and speed as it otherwise would, but to take a lower voltage than what it takes as it is? If it can be modified, how much current would it require? A. By using larger wire the motor can be made to run with any desired current, without change of power. 2. I should also be obliged if you would give me a receipt for a small but powerful chloride of silver battery. A. Chloride of silver batteries are not advised except for special work, such as measurements. For descriptions we refer you to our SUPPLEMENT, No. 157, also SCIENTIFIC AMERICAN, No. 3, vol. 72.

(6798) A. R. O. D. says: In answers to inquries, please advise me if tobacco stems, mixed with a fertilizer, for raising garden truck, will prevent the existence of the cabbage worm. Also give a preparation, if you have one, to prevent or destroy the cabbage worm, if above is not good without injuring same. A. Answer by Entomologist United States Department of Agriculture: Your communication of recent date, transmitting a letter, has been referred to the entomologist, who reports that tobacco stems or dust from the waste of tobacco factories has long been used as a fertilizer and insecticide, having considerable value in both directions. If the cabbage worm referred to is the green cabbage worm, feeding above ground on leaves, the tobacco will be of comparatively little value, although when dusted over the cabbage as a very fine powder it will give some protection. The chief value is where incorporated with the soil against such insects as the cabbage and turnip maggots, and against these it is only a partial protection. It is a valuable repellant to various earthworms and subterranean insects in conservatories. The green cabbage worms are now commonly treated by growers with applications of arsenicals in very dilute form, usually as a powder intermixed with a large quantity of flour, as described in Farmers' Bulletin No. 19, of this department. The applications made in this way fall on the outer leaves and are usually made to the growing cabbages before the heads are mature, so that none of the poison reaches the cabbage head as marketed.

(6799) E. A. T. writes: 1. In a recent issue, A. J. H. asks through Notes and Queries the size of wire to use in winding a telephone magneto for a dynamo. I have made a dynamo in this way, winding armature with No. 18 wire. It will light a 4 candle power incandescent lamp (95 volts), and if only required for lighting the lamp, does not need a separate commutator, as it will do this work as well with alternating as direct current. What is the recipe for composition used in caps for toy pistols? A. The composition used in caps for pistols is usually fulminating mercury. 2. Which armature is best for a motor under ⅛ horse power—Gramme ring or drum armature? A. One is as good as the other. The ring armature is harder to wind. 3. Is it advisable to cast wrought iron field magnet cores in the pole pieces? A. No. 4. Is there any simpler way of making a commutator of twelve sections than that described in SUPPLEMENT, No. 600? A. We advise you, for serious work, to use the method described. For a simple commutator, see SUPPLEMENT, No. 641.

(6800) J. P. S. writes: 1. I have a battery to ring a bell which will run for about two days and then stop. It has a plate of carbon and a rod of zinc in a solution of bisulphate of mercury (3 ounces to the pint). When I looked at it, I found a gray deposit and bubbles of gas on the zinc. I would like to know what gas and what deposit are on the zinc, and how I could remedy this, as I think it stops the current. A. It is probably metallic mercury or some subsalt or oxide thereof, and hydrogen gas. Use one to two parts of salammoniac to one of the mercury salt. 2. Please give me the chemical action of the battery. A. The zinc replaces mercury in the mercury salt, forming zinc sulphate and precipitating mercury or an oxide thereof. 3. How long will the zinc last? A. It depends on how long and how much you use it. 4. Have you a formula for a jet black varnish for iron castings? A. Varnish for Iron Work.—Dissolve in about 2 pounds tar oil ½ pound asphaltum and a like quantity of pounded resin; mix hot in an iron kettle, care being taken to prevent any contact with the flame. When cold the varnish is ready for use. This varnish is for outdoor wood and iron work. 5. Also a formula for a transparent jelly or paste for skin affections. A. Glycerine for Toilet Use, Solidified.—Transparent soap, 1½ ounces; water, 6 ounces; inodorous glycerine, 36 ounces. Dissolve the soap in the water by heat, add an equal weight of glycerine. When dissolved, add the rest of the glycerine, water q. s. to make up the weight. When nearly cold, add any perfume desired. Put in glass jars. It is of a pale amber color, and is transparent. 6. A cement for uniting metals. A. For formulas for cements for metals, see "The Scientific American Cyclopedia of Receipts, Notes and Queries."

(6801) R. W. asks what amount of No. 36 wire to use on an induction coil. This coil will have a hard rubber tube 7½ inches long, 1 inch outside diameter. ¾ full inside, with hard wood heads about half an inch thick, the rubber tube being filled with soft iron wire. I wish to get as long a spark as possible with it. Will three layers No. 20 do for primary coil? Will double wrapped No. 36 do, if just put on layer above layer, without any insulation between each? How much battery do you think it will need? What will be the voltage of the secondary or spark coil? Will a condenser attached to the primary give any better results? A. We refer you to the following SUPPLEMENTS for full information on induction coils: Nos. 160, 229, and 569. It is not advisable for an amateur to undertake to make too large a one. The approximate rule is that the voltage of the primary coil multiplied by the ratio of the terms in primary and secondary (primary being divisor) gives the voltage of the secondary. The condenser is of utmost importance. A one-tenth inch spark is taken as indicating 10,000 volts potential difference.

(6802) L. F. asks: What horse power would be required to operate a dynamo to run an electroplating apparatus of 10 gallons of solution? What amperage and voltage would be required? A. No answer is possible. Everything depends on the work being done. It would be fair to allow one-tenth horse power, and the amperage and voltage must be regulated by the work being done. We can supply you with a manual on electro-plating, and in our SUPPLEMENT, Nos. 310 and 436, will be found excellent articles on the subject.

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