

Business and Personal.

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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 This is for our information and not for publication.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.

(7135) M. P. S. writes: In your issue of January 16, under the head of Science Notes, you state the coldest region on earth is the country around Werchsansk, in Siberia, where the thermometer sometimes falls below 68° Centigrade below zero (90° Fah. below zero). Are you not in error when you say 68° C. = 90° Fah.? Does not 68° C. = 154½° Fah.? The formula is 9/5 C. + 32 = Fah., or at least I was so taught. A. The article you refer to is correct. The degrees below 0° C. are minus quantities, so that the addition, being algebraic, involves an arithmetical subtraction. Those not conversant with algebra, for degrees below 0° C. may proceed as follows: If the result of the multiplication of degrees below zero Centigrade by 9/5 is (a) less than 32, subtract it from 32; if (b) greater than 32, subtract 32 from it. The result of a is to be expressed as degrees above zero Fah.; the result of b is to be expressed in degrees below zero Fah. But treated algebraically the formula is correct. Thus -68 x 9/5 = -122 2/3; adding 32 we have -122 2/3 + 32 = -90 2/3. This process gives a fraction more than 90° Fah. below zero as the equivalent of the Centigrade degrees, which corresponds with the article, except that the fraction is omitted, as of inconsiderable amount.

(7136) G. F. H. writes: 1. Is there a compound, not poisonous, which, when paper is moistened with a solution of it and a current of electricity passed through the paper, will give the same or similar result as is obtained by like treatment of paper moistened with a solution of ferro-cyanide of potassium? That is, will there be traced on the paper a permanent blue line or a distinct line of any color? A. A solution of potassium iodide acts thus. A very dilute starch solution may be added to the iodide solution to intensify the color. 2. Can paper be so treated as to become a conductor when dry, the current being of the strength of one gravity cell? If so, what is the treatment required? A. No; except by brazing or coating with black lead or some such treatment. The conducting powers of paper charged with chemicals, as used in chemical telegraphic recorders, is due to the presence of moisture.

(7137) R. G. R. asks: 1. I have a motor having a ring armature about 3 1/2 inches in diameter. The armature is wound with about No. 24, the field with about No. 10, speed 2,200 revolutions, volts 6. Now I want to convert it into a dynamo. How am I to reduce the speed? A. Do not attempt to reduce the speed, but run with large belt wheel on countershaft so as to maintain a speed of 2,000 to 3,000 revolutions per minute. You may not get much satisfaction from it, as a motor is often poorly adapted for use as a dynamo. 2. Why will not the current from an induction coil run a motor? A. It will run a special motor adapted for high tension electricity. It will not run an ordinary motor, because it produces an almost infinitesimal current of alternating and very high frequency type at enormous potential, while ordinary motors are adapted for currents of widely different character. 3. Should the above described motor run connected as a shunt? A. Yes.

(7138) A. H. C. says: Can you inform me where I can get a cement which is not soluble in alcohol and that will hold glass? A cement, for example, that would hold liquor. A. Take the best kind of glue; pour on an equal quantity of water; let it soak overnight; next morning melt it over a gentle heat, and add fine Paris white or white lead; mix well, and add a little acetic acid, carbolic acid, oil of cloves, or any other ethereal oil, to prevent putrefaction. This cement is

also adapted for flexible objects like leather. It will not withstand boiling water well, as this softens the glue.

(7139) E. G. B. asks for a recipe for making grafting wax. A. Grafting wax: 1. Pitch..... 4 oz. Resin..... 4 " Lar..... 2 " Beeswax..... 2 " Melt over a slow fire, or 2. Melt together equal quantities resin and beeswax, and add enough tallow to produce the proper consistency. Grafting wax: 3. Pine resin..... 50 parts. Tallow..... 10 " Turpentine..... 5 " Alcohol, 90 per cent..... 5 " The resin is melted in an iron vessel. The turpentine is added, next the tallow, and finally the 90 per cent alcohol. Stir the ingredients thoroughly and cool.

(7140) H. J. F. asks: 1. Can I deposit zinc upon carbon plates? If so, how and what is the process? Can you furnish me formula for above? A. Zinc can be deposited on them electrolytically. See our SUPPLEMENT, Nos. 994, price 10 cents by mail. 2. I have constructed a battery, using carbon and zinc for elements, exposing to the action of the solution 96 square inches, and obtain 8 volts for about one hour, and after that time it drops about 35 per cent per hour. Can you recommend a solution that will give longer life? I do not care as to the consumption of zinc. A. As regards your battery, if you have used good bichromate solution, no improvement can be suggested, unless it is to use larger vessels, so as to have more solution. We assume that your zincs are well amalgamated; neglect of this will make the battery very short lived. 3. How much power can I derive from 8 light dynamo used as a motor? A. The dynamo named should give over 1/2 horse power. 4. Can I not use the 8 light dynamo described in SUPPLEMENT as a motor to run a 20 foot boat and run same by battery? A. The dynamo could be so used. You should use storage batteries. 5. What is the output of dynamo in watts? A. About 50 watts. 6. What kind of battery do you recommend and how many for a two gallon electroplating apparatus? A. Eight or ten gravity batteries. See our SUPPLEMENT, No. 310, for electroplating.

(7141) H. B. asks: 1. Which is the best battery to use in electroplating, or why is the Smee or Bunsen used more extensively than the gravity? Could not the first be used? A. The high resistance of the gravity battery tells strongly against its use for electroplating. On the other hand, its great constancy is much in its favor. There are no absolute grounds in favor of any one kind of battery. Each kind has its good and bad points. 2. Would it cost more to use a gravity cell than a Smee or Bunsen, as the first has to be closed four or five hours a day, the Smee or Bunsen being used from one-half to two hours? A. The gravity cell can be run perhaps cheaper than any other. If the upper two or three inches of solution are withdrawn by a large India rubber syringe when the battery is out of action, the closing of the circuit will not be required. 3. How is the gold solution used in plating made? Also the silver? A. See our SUPPLEMENT, No. 310, price 10 cents by mail. 4. What shape and weight are the gold and silver anodes usually? A. Plates are used of area proportional to work. The weight has no effect on the action. 5. In a storage battery and on a dynamo, which is the positive and negative terminal? In charging a battery, how are the terminals connected? The negative and negative or the positive and negative? A. The purple colored plate of a storage battery is termed the positive. It corresponds to the copper or carbon plate in a primary battery. For charging connect the cells in series, positive to negative. 6. When lead is substituted for the copper in the gravity cell, does it need to be insulated where it comes through the two solutions? A. The lead plate should not come through the two solutions. It should lie at the bottom of the jar in the copper sulphate solution. A gutta percha insulated lead or copper conductor should connect with it and lead out of the battery jar.

(7142) J. McL. writes: 1. What is the difference between American wire gage and Brown & Sharpe's gage? A. They are identical. 2. If I make electric motor described in "Experimental Science" one-half size, what change would I have to make in the wire and what part of the original power would I get? A. It would give you about one twenty-fifth of the power of the larger dynamo. The sizes of wire would be determined by the voltage desired. 3. Where can I get a good description of how to make a sensitive galvanometer, not the mirror type? How can I make a tangent galvanometer without having resistance coils? A. For galvanometers we refer you to SCIENTIFIC AMERICAN, No. 12, vol. 61, also SUPPLEMENT, No. 794; price 10 cents each prepaid by mail. Resistance coils form no part of a galvanometer; they are used in connection with it to determine resistance of conductors. 4. How is the magnetic meridian found in using a tangent galvanometer? A. By the compass needle. Set the instrument so that the needle points to 0 on the scale.

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INDEX OF INVENTIONS FOR WHICH LETTERS PATENT OF THE UNITED STATES WERE GRANTED MARCH 16, 1897, AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.] Adding and registering mechanism, C. H. Little, 579,115 Adding machine typewriting attachment, G. W. Mudgett, 579,047, 579,048 Alarm. See Burglar alarm.

Table listing inventions and their patent numbers, including items like Game counter, Gas burner, Gas generator, and various mechanical devices.

