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 This is for our information and not for publication.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.

(3324) P. J. F. asks: 1. Please inform me where I can get a small 6 or 8 16 candle power dynamo substantially built, to be run with a 1½ horse power gasolene engine. What style would best suit my purpose? A. All the electrical companies make both small and large machines. Any direct-current dynamo would do your work. 2. Is it practical to run a dynamo with a gasolene engine, viz., would the power be steady enough? A. If the gas engine is provided with a heavy balance wheel or a countershaft with a heavy pulley upon it, it should run steadily enough for the purpose. 3. Can I get a book to give me the information wanted? A. The company furnishing the machine will give all needed instructions regarding its installation, etc. Wheeler's "Dynamo-Tenders' Handbook," price $1 by mail, is a good book for your use.

(3325) R. A. P. writes: Unexpectedly I have been placed in charge of a small electro-plating plant consisting of two nickel tanks and two copper tanks, one of which is the instantaneous method of copper-plating by boiling solution. Here lies my difficulty, as I do not know the chemical composition of the tank, and being compelled to use it constantly, I fear the solution will weaken unless I replenish it. Could you tell me the composition of that tank and also refer me to a book on electro-plating? Not an extensive treatise on the subject, but simply the gist of it. A. There are many formulas for both nickel and copper plating solutions which differ so greatly that we cannot even make a guess as to the ones of which you have charge. It is certain, however, that any solution will not keep up to its strength indefinitely. When the plates of the metals are used up the solutions will run down. We can recommend Watts' "Electrical Deposition of Metals," price $1.00 by mail. You will have to take some lessons in the electrical features of your work. You can get these in night classes in your city in the fall and winter.

(3326) W. T. H. asks: 1. Can you inform me where I can get iron plates suitable for making first-class permanent magnets 1-16 inch or less thick? I have been unable to find anything so far better than saw blade metal. I have heard of an imported metal in bars which is claimed to be the best to be had, but cannot get it in sheets or plates. I want the plates soft, and will temper them after shaping them. A. A permanent magnet cannot be made of iron. Iron will not retain magnetism. You must have the best of tool steel, or tungsten steel if you can get it. It was probably this of which you heard. You can draw the temper, work the bars into plates and temper again. The high grades of steel are hard when purchased. 2. What are the chemical peculiarities of the iron most desirable for permanent magnets? A. There are no chemical peculiarities different from any steel. The proper percentage of carbon must be present in the steel. If tungsten steel is used this metal is also present.

(3327) B. A. T. asks: Please tell me how to double the power of the electric motor described in the issues of the SCIENTIFIC AMERICAN for December 8 and 15. A. To double the voltage of the motor wind twice as many turns on the field. This will give about twice as much power.

(3328) C. D. C. writes: I see in our street light system a porcelain fuse block, with fuses inserted in the line leading from the main line to the converter. This fuse block dangles at the side of the pole, and I contend that it should be protected in some manner. How would you think the best way to protect it? A. Fuse blocks are usually put where they can be kept dry.

(3329) E. P. asks: Will you be so kind as to furnish or assist me in securing a list of the decomposition of metals, acids, alkalies and salts by electricity? Would like it so stated that I can produce the decomposition in volts and amperes so in that way I will be able to reach what I am looking for. A. The subject of electro-chemistry is a very extensive one. We have not space to print what you ask. We can furnish you with Lupke's "Electro-Chemistry," price $2.50 by mail; or Whetham's "Solution and Electrolysis," price $1.90 by mail. These books will give you a start in the subject

(3330) C. C. A. writes: I note in SCIENTIFIC of this date, Query 8281, your explanation of the statement that zinc in a water pail would keep the pail from rusting, although you have never tried the experiment. I have had the experience, and have sought, but never found, a reasonable explanation of the fact before. Eleven years ago I bought a tin water-pail which had two strips of zinc about one inch wide soldered across the bottom of the pail in the form of a cross. The pail had a printed label attached stating that it would not rust. I used the pail constantly for a well water-pail about six years, without any evidence of rust. Upon examination at the end of that time I found the zinc considerably corroded, and taking it to a tinner had two new strips of zinc put in same position as the old ones. The pail is in use to-day, with no evidences of rust whatever. Of course an ordinary tin-pail would not have lasted one-fourth of the time without rust holes appearing. I have been told that an electrical current was set up which prevented rust, which, while true as a generalization, was not a sufficient explanation of how it prevented rust. Your explanation explains, but I should think a loose piece of zinc in the pail would accomplish the same result. Will you please state in "Notes and Queries" if that is so? A. The necessary condition for the action of the zinc and tin to prevent the oxygen from reaching the iron is a good contact of the two metals. This can be best produced by soldering the zinc to the pail. If loose, a larger piece would be required, and the contact would become uncertain as the metals became tarnished, which is only another name for corroded. When this took place the action might even cease altogether. These pails and other articles are now made with the zinc mixed with the tin, so it is claimed, and the same result is gained. The surface presents the same appearance as that of any ordinary sheet of tin.

(3331) G. W. H. writes: I read some time ago of a fluid which was invisible on paper to the eye, but which when viewed under a colored glass (blue, or green, I think, but forget which) it was easily seen. Can you give me any information on the subject? A. There are a number of substances which may be used for this effect. The most common, perhaps, is quinine. Dissolve this in water, to which a little acid, hydrochloric, sulphuric, or even citric, has been added. Paper is wet with this solution in any desired figure or pattern. View the paper through violet glass. A deep, dense shade of glass is required. Other substances which possess the same property are eosin, æsculin, fluorescine and uranine. The property is called fluorescence.

(3332) G. H. C. writes: A cold storage firm in Boston finds that the electric incandescent lamps which they burn in their cold storage vaults last about half as long as those burning in the offices, which are, of course, of ordinary temperature. Can you explain this? A. We have not heard any instance like this before, and have no explanation to suggest.

(3333) C. de V. asks: 1. I made a large plunge battery from the pattern as described in the "Experimental Science." I am having trouble with the cells leaking. I want to inquire whether the battery would have the same effect if the solution was in a trough instead of so many apartments? A. The battery will not give the same effects in a single cell as when each pair of plates has a cell by itself. Study a text-book upon the topic, "Mode of Connecting cells in Batteries." 2. The bichromate solution is so short-lived—only three or four hours—and then it runs down. Is there some other solution that will last longer and give good results? A. The bichromate solution is the best known for such a battery.

(3334) J. M. A. asks: 1. How can I tell the positive brush on a dynamo by Fleming's Rule? Explain Fleming's Rule. A. By placing the hand as the rule requires and applying the rule carefully to the coil under the hand. Fleming's rule does not seem to admit of explanation. It is a direct statement of what is to be done in order to determine the direction of the current in a wire. 2. Give some good rule to find the positive wire on a dynamo. A. The best way to tell the poles of a dynamo is to connect the voltmeter to the wire and when right the index shows the fact. If you have no voltmeter, you can use one of the chemical methods. Prepare a solution of starch in hot water and add a little iodide of potassium. Saturate some blotting paper with this solution and apply the ends of the wires of the circuit to the paper an inch or so apart, while the current is on. The paper around the positive pole turns dark from the liberated iodine which discolors the starch. 3. Have you any SUPPLEMENTS or books on switches and switchboards that tell all about them? A. No. Such work is learned from the Fire Underwriters' rules and the practice of the contractors who install apparatus. The dynamo tenders' hand-books contain much useful information. We can furnish you Badt's, or Crocker's, for $1.00 each. 4. Give short explanation about rotary and static converters. A. A rotary converter is a motor dynamo whose armature receives a current of one sort at one end and delivers the other sort at the other end. At one end of the shaft is a commutator, at the other end are collector rings. If an alternating current is sent in by the rings a direct current may be taken off at the commutator. The armature coils are connected as in direct current dynamos to the commutator bars. The coils of the armature are tapped off at symmetrical points to the collector rings, according to the form of alternating current. A static convertor is an ordinary transformer of which the induction coil is the best known type. They are commonly in use for reducing the voltage of alternating currents from the street pressure to that in house lighting. 5. Have you any SUPPLEMENTS that explain the automatic telephone? A. No. 6. What causes dynamos and motors to reverse themselves; and what is the remedy? A. There are numerous causes for the failure of a dynamo to generate. See the hand-books referred to above, under question 3, for both causes and remedies. We are not aware that a motor can reverse itself, since it takes the current given to it and goes ahead.

(3335) E. E. P. writes: We purchased the second story of a brick building and made a lodge room of it, taking out the partitions. We have a room with 32 x 62 x 15 feet ceiling. There are four windows in each end, and 4-foot ventilator in the center of ceiling. The floor is maple. But the echo or rebounding sound which arises is awful. We can hardly understand anything that is said—this sound is so great. Can you give us any information what to do with it? A. You do not say so, but we infer that the room has a flat ceiling, and parallel straight unbroken walls. Such a room would echo very strongly. The floor has little to do with the trouble, except when the room is empty. When the room is occupied the people cover the floor to such an extent that there is little space for the sound to be reflected from the floor. The remedy for the walls is to cover them with hangings so far as practicable. Colored Canton flannel will answer the purpose, if no more expensive hangings can be afforded. The idea is to cover the walls as fully as possible with some soft and yielding material, hanging loosely so that it will not reflect the sound, but absorb it. Now for the ceiling overhead. You may be able to arrange some festoons from the central ventilator to the corners, sides, and other points, so that the sound waves will be intercepted and destroyed by the drapery. Colored cheesecloth answers very well for this purpose, and is to be had in a greater variety of colors than bunting, which would be equally good.

(3336) T. L. S. writes: Referring to your issue of July 13, "Notes and Queries," No. 8267, would like to ask how about palladium and hydrogen? In a book on chemistry the statement is made that a thin sheet of this solid metal will allow hydrogen to pass through it as a sieve will water. A. It is true that hydrogen will pass by a process of dialysis through a thin plate of red-hot palladium. We did not consider that this sort of action was intended in the former inquiry. The metaphor of water and a sieve seems to be rather strong for the case. The request was for some gas that would pass through metals like light through glass.

(3337) O. H. asks: 1. I wish to charge electric auto, made of bicycle described in SUPPLEMENT 1195. What winding and what dimension shall I make dynamo for charging? A. You require 50 volts pressure in the charging current. The dynamo of SUPPLEMENT No. 600, price ten cents, will do the work for you. 2. Does positive brush be connected with positive plate of battery for charging? How long will it take to charge the same? A. Send the current in the opposite direction from that in which it flows from the battery. 3. If motors were made twice as wide with same number of turns and size of wire, would it give twice the power? A. It would about double the e.m.f. of the current from the dynamo.

(3338) J. H. W. asks: 1. Can you inform me why Weber, in his theory of induced currents relative to the phenomena of diamagnetism, had to assume that such currents flowed in paths of no resistance? A. We do not think the theory of dia-magnetism, held by Weber and advocated by Tyndall, is held at present by scientific men. Tyndall's book is now to be reckoned as among ancient literature upon this subject. Its chief interest is historical. 2. Have the various papers that have been read before scientific societies ever been collected into book form? A. The papers read before scientific societies are published in the journals of those societies, if such journals are published. Journals like the SCIENTIFIC AMERICAN gather up the most valuable of these papers and give either in whole or in abstract the best of scientific literature of the day.

(3339) W. W. P. asks: Will you please tell me some method of determining accurately if a room or house is damp, and, if so, how damp? A. Salt is a good substance to test the presence of dampness. Every housekeeper knows that the table salt sticks together in a lump in damp weather. It will also do the same in a damp room. Chloride of lime will turn liquid in a damp place. The rapidity of the change will enable one to judge of the degree of dampness. We do not know any scale of dampness by which to determine how damp a room is. A room in which soiled clothing or shoes will mold may be considered very damp.

(3340) J. J. C. asks: Would you kindly give me some information in regard to magnets and their resistance? I want to make some magnets as follows: One 5-ohm with a ⅝ core 1⅝ inches in diameter and 3 inches long. What size wire must I use, and how much? One 10-ohm, one 15-ohm, one 20-ohm, all the same diameter and length as the 5-ohm. A. Wind the 5-ohm spool with 380 feet of No. 21 single cotton-covered wire. The size of wire for the 10-ohm spool, to fill it exactly, falls half way between No. 22 and No. 23. You can wind 310 feet of No. 22 and 250 feet of No. 23, and have 5 ohms, of each, soldering the junction and covering it with tape. Or wind double the length of either, if you have only one size on a spool. For the 15-ohm spool the same is true. Wind 250 feet of No. 23 and 195 feet of No. 24, or wind double the quantity of either. For the 20-ohm spool, wind 195 feet of No. 24 and 165 feet of No. 25, or wind double the quantity of either. It is not usual to insist that the spool of a magnet must be filled with the wire. We should use the finer of the two sizes given in each case and fill the rest of the space on the spool with paper.

(3341) R. M. H. asks: 1. How can I convert the pure silver deposited on the bottom of the jar of the silver chloride cell described in the last edition of "Experimental Science" into sticks of chloride of silver so that I can use it in the cell again? A. The best way is to sell the reduced silver and buy new silver chloride sticks. It is not a simple matter to prepare the sticks. 2. Have you any supplements relating to the making of and using a portable testing set? A. SUPPLEMENT No. 1215 contains plans for a voltmeter and ammeter; price ten cents by mail.

(3342) L. C. asks: 1. I have a small direct-current motor with a bar-commutator. It runs on about 4 volts. If I substitute rings for bars on this commutator, can I run it with resistance on an alternating-current lighting circuit? A. Yes, but the resistance will need to be considerable. Take resistance enough to carry the amperes of the motor without heating and then adjust the resistance with the motor in series with the resistance till the motor runs at the proper speed. An equivalent choke coil or a small transformer would be more economical. 2. Will you please tell me if a 110-volt lamp would lose much brilliancy when run on a 104-volt circuit? A. Yes. 3. In the Nernst lamps in use in the Westinghouse Electric Company's exhibit at the Pan-American, iron wires in glass tubes are used as resistance after the light-giving portion of the lamp has been brought to incandescence. Why wouldn't these iron wires become heated and melt, as in the old, wire-filament incandescent lamps? A. Because the amount of current is not sufficient to melt the iron. The resistance of the lamp is high.

(3343) F. F. asks: 1. Is it the voltage or the amperage that burns out an incandescent lamp? A. Both the volts and the amperes are concerned in the action of an electric current. The volts furnish the pressure which overcomes the resistance and forces the current to pass. In a certain sense it is said that the volts furnish the shock when a person comes in contact with a live wire. But in this case the action is the same as above, the amperes flow through the body of the person and injure him by their action upon the tissues of the body. In the incandescent lamp too high a voltage forces too much current through the lamp and the filament is burned out, or, rather, dissipated, and lodges upon the glass, blackening it. 2. Do you know where I could get the necessary information to construct an alternating-current voltmeter and ammeter? A. We have not published the plans of such a meter. 3. When a rheostat is used on a dynamo does it lower the voltage or the amperage? A. The rheostat increases the total resistance of the circuit and therefore reduces the amperes flowing, if it is used in the line or external circuit. On the other hand, if it is a field rheostat, it changes the field resistance and thus allows more or less amperes to flow around the field. This changes the magnetism of the dynamo and thus changes the voltage of the machine. 4. I want to construct a dynamo for 15 lamps. Could you tell me how to enlarge the castings in SUPPLEMENT No. 600 so as to give the 15 lights? A. You would better get a dynamo already designed for 15 lights. About one kilowatt will do it. 5. In "How to Build Dynamo Electric Machines," by Ed. Trevert, he describes a 20-light Edison dynamo which has 20 pounds No. 23 wire on the field and 8 pounds No. 15 on the armature at 2,200 r.p.m. It gives 80 volts. How can I change it for 50 volts? A. Run the machine slower. It would be better to get a machine nearer what you need. It is not the best way to buy something and "fix it over." Go into the market and get what is adapted to your needs. 6. Have you a SUPPLEMENT describing an alternating fan motor? A. No.

(3344) R. V. asks: 1. How do you find the watt-output if you know the voltage and amperage of a battery? A. Multiply the volts by the amperes. 2. Could the primary and secondary of an induction coil be magnet wired? A. They should be. 3. Does it make any difference if common or magnet wire is used in the armature and field of a motor? A. Yes; use magnet wire. Magnet wire is common wire wound with cotton to insulate it.