(4339) A. B. writes: 1. I have an induction coil of about the size of the one described in "Experimental Science," which is, however, wound with No. 32 silk-covered wire straight across the spool to a depth of about three inches, each layer being separated by two thicknesses of paper well shellacked. It gives a three-eighths inch spark, and will give no longer spark with double the amount of battery. A. By your mode of winding you have removed the outer layers of the coil too far from its magnetic center; furthermore, the wire you have used is too large; but taking the coil as it now stands, you would probably get a better result by connecting your cells in parallel. 2. Which is the most injurious to life—a current with one ampere and 600 volts, or a current of one-half amperage and the same voltage? A. The voltage being the same, the larger the current the greater the danger. 3. Is it more economical to conduct a five-ampere current with an E.M.F. of 100 volts than with 75? A. More economical in the use of copper. 4. Does anode mean the positive and cathode the negative pole? A. Yes. The anode is the electrode through which the current enters, and the cathode is the one through which it emerges. 5. What is the price of platinum per gramme? A. Sixty cents.

(4340) R. A. W. states that a Sawyer-Mann 16 candle 50 volt lamp requires one ampere instead of one-half ampere, as stated in Notes and Queries some time since.

(4341) R. W.—For the information you desire concerning solar printing we refer you to Wilson's "Photographics," price $4.

(4342) E. A. asks: 1. How can I connect two dynamos together to increase the voltage? A. Connect them in series, as you would two batteries. 2. How can iron be soldered? A. Iron may be soldered with soft solder by first tinning it, after the application of chloride of zinc or soldering fluid. Wrought iron and steel may be brazed. Use borax for a flux, and spelter, sheet brass or silver solder for solder.

(4343) F. M. G.—In the construction of your dynamo, the use of gas pipe for the core of the armature is a mistake. The capacity of the machine could not be stated without experiment.

(4344) W. C. G. writes: 1. I have made a telephone described (Fig. 5) in SCIENTIFIC AMERICAN December 14, 1889, but cannot get satisfactory results, and would like to know: If a larger spool and more wire (No. 36 s. c.) were used than what is shown in diagram, would it interfere with the working of the instrument? A. Too much wire would interfere with the working of the telephone by introducing unnecessary resistance into the circuit. 2. What effect would a smaller amount have, or if the quantity on each spool was not exactly the same? A. Too little wire would produce only a slight effect. If the two spools were of nearly but not exactly the same resistance, there would be no perceptible difference in the working of the line. 3. Would it make a difference in the working of the instrument if the "positive" end of each magnet was placed on the pole of each telephone, or should the "positive" end be placed on one pole and the "negative" one the pole in other? A. It makes no difference which pole of the magnet is used. 4. Should the instrument be connected by the screws P of each instrument, or by the screw P of one and Q of the other? A. This is immaterial. 5. Would a straight, pointed magnet 3 or 4 inches long answer in place of the U magnet? A. Yes. 6. What kind of steel should I use to make a straight magnet, and would it be as permanent as the U magnet? A. Any steel that can be hardened. Machinery steel is often used for this purpose. 7. In what number (SUPPLEMENT or SCIENTIFIC AMERICAN) is the "House" telephone described? A. The "House" telephone is described in No. 20, vol. 55, of the SCIENTIFIC AMERICAN, page 303. 8. In what number is the description of an induction coil, illustrated, for shocking purposes? Not an intricate affair, but what would give a good shock and such that one could make without machinists' tools, etc.? A. Such a coil as you mention is described in SUPPLEMENT, No. 569. 9. Would two thicknesses of paper between the magnet pole and coil be sufficient? A. Yes.

(4345) W. W. L. asks: 1. What is the resistance of a 16 candle power Edison incandescent lamp? A. About 220 ohms. 2. How many amperes would flow into a storage battery connected with the Edison incandescent light wire (E. M. F. 112 volts) with four 16 candle power lamps connected in circuit thus:

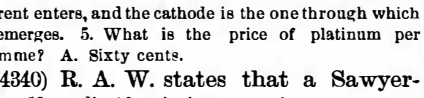

FIG. 1.

A. 0·012 of an ampere. 3. How many amperes would flow into battery with one, two, three, or four 16 candle power lamps connected in circuit thus:

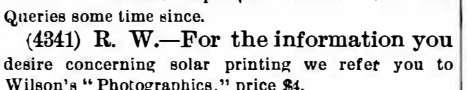

FIG. 2.

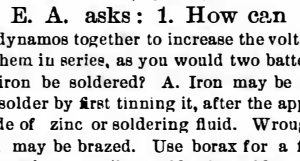

FIG. 3.

A. As shown in your diagram, Fig. 2, the amount would be limited only by the mains and service wires, as no resistance is interposed between the dynamo and battery except the conductors. You can connect the lamps in parallel in the manner shown in the third diagram. Then assuming the E.M.F. to be 125 volts, 2·27 amperes would flow through your battery. 4. What is the name given to the way the lamps are connected in each of these illustrations? A. The lamps in Fig. 1 are connected in series, those in Fig. 2 in multiple arc or parallel, and those in Fig. 3 in multiple series.

(4346) W. G. C. asks: Is there any way I can remove the bottom of a green glass bottle so as not to destroy either piece, and leave the edges so they can be stuck together again? A. You can cut off the bottom of the bottle by using a curved hot wire, turning the bottle in the wire so as to cause it to heat on a circumferential line. It is well to scratch the bottle with a sharp file at some point in its circumference to start the fracture. If the bottle does not break, a drop of water applied to the scratch will generally start the crack.

(4347) E. R. H. asks: 1. What is the nature of the so-called Foucault current? A. They are currents generated in the core of the armature and field magnet by induction, in the same manner as those generated in the wire of the armature. 2. How does a laminated core promote the cooling effect in an armature core? A. Laminæ, with the insulation between the laminæ, prevent the circulation of these currents and thus prevent heat. 3. Are armature cores and field magnets wound mathematically correct with regard to the size and length of wire? A. They are practically correct; a formula has been devised which would render it possible to design a dynamo by mathematical calculations alone. Many of the formulas in electric work are impracticable. 4. What is the limit of speed in a low-speed dynamo? A. It depends on the design of the dynamo; a dynamo may be constructed to generate a current at almost any speed.

(4348) A. L. D. says: What papers or books do you publish that will give me information on the construction of an incubator, and also what works could I get to instruct me in photo-engraving process work? A. For incubators see SUPPLEMENT, Nos. 612, 630, 778, 835. Regulator, 848. For photo-engraving, see SUPPLEMENT, Nos. 612, 731,768, 849, 656.

(4349) W. F. A. asks for a simple test for iron in sal ammoniac. A. The color will show it, if in quantity. Dissolve in water and add a drop of nitric acid, boil, cool, and add solution of potassium ferrocyanide or sulphocyanide. The first will give a blue color, and perhaps a blue precipitate, if iron is present; the latter will give a red color.

(4350) G. A. W. asks: Will you please inform me how pure bisulphite lime and sulphite lime are made? A. By acting on caustic lime with sulphurous oxide. The latter may be made by burning sulphur, or by boiling oil of vitriol and with sulphur or with powdered charcoal.

(4351) G. S. H. says: A car moves around a curve at a certain speed; the outer rail is high enough to insure safety; if the center of gravity is raised in the car by building it higher, what will be the effect? Will it add to the safety or detract from it? Will it be necessary for safety to add to the elevation of the outer rail or not? A. It will make the car more liable to be upset, and the outer rail must be raised to compensate for it.

A. M. P. asks: How can I etch on steel, as knives, etc.?—Prof. McD. asks for a table giving the atomic and equivalent weights of the elements, with their quantivalence. I have such tables, but they do not include the later elements.—B. G. T. wants receipt for lutes for retorts.—C. N. asks for a receipt for bleaching fluid.—A. G. M. asks how to make gold lace.—B. S. T. wants formulas for fluorescent liquids.—P. W. S. asks instructions for polishing the edges of leather strops.—H. H. K. asks for instructions for using salicylic acid.

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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May 3 1892,

AND EACH BEARING THAT DATE.

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