

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 This is for our information, and not for publication.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) G. W. asks a recipe for hardening soles of shoes. A. There is nothing practical for such purpose, except using nails or some such covering, as adopted in miners' shoes. Leather does not lend itself to any hardening process not already in use in its making.

(2) C. T. asks: 1. What is the strength of the solution of pure arsenic to be used for spraying fruit trees? A. If white arsenic is used, it is apt to injure the leaves. Mr. Gillette, of the Iowa Agricultural College, found that 1 pound arsenic to 400 gallons of water injured apple tree leaves, and 1 pound to 800 gallons injured plum tree and poplar tree leaves. Even 1 pound to 1,200 gallons affected plum trees. This is therefore the maximum strength, and is probably too weak to be of much efficacy as an insecticide. Recent experiments by Professor A. J. Cook, of the Agricultural College of Michigan, show that three applications of "London purple," 1 pound to 100 gallons of water, can be applied to apple trees. The foliage is injured, but the fruit ripens. We also refer you to SCIENTIFIC AMERICAN SUPPLEMENT, No. 475, for a valuable paper on the subject of destruction of insects on trees. 2. How can the disjoined column of mercury be reunited in a combined maximum and minimum thermometer? A. The column can be joined by jarring the instrument with the main bend downward. The method of filling is practically a trade secret.

(3) J. G. asks for the process of gilding letters (sunk) on marble. A. It is executed like other gilding; the letters are sized and the leaf is put on with a camel's hair pencil; the flat surface of the marble around the letters is rubbed off with cuttlefish bone.

(4) J. H. asks: What will keep plate glass windows from perspiring after lighting gas in show windows? I have tried almost everything without success. The windows are closed in the back with sliding doors, and have a 4 inch ventilating hole in the ceiling. A. Probably you have not a sufficient space at the bottom to provide for an air supply. A through draught is needed. Top ventilation alone is not sufficient.

(5) P. H. L. asks: 1. Why is the armature core of a dynamo made up of a series of iron washers insulated from each other by paper washers? A. To prevent currents of short circuits, which would otherwise be generated in the armature core. They are known as Foucault currents. 2. Could not a solid iron core be used instead? A. Yes, but it would be wasteful, as energy would be absorbed in the production of Foucault currents. 3. Is there any magnetism about a dynamo when not in motion? If not, what causes the magnetism in the field magnet, which the armature picks up and sends out through the wires? A. Yes; it is known as residual magnetism, and is the starting point for the action of the machine. 4. What is the best low priced book on construction of dynamos? A. Hening's Principles of Dynamo Construction. We can send it free by mail for \$2.50.

(6) Bookman asks: How can I remove ink stains from paper? I have a lot of second hand books and I want to remove the names from the front pages without defacing them. A. You will have much difficulty in doing it. Use oxalic acid dissolved in water, followed by javelle water. Hydrochloric acid dilute may be used to remove the iron stain left by old ink. We also refer you to SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 55, 158, and 471.

(7) P. S. asks: How much coal gas is made from 1 ton (2,240 pounds) of coal? A. 9,000 to 12,000 cubic feet.

(8) G. A. M. asks how to tell a genuine gold leaf gilt frame from one that is not. A. By scratching the surface. If the frame is silver-coated and varnished, the silver will show when the lacquer is scraped off. If of gold leaf, the body of the frame will appear. To one familiar with both kinds, the gilded frame can be recognized by its appearance.

(9) C. C. M. asks for receipt for making Saratoga chips (potatoes). A. Either lard or cottonseed oil can be used; the former is generally preferred. The potatoes are cut raw into very thin slices or spiral shavings. It is then a good practice to soak them for 10 or 12 hours in cold water. The lard or oil is placed in a deep pan and is brought to a good heat and the potatoes after draining are thrown in. The heat should be sufficient to make them "sizzle." When brown they should be removed with a perforated skimmer, and shaken in a cullender with a little salt. Experience is everything; the art is in knowing when to withdraw them.

(10) W. A. M. writes: I have constructed a static machine capable of giving a 4 1/2 inch spark. Can it be made to work the simple electric pen as described in back number of SCIENTIFIC AMERICAN, and how? I have tried several methods without success, as sparks pass through paper without perforating it. Placing the paper between electrodes separated an inch

or so, it is perforated nicely by the spark. A. The paper is undoubtedly perforated, but the rubbing of the pen may tend to close the minute holes. Try the effect of placing a piece of thick blotting paper under the paper on which you write. Possibly the underlying carbon plate is too smooth.

(11) A. D. W. writes: Lines drawn in the center of a 10 gauge double-barreled shotgun will meet at the distance of about 8 feet from the muzzle, and if continued to the ordinary distance of shooting, will be about 2 feet apart, i. e., the center of the pattern made by the left hand barrel would be about 2 feet to the right of center of pattern made from right hand barrel. As the facts do not substantiate the theory, will you please explain why? A. The barrels of a double-barreled gun are inclined toward each other because the sighting is done along the central rib. Possibly the gun you refer to is over-corrected. The recoil also not being axial tends to throw the gun to one side, varying with right and left hand barrel.

(12) G. H. A. asks (1) how to cut a glass jar in two. A. File a slight notch on side, hold a red hot poker against notch, and move poker back and forth until a crack is started, which you can lead in any direction by moving poker, which must be heated anew from time to time. 2. Will electricity affect a person's watch when they are taking shocks from an electromagnetic battery, and will it affect them as soon as the current is turned off? A. It will not in the sense you refer to. 3. How is the simplest as well as the cheapest battery made? A. For batteries we refer you to our SUPPLEMENT, Nos. 157, 158, and 159.

(13) J. C. L. asks (1) if a dynamo-electric machine armature 4 1/2 inches diameter, 3 or 3 1/2 wide, having three or four layers wound around its core, can be driven at 2,000 revolutions per minute. A. Yes. 2. Can you give me a formula or rule for determining it? A. No rule can be given; the speed named is within the limits determined by practice. 3. Is Russia sheet iron suitable for making the laminæ of an armature core? A. It is about the best material.

(14) P. D. H. asks for a good battery to work eight electric bells. A. Use four cells of the new Sampson carbon battery, in which a cup of carbon holds the black oxide of manganese instead of the usual clay cap. Employ a reliable electrician to test your wires for crosses and leaks. Brighten up the door connection by removing the dust from the surface of metal.

Enquiries to be Answered.

The following enquiries have been sent in by some of our subscribers, and doubtless others of our readers will take pleasure in answering them. The number of the enquiry should head the reply.

(15) At what speed can a housefly fly? -J. A. A.

(16) How can I prepare a good grafting wax? -R. W.

(17) Which bird flies the fastest, carrier pigeon, duck, or bullet-head hawk? Also, what is the fastest bird and its record? -J. G.

(18) How can I make a good violin varnish? A tender and at the same time wearable varnish. The color to be a blood red. Also, how can I find the tone a piece of wood gives? -C. C. M.

(19) Will you please inform me through your valuable paper if there is any mechanical device known that will propel itself until it breaks or wears out?

(20) Will you please tell me how maps in relief are made, such as are used in Germany and other countries in the schools? I understand modeling in clay and casting in plaster, but wish to make them of something that will not break so easily. -Halifax.

(21) 1. How are leather cuttings dissolved and prepared for further use? 2. What cement medium is used? 3. How are buckets, bathtubs, etc., of wood pulp made? 4. What is the substance besides wood pulp? 5. What cement medium is used? 6. How prepared to stand the moisture? 7. If pressed, what pressure is necessary? 8. How dried? I hope that you kindly will oblige one of your subscribers here in Norway by giving full information about above. It will no doubt interest many readers of your paper. -E. C. G.

(22) When is the best time and what is the best method of grafting pear trees? -F. F. B.

(23) Please let me know how to prevent limed eggs from cracking while boiling. And how to make old cider, two and three years old, quick to vinegar. The cider is placed in the yard about three months. About two weeks ago I added to each barrel two quarts of Porto Rico molasses. It has not changed yet. -H. J. B.

(24) What coating is used to preserve old maps made on paper with cloth backing (the usual mounted paper of draughtsmen)? The one I have begins to flake or peel off, showing that the paper is brittle. -D. H. Van A.

(25) What is the best way to get yellow stains out of ivory? And the best way to get stains out of marble? -H. L.

(26) How can cottonseed oil be bleached and refined to substitute the lard? And which are the proportions to use it as lard? -J. L.

(27) 1. If a Bell telephone receiver be required to work on a very short line as both transmitter and receiver, should the winding or the adjustment of the diaphragm be altered in any way? 2. How much wire, and of what size, shall I use in making a receiver to work on a circuit with a microphone transmitter? 3. Whether will a single or a multiple contact transmitter give the best results? 4. Where can I get instructions for making a magneto bell? 5. I want to make a cover for a carbon battery by melting some lead and casting it in the form of a plate in which one end of each carbon is to be embedded. Will the heat be apt to break the carbons (arc light carbons), and if so what would be a good substitute for lead? 6. Which

would be better for house bell and gas lighting—a carbon battery or a cell made of cast iron, zinc, and a solution of caustic potash, the cells being of the same size? -T. D. McC.

(28) Please tell me how to make a liquid ink eraser for both red and black ink. -J. K. McB.

(29) I have a C. and C. motor which has been changed to a dynamo. It is 1/2 H. P., 13 volts, 9 1/2 amperes. If I could, I would like to run it by a turbine wheel from a 5/8 inch pipe. I can get a pressure of 25 pounds. If you think that would run the motor at a speed between two and three thousand revolutions a minute, please tell me where I could get a formula for making such a wheel. If I could not run it that way, how many and what kind of cells would it take to run it as a motor? -C. F. D.

(30) Please tell me how to temper steel cutlery, such as daggers, Bowie knives, butcher knives, etc. -R. W. H.

(31) Please give directions for making an oxygen bag to use in connection with an oxy-calcium light for magic lantern. How can an amateur silver a copper or brass reflector? -H. P.

(32) Would paper placed between the tin and sheeting of a tin-roofed building prevent moisture from accumulating and dropping in the room where there is no ceiling in cold, frosty weather? -J. A. B.

(33) I wish to ascertain the best and easiest method of removing old lacquer from brass instruments. Also receipt for making aluminum lacquer, and other qualities, such as mathematical instrument makers apply to their brass instruments to take off the bright glaze. Also how to apply, if brass should be warm or cold. Give method or receipt to make various colors of lacquer. -"Rocky Mountains."

(34) 1. Is there any rule by which the size of wire for a given current may be found (say current to be 110 volts and 120 ampere strength)? Please give me the rule for finding size of wire for different currents if you can. 2. Why is it that the wire on the armature of a dynamo is smaller than the wire used for a line wire? I cannot understand how it can be kept from heating, when I take into consideration that it has to carry the full current of the dynamo. 3. What rule is followed in winding armatures for dynamos by which a current is to be produced, the E.M.F. of which is to be 110 volts? 4. Can dynamos be built so as to give currents of different amperes, and still have the same E.M.F. or voltage? -W. F. H.

(35) I have a Talbot "Dixie" portable engine and boiler, engine 5 x 8 cylinder. I want to run a small circular saw with it, but am afraid I have not much power to spare. Suppose I attach a sawmill mandrel direct to engine shaft, would I have any more power than by using a belt? About how large an engine using a belt would mine equal in power, and about how much could I saw in ten hours of yellow pine, using a 36-inch saw? The boiler is the "Dixie" pattern, with large, straight shell, with the firebox inside the shell. I want to change it to a tubular by taking out the front head, firebox, and tubes, and putting on a flush front and new tubes. Boiler is 33 inches diameter, 5 feet long. Would it furnish steam enough to run the engine? About how much power would the boiler have? -X. L.

(36) I am a regular reader of your valuable paper, and would like to have you answer a question in your next issue if possible. How are steel spectacle and eyeglass frames bronzed and blued? How must I go to work about it? How is it done by our larger factories, that the entire frame has the same shade, and that it will not wear off easily? -St. Louis.

(37) Oblige a subscriber by stating where the facts can be found touching the manufacture of leather without the use of bark. Some time ago I noticed in your paper an account of a plant in Germany where the industry was carried on. Do you think that there is any practical method by which an industry of this kind could be made to pay in this country? There are an immense number of hides shipped away to the Eastern manufacturers from this country, to come back as boots, shoes, harness, etc. The country is filling up, and it seems as if the manufacturing of articles for home consumption ought to be done nearer home, especially as the time is fast approaching when the population will be numerous enough to warrant it. -E. A.

(38) I have some jars which were used for electric bells. They are about 4 inches in diameter by 6 inches high. Can I use these for an incandescent lamp? And about how many of these jars will do for one lamp? And how should I make the battery? Please reply in next week's SCIENTIFIC AMERICAN. -T. D.

(39) Is there any method I can use in making press copies of writing to make the copies clear and distinct? I copy from ten to fifteen sheets at once, making a double copy of each, and am often troubled by copies being illegible. By answering the above through the columns of your paper you will greatly oblige. -J. F. A.

(40) Would you please let me know how a luminous paint could be made that would show distinctly under water? -Rubicon.

(41) 1. Can you give the formula of a mixture that will cause stumps to be consumed by fire? 2. Please give formula of mixture that will improve the color of maple sirup. 3. Give best process of filtering maple sap, before boiling, to take out filth. -L. D. A., Jr.

(42) Can you tell me of any colored powder liquid or chemical that will change liquid gas tar from black to red, or brown? Please inform me if you can. -A. F. L.

(43) When shooting from a rifle, why does the bullet always strike in a line with the top of the sights, instead of eleven-sixteenths of an inch below, as that is about the distance from the top of the front sight to the center of the barrel? -G. C. N.

TO INVENTORS.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

December 4, 1888,

AND EACH BEARING THAT DATE.

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

Table listing inventions and their patent numbers, including items like Adjustable screen, Air brake, Alarm, and various mechanical devices.