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 This is for our information, and not for publication.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. C. asks: Would the carbon, made as described in SCIENTIFIC AMERICAN of April 23, 1887, page 266, question 2, do to run the motor described in No. 11, current volume? A. Yes. 2. If so, how large should the carbon be for one large cell, sufficient to give the motor one man power, using the following mixture, which I copy from the *Electrical Review:* "Dissolve common soap in boiling water, and add to it small quantities of bran and caustic potash or soda. The mixture forms in the manner of jelly, and will not readily spill." I wish to attach the motor to a vehicle and any liquid will easily spill. A. The motor is not adapted to a single large battery. As we have never seen a practical trial of the soap and caustic potash battery, we are unable to say anything as to its merits. 3. Is it best to have one large cell or a number of smaller ones? If it is best to have small cells, how many half gallon or quart cells will be required to run the motor? A. It will require about 8 cells of plunging bichromate battery, with zincs and carbons 5 x 7 inches.

(2) P. J. N. writes: Will you please inform me what form, whether round, square, or twisted, is best for lightning rods? Also, what material is best? Would it be well to join all the bottoms of the rods, say 4 or 6 rods, to the galvanized two inch pipe of a drive pump, forty feet deep in earth? A. The form of lightning rod is immaterial. Copper is thought to be best. Iron rods of double the diameter of copper have the same capacity. The drive well would form a very good ground, but the surface is rather small. We would advise the use of several grounds consisting of plates of copper buried in moist earth, or of beds of coke having the ends of the rods looped and laid back and forth upon the coke bed, with a covering of coke above the rods. The coke should, of course, be in contact with earth that is always moist.

(3) S. W. C. writes: 1. Are there not some discrepancies in the description of the simple electro motor described in your issue of March 24? For the armature you say to use 12 coils of No. 16 wire, four layers in each coil, and eight convolutions in each layer. This would require 96 convolutions of wire in the circumference of the armature, and as No. 16 insulated wire measures 0·066 (over the insulation), there would have to be about 6⅓ inches in which to wind the 12 coils. Now, the inside of the armature, when wound, would be only 1¾ inches diameter, or about 5½ inches in circumference, and therefore could not contain the required number of convolutions. A. Armature may be filled with No. 16 single covered magnet wire, if carefully used, but it is difficult to wind the armature with wire of this size in such way as to get the wire all in. The resistance of the armature is increased somewhat by using finer wire, but owing to the facility with which No. 18 can be wound, it is, perhaps, advisable to use that size instead of No. 16. 2. It is stated that each coil requires about 30 feet of wire. As there are 32 convolutions, and only about 6 inches in each convolution, I do not see how there could be more than about 16 feet. A. There was an error in giving the length of this wire. The length is about 15 or 16 feet.

(4) H. R. S. writes: In winding the armature, I am using double covered No. 16 wire, and after winding six coils as described, I find that I shall not have room on the armature to wind the other six coils with eight convolutions. Would the motor run all right if eleven instead of twelve coils are used, or would it be better to wind the remaining six coils with seven convolutions? I saw in the last issue of your paper that if the coils were wound with unequal lengths of wire, that the motion would be irregular. To what extent would be the irregularity of motion, in either of the above cases? Is there any other way than that I have stated, besides rewinding, of overcoming my difficulty? In case I should wind the remaining coils with seven convolutions, should I decrease the amount of wire on the field magnets? In running a sewing machine or lathe, what inconvenience would the irregularity of the motor cause? Would the irregularity be enough to be noticeable in the lathe? A. By using single covered wire you will be able to get in the required number of coils. There will be no particular objection to using No. 18 instead of No. 16, if you find your ring too small to receive the No. 16. Slight irregularities of winding, such as you mention, would not have a very serious effect upon the operation of the motor. There will be no observable irregularity in the rotation.

(5) Montana wishes to know if there is any limit to the height a siphon will work, provided you can get the water started. A. Theoretically, the limit of the action of a siphon is 33 feet high, but practically, only about 26 feet is realized.

(6) G. I. H. asks (1) if the field magnet of the electric motor described in March 17 number of SCIENTIFIC AMERICAN is to be of one piece of Russia iron, or of different pieces, and if of one piece, where can it be obtained? A. It is unnecessary to make the field magnet of a single piece of Russia iron. The strips should be as long as you can conveniently procure. The ends of the strips may be simply abutted. 2. Is any of the wire to be cotton covered, except for winding the armature? A. All of the copper wire used in the construction of the machine must be insulated. Single covered magnet wire will answer.

(7) H. C. S. writes: I am trying to make a motor like one described in No. 11 of SCIENTIFIC AMERICAN. I find that I cannot wind twelve sections, eight wires wide and four deep, of 16 cotton covered wire. In Mr. Hopkins' directions he says it takes only 30 feet of wire on each section of the armature. What is the cause of the trouble? I find it takes only 16 feet to the section. A. Your inability to wind on the required number of convolutions and layers of wire in the sections of the armature is probably due to one of two causes, or perhaps both. You may have used double or triple covered wire. The wire in the armature illustrated is No. 16 single covered magnet wire. You may have failed to lay the wire straight and truly parallel. The way out of the difficulty is to omit one convolution from each of the last two layers of wire in each coil, or wind the armature with No. 18 wire. The latter plan is preferable. You are right in regard to the length of wire in each coil of the armature. It was erroneously given as 30 feet. It should have read 15 to 16 feet.

(8) S. J. A. writes: I have wound my field magnet with wire which I bought of the Detroit Electrical Works for No. 16 insulated. Now I find after one coil is on the armature ring, I cannot get the second in its proper place, the first being too wide. I used four layers, 8 wires wide. What shall I do? Use smaller wire or a less number of convolutions? I have my field magnet all wound, and don't know what to do. A. See answer to H. C. S.

(9) R. M. S. writes: I am making an electric motor as described in SCIENTIFIC AMERICAN issued March 17. In the bill of dimensions and quantities, I find I cannot get 30 ft. in each coil on the core. It is specified 4 layers in each coil, and 8 convolutions in each layer. What I wish to know is, is the effectiveness of the motor governed by the proportional amount of wires in armature to the field magnets? If so, does lengthening or shortening the wires in the coils make the motor stronger? I find by actual trial that 15 ft. will fill each coil, thus shortening just one-half. A. See answer to H. C. S.

(10) W. C. F. asks: 1. Would it be well to use a motor run by batteries to run a dynamo to produce light? A. The use of a motor run by batteries to operate a dynamo to produce a light is very much like pumping water by hand to operate a water wheel to run a grist mill. Better use the current from your battery to operate your lights, as you will lose more than half of it in the process you describe. 2. Would the motor of SCIENTIFIC AMERICAN, March 17, 1888, run the small dynamo of SCIENTIFIC AMERICAN SUPPLEMENT, No. 161? If not, how could the dynamo be changed? A. The motor referred to would not run the dynamo to any advantage. The dynamo could not be changed so as to be run advantageously by means of the motor.

(11) B. F. S. writes: I was much interested in an article headed "Simple Electric Motor," in SCIENTIFIC AMERICAN of March 17, 1888, and have begun the construction of one. The battery is the point I am in doubt about. The article says, eight cells of plunging bichromate battery, each having one zinc plate 5 x 7 inches, and two carbon plates of same size, will develop enough power, and run an ordinary foot lathe or two or three sewing machines. Does this mean Fuller's mercury bichromate battery or the Grenet battery? Can you refer me to any number of your paper in which I can get a description from which to construct, at moderate cost, a suitable battery to run this motor? A. The battery is of the Grenet type. We have not described a battery of exactly this construction, but expect to do so at an early day.

(12) G. M. C. asks: I want a cement that will bind (1) a strip of rubber, (2) a strip of rough dressed leather to a strip of steel same size, about 14 inches long, and in other dimensions about like the whalebone that goes in a corset. The cement to be firm enough to hold, despite active and frequent motion like that employed in laying on the rod. A. Use a cement composed of equal parts of pitch and gutta percha, with the addition of a very small percentage of some fixed oil—lard oil for example.

(13) W. D. L. asks: 1. Would you please inform me if the small "Electric Motor" described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 641, would require an electric current of a strength which would make it dangerous in the hands of an inexperienced person? If not, why? A. The current required for the motor is not at all dangerous. 2. Also would the prepared hektograph ink to be had in stationery stores give the same result as that of the formula for use on the copying pad described in the SCIENTIFIC AMERICAN SUPPLEMENT, No. 438? A. The prepared ink will answer the purpose.

(14) H. S. P. writes: 1. I have a one horse power engine in our coffee roasting department. Can I use the small electric motor recently described in the SCIENTIFIC AMERICAN as a dynamo, by connecting it to line shaft and driving it with the engine? Could I develop enough electricity to make one or more small incandescent lights? A. By using a cast iron field magnet and winding the armature with finer wire you will be able to produce a current that will run one or two small lamps. 2. Can I procure a number of your paper in which there is given a description and illustration of a plunging bichromate battery? A. We shall at an early day publish a description of a plunging battery.

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April 10, 1888,

AND EACH BEARING THAT DATE.

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