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 This is for our information, and not for publication.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) E. F. S. asks: 1. How much iron wire does it take for armature for simple electric motor described in SCIENTIFIC AMERICAN, No. 11, March 17? A. About 2 pounds. 2. How far apart should the zinc and carbon be in batteries? A. One-quarter of an inch. 3. What is the distance between the parallel parts of the field magnet? A. One and three-eighths of an inch. See SUPPLEMENT, No. 641.

(2) B. L. asks: Will you please to tell me what will prevent, counteract, or destroy electricity in wool during the process of drawing and spinning into yarn, and also what will counteract the attraction between the roller and wool in the same process? The rollers are of wood and covered with leather. A. If practicable, keep the room damp, either by sprinkling the floor or hanging up wet cloths around the machine. If you cannot do this, you will probably be obliged to substitute metallic rollers for your leather covered ones.

(3) W. H. T. writes: 1. I wish to make a small electric motor, half the size of the one described in the SCIENTIFIC AMERICAN of March 17, 1888. Please inform me through your valuable paper, the SCIENTIFIC AMERICAN, how I should proceed. Should I have 6 or 12 coils in the armature? A. 12. 2. How many layers and convolutions should I have in each coil of the armature? A. Same as given in the article referred to, that is, 4 layers and 8 convolutions in each layer. 3. How many layers in the field? A. 5. 4. The size of wire to be used, 16 or 32? A. Use No. 20 on the field magnet and No. 24 on the armature.

(4) F. Van D. asks: 1. Would it affect the power of the motor to use common sheet iron instead of the Russia iron? A. No. 2. How many cells of 1 pint each of simple plunge battery, described in the issue of August 20, 1887, page 116, would it take to give power enough to run a sewing machine? A. The simple plunge battery is too small for use in connection with the motor. You could, however, run a sewing machine by the employment of a large number of such batteries, but it is advisable to use a larger battery.

(5) A. L. S. asks: 1. Would the hand power dynamo described in No. 161 be powerful enough to run one or more 16 candle power incandescent lights? A. It will not run a 16 candle power lamp. It will run a 6 or 8 candle power lamp of low resistance. 2. Would the motor described in 641 be sufficient to run the dynamo? A. No. If it were large enough to run it, the current generated by the dynamo would be less than that required to run the motor.

(6) F. A. T. writes: 1. In regard to batteries of small electric motor, described in your issue of March 17, 1888, would a number of carbons, 2 x 6, such as are used in the Leclanche battery, do, if say four were connected for each cell? A. Yes. 2. Does the zinc have to be pure? I have the motor almost finished, but cannot procure the carbons, 6 x 8, or zinc, here. A. It should be pure to secure the best results, but impure zinc will answer if well amalgamated.

(7) H. Y. Z. writes: In the SCIENTIFIC AMERICAN SUPPLEMENT, No. 641, you describe an electric motor. I wish to reduce the linear measures one-half; in doing so would it be advisable to reduce the number of coils on the armature to 6, also what size of insulated copper wire to use? A. The number of coils on the armature should remain the same. Use No. 18 wire on the field magnet and No. 20 on the armature.

(8) W. E. asks: If the dimensions of the simple electric motor be doubled, with what size wire should the armature and magnet be wound to give proportionate results? A. Use wire of the same size all around, and connect the conductor of the halves of the field magnet in parallel.

(9) L. M. W. asks: Can the "Simple Electric Motor" described in the SCIENTIFIC AMERICAN of March 17, 1888, be driven as effectually by a Bunsen's constant battery as with the plunge battery mentioned in the article? If so, how many elements will it need, and should the elements be coupled so as to make a quantity or intensity battery? A. The motor can be driven by a Bunsen battery by connecting the cells up in parallel so as to produce a quantity current. The best arrangement can readily be determined by experiment.

(10) A. W. N. asks (1) how to connect the motor described March 17, so as to make it a dynamo. A. The connections are the same for the dynamo as for the motor, but you should make the field magnet of cast iron, and wind the armature with fine wire, say No. 20. 2. What would be the power of it as a dynamo? A. No experiments have been made to determine this. 3. How can I make it so that I can run it either way at will? A. By providing two sets of brushes oppositely arranged with respect to each other, and mounted so that you can bring either set into contact with the commutator. 4. Will common stove pipe iron do for the magnet? A. Yes.

(11) W. C. P. asks: 1. Can the simple electric motor be used as a dynamo? If so, how will its power compare with the dynamo described in SUPPLEMENT, No. 161? A. Yes; see recent back numbers of SCIENTIFIC AMERICAN. 2. You say that the battery used to drive the motor will become exhausted in three or four hours. Do you mean that it will be necessary at the end of that time to put in new zincs as well as new solution? A. It is the solution that becomes soon exhausted. The zincs will last for some time.

(12) E. M. C. writes: In small induction coils, such as used in pocket batteries, what is the size and how much wire is used to produce the best effects, for both primary and secondary coils? A. Make the core of the induction coil of a bundle of fine soft iron wires. Its diameter should be three-eighths of an inch, its length 3 inches. Insert it in a thin spool of paper or wood, and wind upon the spool 2 layers of No. 20 insulated wire. Cover this primary coil with one thickness of writing paper, then wind on 10 layers of No. 36 silk covered wire. You can modify the current by slipping a brass tube over the exterior of the coil.

(13) A. L. F. asks: 1. What would be dimensions of steel bar magnet and helix of sufficient power to operate an electro magnetic bell in place of galvanometer as shown in Fig. 2, page 233 current number? A. An ordinary relay magnet and a 6 inch horseshoe machine magnet will do it. 2. Why are permanent magnets generally made of flat steel? A. Simply for convenience. 3. About what proportion of power could be transferred from a permanent magnet by means of a helix, to an electro magnet connected in same circuit? A. Only a small amount of power can be transmitted in this way.

(14) J. C.—The botanical specimen which you send to be named is a lichen, sometimes popularly called "tree moss," or "tree hair." Scientifically it is known as *Usnea barbata*. It is very widely distributed, growing from Mexico to Canada, and far northward. It has no commercial or other value.

(15) W. M.—For latest form of lime kilns, see SUPPLEMENT, No. 572.

(16) C. E. K. asks: I am building an electric telephone on which I have to use an induction coil. Can I not use a smaller and a more simple one than described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 569? A. Make a core 3 inches long and ⅜ inch in diameter of No. 20 annealed iron wire. Wrap the core with two thicknesses of writing paper, wind on the core four layers of No. 20 magnet wire for the primary coil, cover the primary coil with one thickness of writing paper, then wind on ten layers of No. 38 silk-covered copper wire for the secondary.

(17) G. L. writes: I have made a single cell Grenet battery, but it does not keep its power more than two weeks, therefore, I would like to make a single cell battery that will last longer and have more power. A. We know of no battery giving a strong current that will remain in good condition for more than two weeks. The Grenet battery is more readily renewed than any other capable of yielding the same current.

(18) W. R. asks: 1. In making the electric motor described in SUPPLEMENT, No. 461, only half size, for instance the field magnet only 5 inches instead of 10 inches, and so on, what size of wire should I use for armature and field magnet? A. Use No. 20 wire. 2. How many coils do I want of such? A. Use 12 coils on the armature.

(19) T. F. W. writes: I am mining a little, and have some copper plates that have been silver plated, and now the plating is partially wore off. The question is, is there any kind of solution that will answer for dressing the old plates, so that the verdigris will not show on plates? A. The plates you refer to are probably the amalgamated plates used for collecting small particles of metal. Such plates are usually coated with quicksilver. You can recoat them by washing them over with a mixture of dilute nitric and sulphuric acid, afterward sprinkling on a little mercury and rubbing it around.

(20) C. E. H. asks: How will I have to wind the armature and field magnet so that it will run from the power given to a 16 candle power incandescent lamp by a Westinghouse incandescent machine? I have tried to run it with this power. The first time I tried it, it gave about ⅓ horse power, in fact it was as much as I could do to keep it steady, but since then it will not go at all. What is the reason? If it cannot be made to run by this power, how can I make a storage battery that will run it? The current to store to be obtained from the Westinghouse incandescent light. A. It is probable that the insulation of your armature is burned so that the machine is short-circuited. You should use a lighter current. You can arrange this by placing your machine in a shunt. For information on making storage batteries consult SCIENTIFIC AMERICAN SUPPLEMENTS. See catalogue, which we send you.

(21) A. M. asks: 1. Can the sleeve, A, of the commutator of the 8 light dynamo described in SCIENTIFIC AMERICAN of April 30, 1887, page 278, be made of either iron or brass? A. Yes. 2. Can the collar, D, be made of wood or leather? A. The collar might be made of hard wood, but we fear it would not be durable; leather would not answer, as it would readily burn. 3. Can the commutator cylinder, E, be made of brass? A. Yes, but brass would last but a very short time. 4. Can the brackets (which are fastened to the field magnets, and receive the armature shaft) be made of brass? A. Yes, but it is neither so rigid nor so durable as bronze. 5. What properties must a current possess to produce an arc and incandescent light? A. The current to produce an arc light should have an electromotive force of at least 50 volts. Incandescent lights can be adapted to currents of either high or low voltage. 6. Does it require a greater current strength to raise a platinum wire to incandescence in open air than it would were it in a vacuum? A. No. 7. Do you know of a good cement for cementing glass and vulcanite? A. Equal parts of gutta percha and pitch melted together.

(23) A. M. M. writes: Having read your recent articles "How to Make a Simple Electric Motor" with a great deal of interest, I would like to have answered through your column devoted to such Notes and Queries the following questions: 1. What will it cost per hour to run 8 cells 5 inches by 7 inches plunging bichromate battery? A. We have at present no data which will enable us to answer this question. It would, however, probably cost from 10 to 15 cents per hour. 2. Is such a battery of sufficient power to run a small canoe? A. Yes. 3. What size propeller would be best? A. About 6 inches.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

April 24, 1888,

AND EACH BEARING THAT DATE.

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

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