Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue

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 This is for our information and not for publication.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.

(5714) G. G. D. asks: In the simple electric motor would an H armature do, instead of the Gramme ring, if made the same size? Would the motor run a 12 foot canvas canoe? Which would be the cheapest way to run it, by plunge batteries, or by storage batteries charged with gravity batteries? How long will four cells of storage batteries run the motor until becoming exhausted. A. The H armature is very seldom used now, and will not give you good results in place named. The motor will hardly run your canoe. Storage batteries are much the cheapest. They should have at least one square foot of positive plate, and will run the motor ten hours.

(5715) F. W. D. writes: We have a room 25 feet by 20 feet by 15 feet high with four large windows, all on one of the longest sides. Through the center, longest way, runs a 20 inch belt ten feet from floor, and boxed in. At all times during winter, and at most times in summer, the electrical attraction is sufficient to raise the hair and mustache of a person standing within six feet of the belt. It has become a nuisance. Can you suggest a remedy without disturbing the belt? A. You might try covering or lining the box with tin or wire gauze and connecting this to a water pipe by a thick copper band or wire. Possibly if the lower side of the box is thus treated it will stop the trouble. A slight injection of steam into the box would tend to ameliorate the condition, but might injure the belt.

(5716) L. C. G. asks: Will you please tell me how to make a primary battery that will make a 16 candle power light? What kind of a dry battery will make a 2 candle power light? A. For 16 candle power you will need 20 volts and 1·8 amperes. The smallest battery to give this must have 80 cells and be of 11·1 ohms resistance. A plunge battery of 80 couple with plates 6 inches square should answer. For dry batteries address any of our advertisers who deal in electrical supplies. See our SUPPLEMENT, No. 157, 767, 792, and SCIENTIFIC AMERICAN, No. 20, vol. 61, and No. 2, vol. 67, for batteries of classes asked for.

(5717) A. F. K. asks: Is there any virtue in the prism lens in spectacles? A. Prismatic lenses are used in spectacles, often in combination with cylindrical surfaces. Their use is determined by the condition of the eye. We do not find the word you give, in the dictionary.

(5718) J. A. C. asks if a telegraph instrument (relay) wound to 300 ohms would be sufficient resistance to discharge small storage cells through, also if one wound to 8 or 10 ohms would do? A. These questions cannot be adequately answered without a knowledge of the size of the wire and the number of storage cells arranged in series.

(5719) J. E. H. asks: 1. What is the resistance required for a voltmeter measuring potentials varying between 5 and 120 volts? I have figured in the neighborhood of 1235. Is that correct? If right, what size wire is convenient for winding to obtain the desired resistance? A. There is no specific resistance in the case named. The size of wire is determined by its resistance. The resistance must be high enough to prevent heating. 2. An ammeter has been constructed so as to measure currents varying between 10 and 50 amperes, and it is desired, without altering anything but the gauge of wire used, to wind to measure currents varying between 5 and 25 amperes. What should the resistance and gauge of wire be? A. The conditions are not very fully expressed. As we understand it, twice as many turns should be given the coil for the lower currents. The less the resistance, the better. The new wire might be of half the cross sectional area. 3. I would like to make a magnet, the core being 5½ inches long, 4½ inches wide and 2½ inches thick. What would be the diameter of magnet when wound with 11 pounds of No. 22 single wound wire? Or what would be the thickness of the wire from core to last layer of wire? A. Almost exactly ½ inch thickness of wire, giving for magnet a cross section 5½×3½ inches. 4. I have a one horse power shunt motor which I made myself. How could I attach it to a 500 volt street car circuit? I would like to try the motor if I could connect it up in some manner so I may obtain the desired resistance. We have the Westinghouse alternate circuit here, and I see no other place to try it but on the street car circuit. A. Iron wire makes a good material for resistance. If you make good end connections, electric light carbons will answer; ⅝ carbons have a resistance of about 0·06 ohm per foot. Put in plenty of resistance and gradually reduce it, to avoid the danger of burning your armature. You should properly calculate just what resistance is needed.

(5720) F. T. L. asks: 1. Can an alternating current be used to run a common motor or one especially constructed for that purpose? A. A special motor is required. See our SUPPLEMENT, Nos. 692 and 717. 2. Can an alternating current be used for magnetizing purposes? Would the resulting poles be the same as if a continuous current were sent through the coil about the steel bar? A. It will magnetize with some uncertainty as to strength of magnet produced and utter uncertainty as to polarity. 3. Can a 500 or 600 volt and 10 ampere current be produced? A. A 10 ampere current can be produced by 600 volt potential. There is no such thing as a 600 volt current; volts are not an attribute of currents. 4. Can the position of a ship at sea be determined (by those on board) at any time of day, or must all observations be taken at noon? A. Yes; by equal altitude azimuth observations before and after noon. 5. I have heard three different pronunciations of Yosemite Valley. Will you please give me the correct pronunciation? A. Yosem'-i-te. 6. Are the words news and oats used in the singular or plural? A. News is almost invariably treated as in the singular; oats is plural.

(5721) H. S. L. says: A question was given in an examination of the pupils of the high school: Why are latitudes south colder than corresponding latitudes north? A. The southern hemisphere has a predominance of ocean surface, which retains the solar heat to a much larger extent than the land. The northern hemisphere, having a much larger proportion of land, retains the solar heat at its surface during the day and radiates it at night. The great ice-covered Antarctic continent has also a cooling influence over the southern hemisphere, while the Arctic region has a large area of water into which the warm gulf stream is constantly pouring the warm waters of the equatorial region, thus carrying the mean thermal equator to the north of the terrestrial equator, with a corresponding difference of temperatures in the two hemispheres.

(5722) B. M. asks: Which rail do the cars of a passenger train throw the most strain upon going round a curve, also which rail does the last car of a long freight train throw the most strain upon rounding a curve? A. The pressure of a train against the rails on a curve depends upon the conditions of speed and pull or push of the engine. If a train runs around a curve by its own momentum, the pressure is against the outer rail. If it is pulled around by the engine the pressure is against the inside rail. The last car always, under ordinary speed, presses against the outer rail. The raising of the outer rail partially counteracts the centrifugal tendency of the cars to crowd against the outer rail at the assigned speed for rounding curves.

(5723) V. A. W. writes: 1. In the book entitled "Electric Toy Making," by Sloane, under induction coils, on page 94, it is stated that the secondary coil can be wound by putting a circular piece of cardboard half an inch from the end, winding this section full, shifting the paper up one-half inch, winding this section, and so on for the entire length of the coil. Would it not be better to use vulcanite in place of the cardboard, and leave the vulcanite in? A. Cardboard will answer every purpose. It is only requisite to hold the wire while winding. 2. Is it essential or better to shellac each layer of the secondary coil if the wire is silk-covered? A. It is better to shellac it, or to paraffin it thoroughly. 3. Cannot the secondary coil be separated from the primary coil by a vulcanite tubing? A. Yes. 4. Is the platinum at the contact breaker essential or better? A. The platinum is used to prevent oxidation of the contact points. It should be used.

(5724) F. A. L. asks if there is a solution that will make rope fireproof or partially so, and that will not impair the strength. If there is such a solution that you know, of what is it composed? A. There are several chemicals for fireproofing cordage to an extent that they will not burst into flame by a momentary contact. They may be applied by drawing the rope slowly through a trough containing the warm mixture and drying. Borax 6 pounds, sulphate of magnesia 4 pounds, 6 gallons warm water. Also alum 6 pounds, borax 2 pounds, tungstate of soda 1 pound, dextrine dissolved in soap lye 1 pound, with 8 gallons of water, used as above.

(5725) H. J. P. asks: 1. Is it known how or where the electric current passes along a wire? Does it move on the surface, or among the atoms of metal? A. The most acceptable theory is perhaps that the electric wave front has a path opened for it through the ether by the wire, and hence moves forward without oscillation or ether straining. The impulses are often assumed to be given through the ether surrounding the wire, and to be given at all points along its length. 2. Can there be such a condition as motion without something moves? A. No. 3. How many years will the best luminous paint or preparation act effectively if inclosed in an air-tight glass bulb and exposed to sunlight every day? A. We have no exact data on this point. It preserves its quality for a very long period.

(5726) W. C. W. asks: 1. What per cent of the power of electricity will be lost in transmitting it 10 miles? I mean when generated to run machinery with. A. The loss of power in the transmission of electric energy is great or small as desired. A compromise between extreme sizes of conductors and extreme ranges of voltage is adopted, giving the most economical results as regards capitalization, etc. For a small loss the conductor required may be too large or voltage too high. 2. Say for instance, if a well 40 feet deep will furnish 2,000 gallons water per minute, and this water be piped to a distance of 10 miles, attaining a fall of 140 feet. Will this afford enough power, with a good water wheel, to generate enough electricity, when transmitted back to well 10 miles, to raise the 2,000 gallons per minute to the top, 40 feet? A. Probably yes. 3. What horse power will the 2,000 gallons of water, with the 140 feet fall, distance 10 miles, produce? A. 45 horse power net. 4. What size pipe should be used? A. Twenty-four inches diameter. 5. What size wheel? A. Five foot Pelton wheel. A full plan of ground and more elaborate study would be required before undertaking to erect a plant.

(5727) W. A. M. asks: 1. Will common soft machinery casting do as well for fields of eight light dynamo as the soft gray iron named in SUPPLEMENT, No. 600? A. Yes. 2. Also how are ampere turns calculated, or what is an ampere turn? A. An ampere turn is a current of one ampere passing in one complete turn. Thus a current of ten amperes, carried ten times around a magnet core, represents one hundred ampere turns. Calculations are given in Sloane's "Arithmetic of Electricity," $1 by mail.

(5728) G. B. B. asks: 1. Will a Leclanche battery light an incandescent lamp? If so, how many cells will it require to run a one candle power? A. Five or six Leclanche cells would maintain it for a short time only. 2. How long will a bichromate plunge battery last? Dimensions of a cell being 4 inches high, 2½ inches diameter. A. For a one candle lamp three or four would be required and might last half an hour or an hour.

(5729) J. F. asks: I have one-sixth horse power motor made by the Taylor Battery Company, 39 Dey Street, New York. Will you please tell me if I can change it into a dynamo without much trouble? A. No change is needed, except to vary the winding, if the voltage does not suit. Try rapid rotation, to see what current it gives. Small motors are apt not to be properly proportioned to form good dynamos.

(5730) H. L. W. asks if there is any paint that will stand the solution used in the plunge battery, or where can it be had? A. 4 parts resin, 1 part gutta percha, a little boiled linseed oil. Melt together and apply hot.

(5731) J. H. L. asks how permanent magnets are magnetized. A. *a*. By stroking with another magnet under proper restrictions. The methods are given in works on physics. *b*. By surrounding with a coil of wire and passing a strong current of electricity through it. There are many modifications of both methods.

(5732) V. G. A. asks whether lead can be plated on aluminum. Also please let me know where I can find information regarding same. A. Use

Acetate of lead	0 17 oz.
Acetic acid	0·17 "
Water	1 quart.

Use a weak current and scratch brush during deposition.

(5733) A. E. McC. asks how many layers each of Nos. 14, 16, and 18 double cotton-covered copper magnet wire go to the inch. A. 16, 20 and 25 layers respectively of bare wire laid close.

(5734) A. S.—We know of no manufacturer making automatic-cut outs for windmills, but probably any of the dealers in electrical supplies could have one made to order for you.

(5735) A. S. asks for a liquid which will remove oil and grease from brass, and which is not so inflammable as benzine. A. A weak solution of sal-soda in water at boiling heat is the quickest method of removing oil and grease from brass work. If the oil and grease is dirty, as from the polishing process, the water should boil to clean the brass quickly.

(5736) H. K. asks: 1. In a description of the Edison-Lalande battery, one of the elements is referred to as oxide plates. What is the meaning of that? A. Consolidated or compressed oxide of copper. 2. "Type K" has 300 ampere hours capacity. What is the approximate cost of a cell of this capacity? A. Address any of our advertisers dealing in electrical goods.

(5737) W. J. S., W. S. H., W. P. J. D. and others say: Will you kindly send me a receipt for tanning skins for fur rugs and mats, such as coon, fox, sheep, deer, etc. A. To prepare sheepskins for mats: Make a strong lather with hot water and let it stand till cold, wash the skin in it, carefully squeezing out all the dirt from the wool, wash it in cold water until all the soap is taken out. Dissolve 1 pound each of salt and alum in 2 gallons of hot water, and put the skin into a tub sufficient to cover it, let it soak for twelve hours, and bang it over a pole to drain. When well drained stretch it carefully on a board to dry, and stretch several times while drying. Before it is quite dry, sprinkle on flesh side 1 ounce each of finely pulverized alum and saltpeter, rubbing it in well. Try if the wool be firm on the skin. If not, let it remain a day or two, then rub again with alum, fold the flesh sides together and bang in the shade for two or three days, turning them over each day till quite dry. Scrape the flesh side with a blunt knife and rub it with pumice or rotten stone.

(5738) J. M. D. asks: What is the theory and what has been determined by experiment regarding the practicability of keeping a body submerged at a certain distance below the surface of water, and of raising or lowering it at will, independently of any force except what may be contained within itself, such contained force to be human beings, and to operate by the admission or discharge of water? A. The practicability of floating a hollow body containing air as a counterbalance is a very difficult one. The difference in the density of water at various depths, owing to its almost non-compressibility, that any body just floating under the surface needs but a very small addition to its weight to sink it to the bottom. The operation of adjusting the depth of the body by pumping water into and out of the floating body is a delicate one, and has been a serious drawback to submarine navigation.

Replies to Enquiries.

The following replies relate to enquiries published in the SCIENTIFIC AMERICAN, and to the numbers therein.

(5598) In answers to correspondents No. 5598, you recommend the soaking of a camera film in glycerine mixture, to obviate tendency to curl. The following is quite as effective, and less troublesome: Put a good number of films in a printing frame, and put on the top, making it flatten them well. Then expose frame to strong sunlight, or put in a hot place, until it is as hot as the hand can bear, after cooling still in the frame, the negatives will be found to have very little tendency to curl. Of course, care must be taken that they shall not get too hot.—ALEX. S. GIBSON.

(5598) I would suggest to A. L. W., query No. 5598, that if he would varnish his film negatives, he would have no trouble from curling. This method has been very satisfactory to me.—H. H. W.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

January 16, 1894,

AND EACH BEARING THAT DATE.

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

Abdominal supporter, E. F. De Lashmutt	512,814
Advertising device, portable, P. E. Bergeman	512,937
Air cooling apparatus, J. Murray	512,987
Air for power purposes, apparatus for heating compressed, R. A. Parke	513,053
Ale drawing device, J. Farmer	512,951
Alkali salts, making, H. S. Blackmore	513,001
Aluminum, manufacturing, W. E. Case	512,801, 512,802
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