for a week or fortnight, when the clear portion is decanted and, if necessary, filtered. Sometimes a little common salt is added with the same intention. It should be kept in a cool place. The most convenient way of application is by means of a sponge.

(5) V. G. (Mexico).—Apparently no very complete exhaustive analyses of the poison of the scorpion have yet been made. The best on record are those by Jousset, presented to the French Academy in 1870 and published in the *Comptes Rendus* of that year. He gives no definite statement of the chemical constitution of the venom, but does state the mode of its action upon the blood, by which in severe cases it causes death. It effects the red corpuscles, paralyzing them so that they cohere one to another, thus becoming agglutinated until they are unable to pass through the capillaries, and may cause fatal obstruction. So far as known, there is no chemical antidote which can neutralize the poison, but inasmuch as, like all animal poisons, the action on the nerve force, or in other words, the vital force, is in the nature of depression, a remedy which stimulates that force temporarily is plainly indicated; alcohol is always available for that purpose, and being easily obtained, is perhaps more serviceable than any other. Bromide of potassium is of high value, but can be used safely only by the physician himself.

(6) F. A. T. asks for any means to prevent hands from perspiring. A. Use the following prescription:

- B. Acid tannic..... ʒij.
Aqua rosal..... ʒss.
Spt. Vin. Rect..... ʒiiss.
Aquea..... ʒiij.

M. S. Use as a wash, each night and morning with a soft sponge. The skin should be thoroughly cleansed with soap and warm water and carefully dried and then apply the wash as directed.

(7) J. P. E. writes: I have been troubled for over a year with pimples on my face, what can I do to get rid of them? I have been taking medicines for nearly three months and find no change. A. The pimples are probably an affection known as acne. They are of no consequence except for the unsightly appearance which they cause. They are exceedingly common among young people, and almost invariably cease to show themselves at the age of 20 to 22. Medicines have of course been tried in every available form both external and internal, for the beauty of a smooth skin is too universally prized to allow any neglect of care. But they are of very little service, as the best authorities all agree. Remedies are advertised continually; have nothing to do with them; they will do you no good, and may, on the contrary, injure the skin seriously. For full article on this subject see SUPPLEMENT, No. 542.

(8) S. T. B. asks: What material and process to use in order to give the final or black finish to lenses? A. The finest jeweler's rouge on a pitch lap. Vienna lime is used by some for the last finish, in the same manner as the rouge.

(9) A. A. G.—The soot indicator is used as an indicator of electric currents or of the variations in the intensity thereof. A strip of paper blackened with soot is used to receive the indications, whence its name is derived.

(10) A. H. asks: If it were practicable to use rods of pure iron as carbons in an electric arc lamp, what would be the color of the light? If black oxide of iron was made into rods (as the present carbons are) and used as carbons, what would be the color of the light? A. The light from metallic electrodes would not be so intense or so blue as from carbons, but would resemble it in most respects. The arc would be made very long. The metal would impart no color that would be noticeable. Magnetic oxide has such high resistance that it is hard to see how it could be successfully used for electrodes. If this trouble was surmounted, it would offer further difficulty on account of its fusibility. It would give a long arc similar to that given by metallic iron.

(11) E. A. H.—One of the simplest and best methods of rendering the basement walls of a building damp-proof is to construct on the outside an area wall so that the earth does not rest directly against the main wall of the house, but only against the outside wall or casing of the area. To form such an area, build a wall half or one brick thick parallel to and some 2 or 3 inches from the main wall, and form at the bottom a channel or gutter connected with the drains, so that any moisture or water finding its way in through the outer casing may be conducted away and will not therefore penetrate into the building. Thoroughly ventilate the areas by means of air bricks or other suitable connections with the outer air, and connect with one another by making through connections underneath the floor joists. Be very careful that the main wall is laid on a good and efficient damp course. The top of the space between the area and main walls may be covered in all around the building with bricks—ornamented or otherwise, as preferred—on a line just above the ground. Another plan of effecting the same object is to dispense with the area wall and in building the brick work to cover the whole of the work on the outside with a thick layer of bituminous asphalt. The plaster on the inside is in this case often rendered in nearly neat Portland cement.

(12) H. T. H. asks for a near relative standard amount and size of wire on armature and fields of any dynamo using two field magnets. A. You may figure on obtaining 14 to 49 watts (volt ampere) per pound of copper wire. Any size may be used to produce varying relations of potential and quantity. Edison uses copper bars on the armatures of his large dynamos.

(13) C. W. H. asks: How is the gilding done on watch plates and wheels to produce the color and finish, as they are when new? A. After plating with gold, using the regular solution (cyanide), immerse in a mixture of:

- Copper sulphate..... 3 parts by weight.
Verdigris..... 7 " " "
Ammonium chloride..... 6 " " "
Potash nitrate..... 6 " " "
Acetic acid..... 31 " " "

Use solids in powder. After dipping, heat the articles on a plate of copper until they turn dark or black, and then treat with concentrated sulphuric acid. Or instead of above mixture use:

- Alum..... 3 parts by weight.
Potash nitrate..... 6 " " "
Zinc sulphate..... 3 " " "
Sodium chloride..... 3 " " "

Use as a paste; coat articles with it, heat on iron plate until they turn black, and wash with cold water. 2. What is the process used to plate silver on iron or steel, such as table knives, for instance? A. After cleaning steel with greatest care, plate with thin adherent coating of copper, and silver plate on that. 3. What would be the power of an electric motor made with six ten-inch permanent magnets and a 12 by 4 inch armature wound with three pounds of No. 14 wire and 12 gravity batteries? A. Probably not over 1/12 to 1/10 of a horse power.

(14) J. D. asks: 1. In making the dynamo electric machine in SUPPLEMENT, No. 161, three or four times larger than the description there, should the wire be also increased in thickness? If so, in what proportion? A. Increase the size of wire in same lineal proportion, i. e., if machine is twice as large, use wire of double diameter. This is a general rule only; the thickness of wire for any machine would depend on the class of work it was to do. 2. Is soft gray iron best for both armature and magnets? A. Soft gray iron is the best kind of cast iron for the armature and magnets. 3. In making carbons described in SCIENTIFIC AMERICAN, April 10, which would be the best—coke or gas retort carbon; and would it be as good as a pure carbon plate? A. In general terms, the purer the carbon, the better. Coke we should give the preference to. It would be difficult to pulverize retort carbon sufficiently. 4. Could a wire be cast in it that would make a good connection? A. You could not cast a wire in it. You could drill and ream a slightly conical hole in its top, and force in a tapering plug with wire attached, or dip top of carbon in melted paraffine, plate it with copper, and clamp wire to that. 5. Are the carbons in the arc light made in this way? A. Arc light carbons are in general terms so made, but with differences in detail. Coal tar is sometimes used instead of sirup. In igniting the carbons, they should be covered with carbon or coke dust and protected from the air.

(15) M. B. asks how to connect a wire to a chloride of silver electrode. A. Melt the chloride of silver, and cast it in a mould around a flattened silver wire.

(16) J. W. W. asks: Can I deposit iron with the batteries, and how? A. You can do so by following method, as used in nickel plating. Dissolve clean iron wire in hydrochloric acid, using enough wire to leave a little undissolved. Then for every 60 parts of iron dissolved add 55 parts ammonium chloride, and a little glycerin may be added. Consult

H. Fontaine, Electrolysis, price \$3.50, which we can furnish. 2. How can I make an electro magnet capable of raising about 200 pounds from a distance of 6 inches from the poles, and how many gravity cells will I require? A. You would require a magnet of enormous power. Thirty or forty gravity cells might run it. Your only practicable way would be to extend the pole pieces and have the armature play between them, or to use a hollow core or axial magnet. See Du Moncel on Electro Magnets, price 75 cents, which we can furnish; also SCIENTIFIC AMERICAN, February 13, 1886.

(17) J. N. asks how to become an electrician. A. Try to get employment at any terms in some neighboring electric light factory or plant, and read standard works on the subject. A good course in the subject at college, as at Ann Arbor, Michigan, or Cornell University, Ithaca, N. Y., would be of great value.

(18) J. F. M. says: I wish to know how to fix a piano cover. It is made of rubber, and coated on the outside with a green flock. Now, I wish to flock it again. What must I use, so that it will still be pliable? A. Coat the surface with a glue, made by dissolving pure rubber in benzine, and while tacky, apply the flock.

(19) M. J. asks concerning weight of hay. A. According to Haswell, loose hay weighs 5 pounds to the cubic foot; pressed as in stack, 8 pounds; close pressed as in bale, 12 to 14 pounds. Hence, for hay in stacks you should allow about 280 feet for a wagon load of 450 to 500 cubic feet, because in its transfer to the wagon it will be considerably lightened.

(20) T. H. H. says: I observe that some at least of the ordinary batteries, with induction coil, for medical use, represent the secondary or induced current as having definite polarity like the primary. Is this not incorrect, and is not a "to and fro" current, or is there a modification made of it? A. Its polarity varies, constituting a "shuttle current." 2. In what respect, if any, is the induced current alluded to different from that from a magneto-electric machine? A. It is the same in general as to its effects, but possesses more quantity and less intensity.

(21) J. B. B. asks: 1. Is the use of brass spigots in drawing beer or porter injurious. If so, what would be the best kind to use? A. They have been condemned by good authorities, and lining with block tin is recommended. 2. Cannot ale or stale beer be "doctored" in such a manner as to be palmed off for porter? If so, how? Is quassa bark and caramel ever used? A. We are not authorities on "doctoring." 3. Are there not substitutes for malt, in the manufacture of ale, beer, etc.? Is rice ever used? A. Glucose is a substitute for malt. Rice malt may be used.

(22) J. W. P.—We are not familiar with the exact formula of the laryngeal lozenges you ask about, but Wistar's cough lozenge, which is of the same character, is prepared by mixing gum arabic, extract of licorice, and sugar, of each 2 1/2 ounces, powdered opium 1 drachm, oil of anise seed 40 drops, for 60 lozenges. One, three or four times a day.

(23) W. L. J.—Flowering plants may be kept over winter by packing their roots in a box of sand in a cellar; bulbs, by hanging in bunches in a cellar.

(24) C. N. Y. writes: I have a marble statue to repair. It is 3 feet high, and the feet are broken off. Can you inform me of a good cement that I can cement it with, or what do they cement marble together with? A. An excellent cement for your purpose can be made by adding to 1/2 pint of skimmed milk 1/2 pint of vinegar. Mix with this the whites of 5 eggs well beaten; then sift in with constant stirring sufficient powdered quicklime to form a paste.

(25) J. W. G.—The water of condensation in steam pipes can be returned to the boiler only by gravity, which requires that the water line in the boiler should be below the level of the coils or pipe work. This is common practice in steam heating. The exhaust from the engine can only be partially returned to the boiler by an exhaust injector (a new device). The water from steam heating pipes below the level of the boiler can be returned to the boiler by a device called a "return steam trap."

(26) J. P. D. asks (1) the kind of iron that should be used in the construction of spoke wheels for a light hand car. A. Make rim and hub of cast iron with wrought iron spokes (3/8 round iron notched and headed at each end) laid in the mould. Make the frame of wrought iron and wood. 2. Which is best to propel a hand machine—a chain belt, such as is used on tricycles, or ordinary cog wheels? A. Flat link is best.

(27) C. S. S. asks whether annealing boiler flues is an injury or not. A. Boiler makers sometimes anneal the ends of tubes for one or two inches when they are found to be brittle. The practice is not recommended. The trouble of split ends often arises from boring the holes in the tube sheet too large. Annealing the ends softens the iron, increases the scale, and shortens the life of the tube at the points that it wears the fastest.

(28) Inquirer asks (1) what chemical preparations will render fabrics fireproof or incombustible. A. You will find several recipes for rendering fabrics incombustible, in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 245. 2. If asbestos is soluble, and if so in what proportion. A. There are several varieties of asbestos, none of which are entirely soluble, but some of them are slightly acted upon by the stronger acids.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated.

J. M. H.—The specimen has the appearance of being pipe clay. On account of the nearness of excellent qualities of clay in New Jersey, it would have no commercial value in New York. Nothing positive as to its application could be given unless it was first

tested in a potter's kiln.—A. B.—The specimen appears to be infusorial earth, and is useful in polishing metal surfaces, etc. It would be impossible to find a market for it in any city, as the supply already exceeds the demand. It is well known under the trade name of electro-silicon. J. S.—The rock is simply limestone. It leaves little or no residue on treatment with acid.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted, May 11, 1886,

AND EACH BEARING THAT DATE.

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

Table listing various inventions and their patent numbers, including Aging liquors, Air compressor, Air heating apparatus, Alarm, Amalgamator, Ammoniacal liquor, Bags, Baling press, Band cutter, Bar, Barber's register, Barometer, Barrel trimming machine, Bearing for vehicles, Bed bottom, Bedstead, Belting machine, Bevel, Bicycle, Bicycle saddle, Billiard table leveler, Binder, Bird cage protector, Blind for windows, Blind, inside, Blind, window, Block, Blotter support, Board, Boiler, Boiler furnace, Boiler scale, Bolt, Boneblack drier, Boot or shoe uppers, Boots and shoes, Boots and shoes, attaching shank buttons to, Boots and shoes, seam stay for, Boots, making felt, Boots or shoes, tack driving mechanism for last, Boring bar, Boring machine, Bottle stopper, Box, Brake, Brick machine, Bridle, harness, Bridle winker, Buckle and chain supporter, Buffer, Buoy, automatic signal, Buoy, adjustable red for signal, Burglar alarm, Burnishing machine, Button, Button, cuff or collar, Cane, etc., extensible, Cans, filler and faucet for, Car and locomotive frames, Car, cable, Car coupling, Car coupling, J. D. Ripson, Car coupling, Rivett & Macfarlane, Car coupling, J. T. Wilson, Cars, grip for cable motor, Card engine, Carriage, baby, Carriage top former, Carrier, Cart, dumping, Cart, road, Case, Cash and parcel carrier, Cash carrier, Cash carrier, vacuum, Centerboard for vessels, Chain link, ornamental, Chimney protector, Chuck, truck brass, Churn, Wehmeyer & Alford, Cider press, Cigar bunches, Cigar bunches, machine for making, Cigar bundling machine, Clamp, Cleaner, Clock and clock system, electric, Clock, electric pendulum, Clocks, winding and controlling system for electric, Clothes wringer, Cocoa, method of preparing, Collar or cuff, Collar or cuff, V. H. Rothschild, Collar pad fastener, Coloring or waterproofing compositions, Combustion, apparatus for promoting, Corset, J. Stone, Corset shaping machine, Cotton scraper.