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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 This is for our information and not for publication.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.

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.

INDEX OF NOTES AND QUERIES.

(4050) H. W. G. asks: 1. Is there any preparation in existence which will produce oxygen gas? If so, what? A. No preparation known gives off oxygen gas without the application of heat to some extent in any practically useful way. 2. Also is there any preparation that will absorb carbonic acid gas, such as we eject from our lungs in breathing? A. Caustic soda, potash, or lime will do this. To absorb injurious organic matter, potassium permanganate is useful. Simple absorption of carbonic acid gas will not suffice for purification of air which contains products of respiration.

(4051) W. A. S. asks: Can you tell me what the actuating element is in the common form of metallic thermometer, and how used? A. A compound spiral of steel and brass. The differential expansion causes the rotation of the needle connected with it. It is the principle of the Breguet thermometer, described text books on physics.

(4052) O. P. asks: Will kerosene oil penetrate and rot rubber? And if so, is there any that can be prepared so it will not penetrate or rot it? A. Kerosene oil will have some effect upon India rubber, which will be more perceptible in proportion to the time of action. It cannot be prevented. A good quality of vulcanized rubber will be least affected.

(4053) J. M. U. de G. asks (1) for a cheap method of making hydrogen gas. A. Pass steam over white hot iron or copper contained in a tube. 2. How many cubic inches of pure hydrogen gas will it take to lift one pound avoirdupois weight? A. Allow for pure gas, 70 pounds to 1,000 cubic feet, or 14 feet to one pound avoirdupois.

(4054) O. S. E. says: I have laid some pressed brick which some white substance comes out of. I would like to know what causes it, and what will remove it and other stains from pressed brick. A. The white stains are chiefly due to the presence of salts of magnesia, and no satisfactory cure has as yet been discovered.

(4055) F. W. asks: 1. Does a cubic foot of lead weigh less at a depth of 10,000 feet than it does at a depth of 10 feet under the surface of the sea? A. The lead would weigh slightly less by the decreased gravity at great depths. 2. Which will reach bottom first of two balls, one weighing 100 lb., the other 1 lb.? A. The 100 lb. ball will get to the bottom first, because its weight is greater in proportion to its surface exposed to the friction of the water. 3. Is water harder to penetrate at the bottom or surface of the sea? A. The density of the water at the bottom of the deep seas is but very slightly greater than at the surface. At one mile in depth it is 1-130 more dense than at the surface. 4. Will a small stone or sand sink to a depth of three miles? A. All substances that will sink at all will go to the bottom of the deep sea. Sand, mud and shells are found there.

(4056) C. J. B. asks: 1. To what use is the metal palladium put? A. It has been used for graduated scales. It has very little use outside of the laboratory except as a constituent of alloys used for hair springs of watches. It is the base of a useful reagent and is used in gas analysis to absorb hydrogen. 2. What is its market value? A. It is quoted at $2 per grain. 3. To what extent is it used? A. In very small amounts. 4. Where is it found? And how extracted from the ore? A. In Russia, North and South America, native or as an alloy. It is extracted by solution in acid and precipitation and ignition. 5. Is the process cheap or costly? A. It is not very costly. An excelent article on the subject is given in Appleton's American Encyclopedia.

(4057) H. G. M. asks: Will loadstone hold its power of attraction if not interfered with? A. Yes.

(4058) O. W. asks: 1. Is the flickering in arc lamps caused by impure carbon or unsteady feeding apparatus, or if neither of them, what causes this trouble? A. Both; and also to variations of E.M.F. and current. 2. Is it necessary to connect arc lamps in series as in the Brush system? What size iron wire would be best for a resistance coil in a line where high voltage is used? A. Arc lamps are generally connected in series. The size of wire depends on the current. Iron has about six times the resistance of copper. 3. Did Wilde (the inventor of the well known Wilde dynamo-electric machine) ever take out a patent on his arc lamp, known as Wilde's candle, in the United States of America? A. We think not. 4. In his apparatus, while burning, the carbons stood side by side, and I should think the current would have jumped across the space near the metal carbon holders instead of going to the points of the carbons, which would throw in additional resistance in the circuit. What is the reason it did not? A. The carbons stand at an angle, the points being nearer together than the clamped ends, hence the resistance of the increased air space prevented the arc from running along the carbons.

(4059) E. S. F. asks: 1. How large a storage battery would be required to light one 10 candle power incandescent lamp for two hours? A. Supposing the lamp to be a 20 volt lamp, 10 or 11 cells of storage battery will be required to secure the necessary voltage; but this number is sufficient to run 10 such lamps. 2. How much would such a battery cost, and would you tell me how I could make one? A. For cost of storage batteries, address the manufacturers and dealers. For directions for making, consult SCIENTIFIC AMERICAN, vol. 61, page 22. 3. How much power can I obtain from a steam engine with piston 1¼ inch diameter, 2¾ stroke, with 50 and also 100 lb. steam? A. If the engine is well made, you would realize respectively ¼ and ½ h. p. approximately at a speed of 300 revolutions per minute.

(4060) B. I. T. asks whether there is any advantage or gain in wetting down the coal. Some claim the dry coal produces more heat, while others claim the wet coal produces most heat. A. The wetting of coal dust is for the purpose of holding it together and preventing waste by dropping through the grate. In this way more heat is obtained.

(4061) M. L. writes: I received your book "Experimental Science," and am well pleased with it. I am making the simple motor described in its pages, and would like to ask a few questions through Notes and Queries about it: 1. How many pounds of wire will be required for motor, when used either as a motor or dynamo with cast iron field magnets, using No. 18 for fields and No. 20 for armature? A. It requires about 2 lb. No. 18 and ½ lb. No. 20. 2. Should the wire be single or double covered? A. Double covered. 3. Will the above sizes of wire be light to be used on a dynamo circuit when placed in a shunt? A. It depends on the kind of current used. It would be right for a current of low voltage. 4. How many cells of the secondary battery described on page 418 in "Experimental Science" will be required to run the motor? A. Four. 5. If it requires a stronger current to charge the storage cell than it gives out, what advantage is gained by using it? A. Convenience and constancy. It can be charged at night and used during the daytime, and a stronger current taken from it for a shorter period than was used in charging it.

(4062) G. D. writes: I have taken the liberty of forwarding a sample of brown animal grease, which I am desirous of bleaching. A. Try following processes on it for purifying tallow: 1. Agitate with 5 parts good vinegar. 2. Agitate 50 parts tallow with 80 parts water and 12 parts salt. 3. Agitate 50 parts with 1 part calcined magnesia. 4. Agitate with weak solution of caustic alkali, or with strong solution of an alkaline carbonate. 5. Prolonged agitation with water. 6. Agitate 10 gallons with ½ gallon H_2SO_4 and ½ gallon water. In all cases apply heat during process and then wash, steam well, and remove last traces of chemicals.

(4063) J. W. C. asks where the gelatine-like composition used instead of glass for holding the film for plates is manufactured. Also is it a patented article? A. The compound is a mixture of gun-cotton and camphor, and is called celluloid. It is made by the Celluloid Company, Newark, N. J., under patents.

(4064) J. L. F. asks: What number cotton-covered magnet wire should I use to make a magnet of about 20 ohms resistance? Also how much of it? A. 4865 feet of No. 16, 1924·2 feet of No. 20, 761 feet of No. 24, 189·32 feet of No. 30, or 47 feet of No. 36. The size of the wire must be in proportion to the current to be carried.

(4065) L. A. P. asks: Is sewer gas odorless? By what chemical process can you detect sewer gas in a room? A. It generally has a depressing odor and usually contains sulphureted hydrogen. In the latter case it can be detected by paper dipped in lead acetate solution. It turns the paper brown. This is not at all infallible. It should be tried in the night.

(4066) A. J. O. writes: I desire to paint my roof with a coat of lead color instead of the customary red mineral paint. Some of my neighbors maintain that there would be danger of lead poisoning from such a roof. Will you kindly inform me if there would be any such danger? A. We should advise the use of ochers, graphite, or similar colors for roof painting.

(4067) J. D. H. writes: In relation to the induction coil described on page 548, "Experimental Science," allow me to ask the following questions: 1. Is it any advantage to varnish the layers of the secondary coil? A. Yes; but the advantage will hardly compensate for the trouble. 2. About how much more than one pound of No. 36 wire is called for? A. It requires nearly 2 lb. 3. Can I purchase platinum-pointed screws of electrical supply dealers? A. Yes; or you can easily insert the point yourself. 4. Are the contact points of the ordinary call bells protected with this metal, platinum? A. Usually. In the cheaper kinds, however, makers are apt to substitute silver or German silver, which are, of course, not so good. 5. Why does a condenser of a capacity of 75 square feet command such a high price, $20? A. They are carefully made and well mounted and protected, and besides this, the dealer must necessarily make a profit. 6. Should the sheets of tin foil in condenser for above mentioned coil be large or small? Does the size of sheet make any difference? A. The size makes no material difference, but they should not be too small. Make them of a size suited to the base of your instrument.

(4068) C. E. W. writes: 1. I made an induction coil *a la* Hopkins. Used two one gallon bichromates, made interrupter with platinum points, burnt out fast, made mercury breaker, worse than platinum, mercury vaporized, made condenser, 50 square feet tin foil, bunched together and wired as per directions; this made one-half; run a wire to neighboring tin roof for the other, thus electrically separating the two sections. Sparked as much as before, thought surface must be deficient, so run wire to water pipe, hoping all creation would furnish at least one-half the necessary amount, mercury kept burning up all the same. The books say the mercury breaker prevents the spark, at least decreases it, and the condenser helps considerably, and if I have two large metallic surfaces insulated from each other, why is not that sufficient? A. Try connecting your battery in parallel. Use kerosene oil or alcohol on the surface of the mercury in the contact breaker. Have it deep enough to always cover the platinum point. 2. Is it absolutely necessary that sheets of foil should be piled together in order to secure the best effect? If so, why? A. Yes; in order that they may act inductively on each other.

(4069) G. A. M. asks: 1. Does it hurt the meter or converter on an incandescent system to short circuit the wires? A. It depends upon the way the meter is connected in the circuit. 2. What is the current that is used to execute criminals at Sing Sing? A. A circuit including an E.M.F. of 1500 to 1700 volts. 3. Could an induction coil be made with No. 36 double-wound cotton-covered? If so, how much should be used for the secondary coil? A. Yes; it would take two pounds.

(4070) H. K. asks: How many cells of storage battery (such as described in "Experimental Science) will it take to run the motor in SUPPLEMENT, No. 641, also how many cells of gravity battery required to charge the same? A. It takes four cells of storage battery to run the motor, and four cells of gravity battery are required for each storage cell for charging.

(4071) A. C. W. writes: I have been trying to connect two buildings, about 1,300 feet apart, by two bells over one outside wire (No. 18 copper), using the ground as a return wire, so they will reply to each other. I have used three closed circuit, Crowfoot batteries at each end (5 x 7 inches), using 1 pound of blue vitriol to each jar. Used double contact buttons. The grounds are: One pipe about 4 feet long driven into moist ground filled with water, the other is a well pipe about 25 feet long. Can you tell me where I have made my mistake? A. You have probably failed in your grounds; they should have a much larger surface. We think a better plan would be to connect all the batteries together at one end of the line and keep the whole line normally closed, simply opening the circuit for signals. If the bells are of the vibrating style, you might make the bell ring by connecting it up on an independent local circuit with one cell. Then when the main line is open, the hammer will fall back and the bell will be operated by the local battery.

(4072) R. A. W. asks: 1. What is the best and quickest mode of polishing ornamental wood turning? Is it possible to mix a color with shellac to make the turned wood appear like mahogany and polish at same time? What process is used to put color on and polish articles such as lead pencils and ladies' toilet brushes and work boxes, such as appear enameled? A. For mahogany stain on light woods use an extract of cam wood. The stain is to be applied to the work while it is in the lathe. It is then removed and allowed to dry. Polish with shellac varnish to which has been added 50 per cent of boiled linseed oil, or better, use French spirit varnish in the same way. Apply with a cloth. For pencils and boxes a logwood stain is often used. The varnish is flowed on and often not polished. 2. Is there any book published which treats on polishing, wood turning, staining, and graining, etc.? A. You will find a great deal on wood stains and polishes in the "Scientific American Cyclopedia of Receipts, Notes and Queries," which we can mail you for $5.

(4073) A. S. asks (1) how to prepare the cloth for a small balloon intended to contain hydrogen. A. For preparing cloth for balloons see the SCIENTIFIC AMERICAN SUPPLEMENT, No. 726. 2. Can hydrogen be used in a balloon of India rubber? A. Yes; but hydrogen will always rapidly escape. 3. How many pounds will a balloon filled with hydrogen, and with a capacity of 1,000 cubic feet, lift? A. For 1,000 cubic feet pure hydrogen allow 70 pounds of lifting power; from this subtract the weight of your balloon and accessories. A liberal allowance should also be made for impurities, diffusion of gas, etc.

(4074) G. H. L. asks: 1. How can I make a cheap reliable air pump for experimental purposes, with a bell about eight inches high? A. For this we refer you to Hopkins' "Experimental Science," $4 by mail. 2. Have carbons been made to show different colors of light? Is it possible, owing to the great heat which they must undergo while carbonizing? A. To the eye the white rays will always predominate, although they have been caused in spectrum analysis to volatilize metals to give the characteristic flame. 4. Would colored carbons be in demand? A. We doubt if any demand would exist for such as could be made.

(4075) C. B. asks: 1. A formula reads "solution chloride zinc" (U. S. Ph.), 1 quart. What quantity of zinc chloride granulated does it require to make proper strength to quart of water, so as to be like above U. S. Ph.? A. For one quart of solution allow about 1 pound of the solid salt. 2. Solution chloride sodium (℥vj to O j), 2 pints. Does this mean 6 ounces sodium chloride to 1 pint water? A. We suppose so; it is not very explicitly stated. 3. Will arsenious acid 1 part, dissolved by using carbonate potassa, 6 parts, remain colorless or turn brown after standing? A. It should remain colorless. 4. What is the best way to make alum mix with arsenious acid solution and remain clear? A. Acidify if necessary with hydrochloric acid. 5. In making solution of bichloride mercury with muriate ammonia, should they be dissolved together in cold water or hot, or separately in hot or cold water? A. Dissolve both together, or the ammonia salt first. Warm the water, do not boil it.

(4076) H. J. S. asks: 1. Will you please explain the latest theory in reference to ventilation? A. The best method of ventilation is that in which the foul air is drawn from the upper and lower portions of the room and in which fresh air enters around the windows, doors, and other openings or through a number of small openings distributed around the room, but not located near the ventilating ducts. 2. Should rooms be ventilated at top or bottom of room or at both points? A. See answer above. 3. Can a school room be properly ventilated (that is not cooled off) by lowering the top of window only? A. Not properly; but this method, when draughts are not created, is better than no method. 4. Does carbonic acid gas settle to bottom of room or rise to top or is it diffused through the room generally when heated to ordinary living temperature, and are there any other gases deleterious to health, and how best to ventilate for them? A. Carbonic acid rises to the top of a room because it is always evolved in a heated condition. It then diffuses all through it. There are other gases and emanations from the body, as well as dust and disease germs, which are carried off by ventilation.

(4077) S. T. C. asks the difference between a square foot and a foot square. A. A square foot is any shaped surface that contains a square foot of area. A foot square is a square surface of the length of one foot on each of its four sides.

S. C. M. I. asks for a waterproof cement.—J. C. says: Will you please tell me how to repair the back of a mirror where the silvering has scaled off?—A. G. H. asks for a receipt for a good hard washing soap.—F. H. W. S. says: I wish a paint mixture for outdoor work on statues, that will stand weather and will neither fade nor turn yellow.—J. J. M. says: Do you know of any way I can get a formula for making a dressing for ladies' shoes?

Answers to all of the above queries will be found in the "Scientific American Cyclopedia of Receipts, Notes and Queries," to which our correspondents are referred. The advertisement of this book is printed in another column. A new circular is now ready.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

February 16, 1892.

AND EACH BEARING THAT DATE.

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

Acid, apparatus for concentrating sulphuric, C. Negrier	468,891
Adjustable handle for taps, reamers, etc., T. E. Avery	469,065
Advertiser, photoscopic, P. Ortega	469,171
Air brake, E. G. Shortt	469,176
Air cooling and purifying apparatus, I. F. Good	469,207
Arm, artificial, W. Boardman	469,115
Armature for dynamo electric machines, M. Deprez	469,080
Asphaltum, manufacturing, J. A. Dubbs	468,867
Atomizer, A. Howard	469,144

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